

ADOPTION AND IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE (AI) TOOLS FOR BUSINESS EDUCATION DELIVERY IN TERTIARY INSTITUTIONS IN BAYELSA STATE

Dr. Ndiomu Kemebaradikumo Kelvin (MABEN)

kelvinon2016@gmail.com

08035407960

Department of Business Education

Isaac Jasper College of Education Sagbama Bayelsa State.

Dr. AkeleEgberi Francis (MABEN)

frankele3@gmail.com

09016338945/08061690401

Department of Business Education

Isaac Jasper College of Education Sagbama Bayelsa State.

Alabi Ebifakumor Blessing

fakumork@gmail.com

0803672251

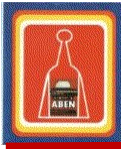
Department of Business Education

Isaac Jasper College of Education Sagbama Bayelsa State.

Abstract

Given the rapidly changing nature of the business industries occasioned by technological advancement, business education delivery method needs to change as well. The traditional business education method as we have it, may not foster the much needed creativity and innovation to adapt to new challenges and opportunities in the business world. It is therefore essential to understand how AI tools can be effectively leveraged in business education to provide students with the skills and knowledge they need to succeed. This study therefore seeks to validate empirically, while investigating the adoption and implementation of artificial intelligence tools in enhancing business education delivery in tertiary institutions in Bayelsa State. The study adopts quantitative research design using a survey method. The population of the study was drawn from all students in the department of business education from the three tertiary institutions in Bayelsa State. Respondents from the various institutions were surveyed through questionnaire administration. The reliability of the instrument was tested using Cronbach Alpha and a reliability coefficient of 0.91 was obtained. Data analysis was done using descriptive statistics such as mean and standard deviation while inferential statistics was done using z-test statistics at 0.05 level of significance. The findings from the analysis result reveal no significant difference in the mean rating of respondents on the adoption and implementation AI-powered chatbots, virtual reality, and content recommendation engine in enhancing business education delivery in tertiary institutions in Bayelsa State. It was concluded that Artificial Intelligent tools when adopted and implemented will enhance business education delivery in tertiary institutions in Bayelsa State to a very high extent. The study therefore recommends that tertiary institutions should integrate AI tools like chatbots, virtual reality into their business education delivery, taking advantage of the personalized, interactive, and effective learning experiences that these tools can provide.

Keywords: Artificial Intelligence, Artificial Intelligence (AI) Tools, Business Education Delivery, Business Graduates, Technological Advancement.



Introduction

The primary goal of business education is to prepare learners with the essential competencies, practical skills, and ethical values required to thrive in the business world and contribute meaningfully to economic development. It covers foundational disciplines like finance, accounting, marketing, management, and information systems. Students are expected to acquire not only theoretical knowledge but also practical capabilities in communication, teamwork, critical thinking, and decision-making. Furthermore, business education encourages the development of ethical standards, a sense of social responsibility, and sustainable practices aimed at creating a positive societal impact. It fosters innovation and creative thinking by equipping students to recognize and seize emerging market opportunities (Darrell & Seifert, 2020).

However, the continuous evolution of the business sector—driven by rapid technological changes—necessitates a transformation in the methods used to deliver business education. Rajaratnam (2024) argues that if business education fails to adapt, it risks producing graduates who lack the competencies required in modern workplaces. High-quality business education should make individuals competitive in both employment and entrepreneurship. This underscores the need to explore how artificial intelligence (AI) can be integrated into business education to better equip students for the future.

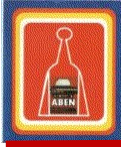
AI is increasingly influencing educational methods, transforming how learners acquire and apply knowledge. According to Chang, Pan, Manikandan, and Ramesh (2022), AI refers to machines or systems capable of executing tasks typically associated with human intelligence, such as interpreting speech, understanding language, making decisions, and learning from data. Through sophisticated algorithms, AI systems can analyze vast datasets, identify trends, and enhance their performance over time.

As digital technologies become more prevalent, business education is experiencing a shift. Tools like AI chatbots, virtual simulations, and intelligent content delivery platforms are being incorporated into teaching and learning (Brook, 2021). These tools promote personalized instruction and engagement, although their implementation presents challenges. Institutions can address these by offering proper training, investing in accessible technologies, and combining AI tools with traditional human-led teaching. The key lies in maintaining a balance between technology and the human experience, ensuring that learners still benefit from personalized, empathetic instruction.

Several innovative AI trends are transforming education. **Adaptive learning systems**, for example, tailor content to individual student abilities, ensuring that learners receive material aligned with their skill levels. AI-powered virtual assistants provide constant support, answering queries and offering guidance in real time. These tools adapt to individual learning styles and recommend customized resources. In addition, AI facilitates teamwork by analyzing students' strengths and matching them into effective collaborative groups.

As AI technology advances, it will play an even greater role in shaping business education. Institutions that actively adopt these innovations will be better prepared to develop future-ready graduates. AI focuses on enabling machines to perform tasks requiring cognitive functions such as problem-solving, pattern recognition, and decision-making. Applications like ChatGPT, Google Bard, Midjourney, and AI-enhanced platforms like Canva are becoming mainstream, reshaping communication, learning, and industry practices. As such, integrating AI literacy into academic programs is critical not only for students' career readiness but also for workforce development (Hannan & Shuguang, 2021; Butulis, 2023).

Equipping students with AI knowledge can bridge inequality gaps, build a more inclusive talent pipeline, and encourage creativity in AI innovation. Chaudhary (2017) notes that the use of AI in



classrooms benefits both teachers and students by enhancing interaction and creating collaborative environments. AI enhances precision and speed in learning and highlights the need for students to undergo relevant training to build their competence.

Introducing AI into higher education, particularly in business programs, can significantly improve how students learn, how learning outcomes are measured, and how knowledge is applied. AI applications include customizing educational content, automating administrative tasks like grading, and encouraging collaboration through shared learning platforms. Chatbots, for instance, can simulate business situations, assist students at any time, and provide immediate feedback. This allows for a more engaging and personalized learning experience (Charles-Davies & Pi, 2024).

Similarly, Gipps (2018) highlights that virtual reality can immerse students in lifelike business scenarios, allowing them to practice essential skills such as negotiation and customer interaction in a controlled environment. Additionally, AI-based recommendation systems can suggest educational materials—like videos or articles—based on a learner's interests and preferences, making learning more dynamic and exploratory.

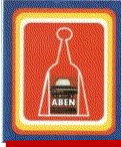
By integrating AI into business education, we can enhance the delivery of content and open new pathways for educational growth. Today's business learners are tomorrow's leaders, and preparing them for an evolving world is imperative. AI tools foster adaptability and a culture of continuous innovation. Nonetheless, educators and instructional designers remain central to this transformation. Educational institutions must guide the implementation of AI to preserve their instructional integrity. AI should be seen not as a replacement but as a supplement to human educators (Nicolaas, 2024). The most effective learning environments are those that harmonize advanced technology with human insight.

Although AI adoption in business education is gaining traction, there is still limited empirical research on its full impact. This presents a gap that future studies can address. Therefore, this study aims to examine how the use of AI tools can improve business education delivery in tertiary institutions across Bayelsa State.

Statement of the Problem

Although AI tools are becoming increasingly prominent in the delivery of business education, a significant number of educators and institutional leaders remain cautious about their full-scale adoption. This hesitation often stems from unfamiliarity with integrating AI into instructional methods, limited awareness of the potential advantages, and the absence of clearly defined guidelines or best practices for their implementation. Consequently, students who graduate without exposure to AI competencies may struggle to keep pace with evolving workplace technologies, which could hinder their career progression. Zouhaier (2023) highlights that lacking proficiency in AI may place graduates at a competitive disadvantage, as many businesses are now incorporating AI to streamline operations and foster innovation. Without foundational knowledge of AI tools, these individuals may also find it challenging to keep up with industry trends and practices, further widening the skills gap and making it harder for organizations to attract a well-rounded, diverse workforce in an AI-centric economy.

Given that future professionals are expected to engage with generative AI tools in the workplace, higher education institutions provide an ideal setting to develop and refine these competencies. With appropriate guidance from educators, students can gain hands-on experience with AI technologies, learn to use them responsibly, and critically evaluate their capabilities and limitations. According to Anthony Hié and Claire Thouary (2023), it is essential that instructors equip learners with the necessary skills to navigate AI tools effectively in both



personal and professional contexts. By integrating AI education into curricula, tertiary institutions can help close the gap between academic preparation and industry expectations, ensuring graduates are equipped to thrive in contemporary work environments.

Furthermore, as businesses continue to evolve alongside technological innovation, it is important to emphasize that AI should not be seen as a replacement for human intelligence, but as a complementary tool that enhances human abilities. Embedding AI into business education can lead to more engaging, customized, and impactful learning experiences, ultimately raising the standard of education and preparing learners for success in a fast-changing global economy. It is within this context that the current study finds its relevance and justification.

Purpose of the Study

The main objective of the study is to investigate the extent to which an adoption and implementation of Artificial Intelligence (AI) tools can enhance business education delivery in Tertiary Institutions in Bayelsa State. The study is guided by the following specific objectives:

1. To establish the extent to which AI-powered chatbots can enhance business education delivery in Tertiary Institutions in Bayelsa State.
2. To establish the extent to which AI-powered virtual reality can enhance business education delivery in Tertiary Institutions in Bayelsa State.
3. To establish the extent to which AI-powered content recommendation engine can enhance business education delivery in tertiary institutions in Bayelsa State.

Research Questions

The following research questions are developed to guide this study:

1. To what extent does AI-powered chatbots enhance business education delivery in tertiary institutions in Bayelsa State?
2. To what extent does AI-powered virtual reality enhance business education delivery in tertiary institutions in Bayelsa State?
3. To what extent does AI-powered content recommendation engine enhance business education delivery in tertiary institutions in Bayelsa State?

Research Hypotheses

The following hypotheses are formulated to guide the study:

Ho₁: There is no significant difference in the mean rating of male and female students on the adoption and implementation of AI-powered chatbots in enhancing business education delivery in tertiary institutions in Bayelsa State.

Ho₂: There is no significant difference in the mean rating of students based on different age background on the adoption and implementation of AI-powered virtual reality in enhance business education delivery in tertiary institutions in Bayelsa State.

Ho₃: There is no significant difference in the mean rating of students based on their status on the adoption and implementation AI-powered content recommendation engine in enhancing business education delivery in tertiary institutions in Bayelsa State.

Popenici and Kerr, as referenced in Nicolaas (2024), describe artificial intelligence (AI) as the development of computer systems capable of performing tasks that normally require human cognitive abilities such as reasoning, logic, and decision-making. AI draws on computational strategies modeled after the way humans perceive, learn, and act through their nervous systems and physical interactions. Broadly, AI is understood as the replication of human thought processes by machines, particularly computers. In this study, AI is defined as "computing

systems capable of performing human-like functions such as learning, adapting, synthesizing, self-correcting, and utilizing data for complex analytical tasks."

As a rapidly evolving area in education, AI holds great promise for enhancing teaching and learning in higher institutions. According to the Horizon Study 2020 report, AI is listed among six emerging technologies with the potential to make a major impact on higher education globally. The report identifies AI as a key technological advancement that is shaping the future of education worldwide (Hutson et al., 2022).

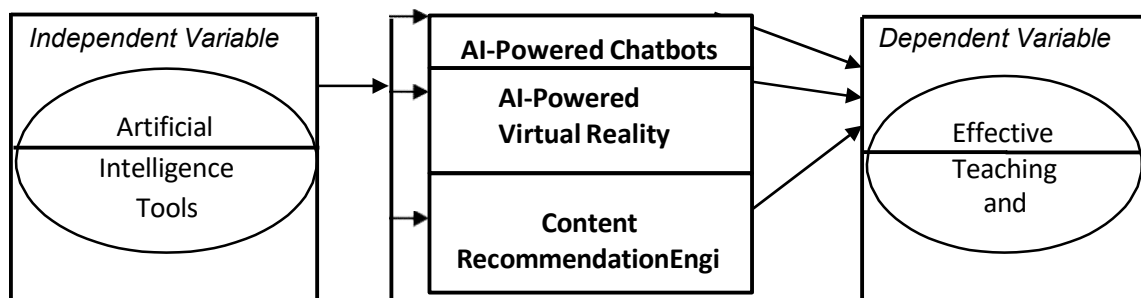
Fernández, Fernández, and Aburto (2019) emphasize that the integration of AI and modern technological tools can enrich educational experiences for both instructors and learners. These technologies provide valuable insights to educators and administrators regarding best practices and the scope of AI in achieving academic excellence. AI enhances the learning process by enabling tailored feedback, integrating human interaction with information and communication technologies, and raising overall education quality. Moreover, AI fosters the development of collaborative learning environments that benefit all stakeholders in the academic community.

The use of AI in higher education presents notable advantages for both educators and students. It supports more adaptable and accessible learning models, enabling students to learn without the usual constraints of time and location. This flexibility has allowed universities globally to accommodate larger student populations. Despite the potential financial investment required for AI integration, the long-term cost-effectiveness becomes evident when compared to the labor-intensive nature of traditional educational methods.

While AI has been successfully deployed in developed countries, developing nations remain at an early phase of adoption. Various challenges hinder the full implementation of AI in these regions, including underdeveloped infrastructure, limited access to reliable information, institutional resistance, inadequate funding, and a general lack of digital literacy and technical skills. These barriers underscore the need for further investigation into how AI can be effectively adopted and implemented in higher education, particularly within the context of developing countries. Therefore, this study aims to explore and address the existing gaps in AI adoption in tertiary institutions.

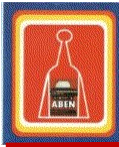
Artificial Intelligence (AI) Tools for Teaching and Learning

Dimensions



Source: Zhao, X., Xiao, Y., Tao, X., & Long, Y. (2021); Charles-Davies, S. & Pi, Al. (2023).

Types of AI Tools for Teaching and Learning in Education



The transformation of business education has accelerated with the rise of digital technologies, particularly through the adoption of artificial intelligence (AI) tools. Modern educational institutions are increasingly utilizing AI innovations like chatbots, virtual reality (VR), and content recommendation engines to facilitate effective and flexible learning. These technologies provide around-the-clock access to instructional resources, allowing students to learn at their own pace and according to their individual needs. Institutions also benefit from these tools by becoming more responsive and adaptive in their educational delivery. On the instructional side, educators are now using AI to generate course materials, write programming scripts, improve content accessibility, enhance writing workflows, and detect academic misconduct.

Chatbots

Chatbots, powered by AI, serve as interactive conversational agents designed to offer learners a more customized educational experience. They are capable of responding to student inquiries, simulating real-life scenarios, and guiding learners through business concepts in ways that traditional methods might not offer. Chatbots operate continuously, making them valuable for learners requiring flexible assistance at any time. Lourenço and Jabbour (2020) assert that chatbots can simulate customer service interactions, enabling students to develop communication and problem-solving skills. By embedding industry-specific knowledge into these systems, chatbots can provide immediate and relevant feedback. Their uses are diverse, ranging from tutoring and assignment support to role-playing complex business negotiations or sales discussions. As Sharma (2023) notes, students who face challenges with conventional learning approaches may benefit significantly from the interactivity and personalization chatbots offer.

Virtual Reality (VR)

Virtual reality introduces students to immersive, simulated environments that mirror real-world business settings. This technology allows learners to apply theoretical knowledge through hands-on experiences in contexts such as marketing simulations, product launches, and trade events. It also provides global insights by replicating marketing strategies across diverse cultural and geographical environments. As Zhang and Chan (2021) explain, VR enables students to build essential skills—such as customer service, negotiation, and salesmanship—within realistic and interactive simulations. This learning approach deepens students' understanding and prepares them for real business challenges.

Content Recommendation Engines

Content recommendation engines use AI algorithms to analyze student preferences, learning behaviors, and demographic data to provide tailored educational resources. These tools recommend relevant materials such as academic papers, videos, podcasts, and blog posts that align with students' interests and knowledge levels. According to Duyar and Burić (2019), these engines can support learners in tracking industry trends and enriching their understanding of complex marketing theories. They are particularly effective in online and self-paced courses, where students independently navigate their educational journeys. By adapting to learners' evolving needs and interests, content recommendation engines promote continuous and autonomous learning (Elsayed & Elrasheedy, 2020).

The Role of AI in Delivering Business Education

AI plays a critical role in enhancing the delivery of business education in tertiary institutions. Its contributions include the following:



Personalizing learning by adapting content to individual student profiles, interests, and learning styles.

Automating routine instructional tasks, thus allowing educators to focus on mentorship and student engagement.

Providing instant feedback and progress assessments to identify learning gaps.

Supporting dynamic case study simulations that reflect changing business conditions.

Enhancing collaborative project management through tools that assist in task assignment and progress tracking.

Replicating real-world business experiences like product launches and market strategy development.

Delivering content through AI-driven chatbots, virtual assistants, and augmented reality applications.

Developing personalized learning paths to cater to each student's unique academic needs.

Assisting students in conducting market analysis, interpreting customer behavior, and creating strategic marketing plans (Charles-Davies & Pi, 2023).

1.

Implications for Business Students Without AI Competencies

The absence of AI knowledge and skills in business graduates can have far-reaching consequences. Ahmed, Alqahtani, and Mokhtar (2021) highlight several implications:

Graduates may be less competitive in the job market, especially as AI becomes integral to business operations.

They might struggle to adapt to industry developments and emerging technologies.

Inability to embrace evolving workflows could hinder career progression.

Lower salary prospects may result from limited technical capabilities in AI.

Opportunities to contribute to innovative, AI-driven projects may be inaccessible.

A lack of AI skills can cause their professional relevance to diminish over time.

These limitations can reduce employability and impact self-confidence.

Graduates may encounter collaboration difficulties in AI-centric teams.

They might miss critical opportunities for innovation and organizational growth.

The Concept and Importance of Business Education

Business education serves as a foundational component of general education, aimed at instilling business acumen for individual and national progress. It encompasses the teaching of core business principles, theories, and practices. According to Abdulkadir (2019), a distinguishing feature of business education is that it empowers individuals to become self-reliant, either as entrepreneurs or employers. It supports career readiness, entrepreneurial training, and practical exposure to the office and vocational environments. Ubulom (2012) characterizes business education as an academic discipline offered at universities and colleges, designed to teach learners how to become productive citizens through skill development and business knowledge acquisition.

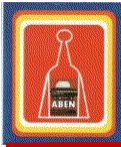
Son, Kim, and Kim (2019) outline several objectives of business education:

To expose all students to the opportunities and career paths within the business world.

To equip students with critical thinking skills for evaluating products and services.

To develop an informed understanding of diverse business occupations.

To build practical business competencies for personal and professional use.



To prepare students for employment or further studies in business fields.

To support training of future business educators.

In essence, business education equips individuals with both theoretical insight and practical skills needed for success in modern society. Erin and Shuguang (2021) stress that it helps cultivate a new generation of capable, responsible, and adaptive citizens prepared for the challenges of a dynamic global economy.

Methodology

This study employed a descriptive research design using a survey approach. According to Gall (as cited in Ojera, 2016), descriptive survey research aims to collect accurate and relevant data regarding the present condition of a subject or phenomenon, with the goal of making valid inferences where applicable.

The study targeted a population of 171 students drawn from the three tertiary institutions in Bayelsa State that offer business education programs. Due to the relatively small size of the population, no sampling technique was applied; the entire population was used as the sample for the study.

The primary data collection instrument was a structured questionnaire segmented into two main parts: one focusing on the demographic profile of the respondents, and the other on the use and integration of artificial intelligence (AI) tools in business education delivery. The questionnaire items were developed based on theoretical constructs and existing literature relevant to the study. In total, the instrument comprised 18 items, and was titled:

Adoption and Implementation of Artificial Intelligence (AI) Tools for Business Education Delivery in Tertiary Institutions in Bayelsa State Questionnaire (AIOAITFBEDTIBSQ).

A four-point Likert scale was utilized for rating responses:

Very High Extent (VHE) = 4

High Extent (HE) = 3

Low Extent (LE) = 2

Very Low Extent (VLE) = 1

A benchmark mean score of 2.5 was adopted for interpreting responses; values below 2.5 indicated low significance, while scores of 2.5 or higher were considered significant.

To ensure content validity and clarity, the questionnaire was pre-tested with 10 business education students from Rivers State University. Their feedback was instrumental in refining and improving the final version of the instrument.

Out of the total distributed questionnaires, 167 copies were validly returned, resulting in a response rate of 98%, which formed the basis for data analysis.

To ascertain the reliability of the instrument, Cronbach's alpha was computed, yielding a reliability coefficient of 0.82. This value exceeds the acceptable threshold of 0.70, as recommended by Hatcher (1994, cited in Amadi & Wali, 2017), indicating strong internal consistency.

For data analysis, mean and standard deviation were used to address the three research questions. In testing the hypotheses, the z-test statistical method was applied at a 0.05 level of significance.

Research Question 1

To what extent does AI-powered chatbots enhance business education delivery in tertiary institutions in Bayelsa State?

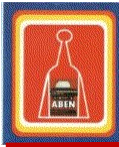


Table 1: Computation of male and female responses on AI-powered chatbots in enhancing business education delivery in tertiary institutions in Bayelsa State. F=102; M=65. (N=167).

N	Items	Females			Males		
		$\bar{x}_1$	sd_1	Remark	$\bar{x}_2$	sd_2	Remark
1	I think there is a lot of potential for AI-powered chatbots to significantly improve teaching and learning in tertiary education	.76	0.69	VHE	3.42	0.60	HE
2	Chatbots tools facilitate collaborative learning by enabling students to work together on projects and share resources in real time.	3.05	0.76	HE	3.10	0.77	HE
3	It provides personalized learning experiences, answer student questions, and even simulate real-world scenarios for students	3.33	0.58	HE	3.40	0.60	HE
4	Chatbots allows students to ask questions and receive immediate, personalized feedback on their business strategies and decisions	3.75	0.69	HE	3.54	0.68	HE
5	Chatbot technologies in teaching and learning can encourages more flexible learning solutions for students without any limitation.	3.30	0.58	HE	2.97	0.49	HE
6	Chatbots can help teachers and students gain more educational experience that are necessary to achieving excellence.	3.21	0.80	HE	3.15	0.79	HE
Grand Mean		3.40	0.68	HE	3.26	0.66	HE

Source: Field Survey, 2024

Analysis in Table 1 above reveal the extent AI-powered chatbots enhance business education delivery in tertiary institutions in Bayelsa State. From the analysis so far both male and female respondents agreed to a high extent the influence of chatbots in teaching and learning with a mean score of 3.40 and 3.26 respectively. The respondents also affirmed that chatbots tools can facilitate collaborative learning by enabling students to work together on projects and share resources in real time.

Research Question 2

To what extent does AI-powered virtual reality enhance business education delivery in tertiary institutions in Bayelsa State?

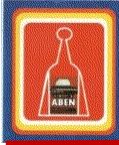


Table 2: Computation of respondent responses on AI-powered virtual reality in enhancing business education delivery in tertiary institutions in Bayelsa State based on age difference. 18-25=111; 26-33=56. (N=167).

N	Items	18-25years			26-33years		
		$\bar{x}_1$	sd_1	Remark	$\bar{x}_2$	sd_2	Remark
1	Virtual reality is used to develop learning environments and promote collaborative learning, which benefits both students and teachers	3.70	0.80	VHE	3.37	0.84	HE
2	The use of virtual reality provides a more realistic learning experience by simulating business environments and scenarios.	3.76	0.69	VHE	3.22	0.55	HE
3	Is used to create simulated business environments, where students can practice skills and apply their knowledge in a realistic setting.	2.96	0.69	HE	3.61	0.55	VHE
4	It used to create business simulations in different cultural and geographical contexts, giving students a more global perspective.	3.85	0.76	VHE	3.23	0.81	HE
5	Virtual reality can help students apply their knowledge in a simulated environment that closely resembles real-world situations.	3.35	0.84	HE	3.52	0.83	VHE
6	It provides students with feedback on their learning that is tailored to their needs, and improves the standard of the educational process.	3.68	0.83	VHE	3.76	0.87	VHE
Grand Mean		3.55	0.77	VHE	3.45	0.74	HE

Source: Field Survey, 2024

Analysis in Table 2 above reveal the extent AI-powered virtual reality enhances business education delivery in tertiary institutions in Bayelsa State. From the analysis from respondents from different age group, it was agreed to a very high extent that AI-powered virtual reality positively influence teaching and learning with a mean score of 3.55 and 3.45 respectively. The respondents also agreed that the use of virtual reality will provide a more realistic learning experience by simulating business environments and scenarios.

Research Question 3

To what extent does AI-powered content recommendation engine enhance business education delivery in tertiary institutions in Bayelsa State?

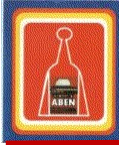


Table 3: Computation of respondents' responses on AI-powered content recommendation engine in enhancing business education delivery in tertiary institutions in Bayelsa State. S=114; M=53. (N=167).

N	Items	Single			Married		
		$\bar{x}_1$	sd_1	Remark	$\bar{x}_2$	sd_2	Remark
1	Content recommendation engine can analyze and recommend relevant business education content, including videos, articles, and other resources	3.35	0.59	HE	3.57	0.59	VHE
2	It can promote innovation and creativity in business education by enabling students to explore new ways of thinking and problem-solving.	3.47	0.54	HE	3.11	0.53	HE
3	AI-powered content recommendation engine can be used to create simulated scenarios that allow students to make real-time decisions in response to changing market conditions	3.70	0.68	VHE	3.58	0.64	VHE
4	It can provide real-time feedback and assessment, allowing educators to better understand how students are progressing and where they may need additional support.	3.84	0.71	VHE	3.33	0.41	HE
5	By providing personalized recommendations, the content recommendation engine can help students explore new topics, discover new resources, and deepen their understanding of business concepts	3.87	0.73	VHE	3.80	0.70	VHE
6	The content recommendation engine can help students explore new topics and expand their knowledge base.	3.55	0.79	VHE	3.25	0.61	HE
Grand Mean		3.63	0.67	VHE	3.44	0.58	HE

Source: Field Survey, 2024

Analysis in Table 3 above reveal the extent AI-powered content recommendation engine enhances business education delivery in tertiary institutions in Bayelsa State. From the analysis of respondents (single and married), it was agreed to a very high extent that AI-powered content recommendation engine positively influence teaching and learning with a mean score of 3.63 and 3.44 respectively. The respondents also agreed that AI-powered content recommendation engine can be used to create simulated scenarios that allow students to make real-time decisions in response to changing market conditions.

Hypothesis 1

There is no significant difference in the mean rating of male and female respondents on the adoption and implementation of AI-powered chatbots in enhancing business education delivery in tertiary institutions in Bayelsa State.

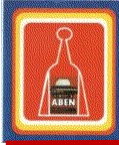


Table 4: Computation of no significant difference in the mean rating of male and female respondents on the adoption and implementation AI-powered chatbots in enhancing business education delivery in tertiary institutions in Bayelsa State.

Responses	n	Mean	SD	z-cal	α	Df	z-crit	Dec.
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Gender χ (0.05)								
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Female	102	3.400	.68					Accept
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Patients	65	3.260	.66	1.270	.05	165	1.96	H ₀₁
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Source: Field survey, 2024

As shown in table 4, the z-calculated value of 1.27 is less than the z-critical value of 1.96 at 165 degree of freedom and 0.05 level of significance. The researcher accepts the null hypothesis. Based on the hypothesis testing, the researcher concludes that there is no significant difference in the mean rating of male and female respondents on the adoption and implementation of AI-powered chatbots in enhancing business education delivery in tertiary institutions in Bayelsa State.

Hypothesis 2

There is no significant difference in the mean rating of respondent based on different age background on the adoption and implementation of AI-powered virtual reality in enhance business education delivery in tertiary institutions in Bayelsa State.

Table 5: Computation of no significance Difference in the mean rating of respondent based on different age background on the adoption and implementation of AI-powered virtual reality in enhance business education delivery in tertiary institutions in Bayelsa State.

Responses	n	Mean	SD	z-cal	α	Df	z-crit	Dec.
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Age Bracket χ (0.05)								
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18-25yrs	11	13.550	.77					Accept
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26-33yrs	56	3.45	0.740	.830	.05	165	1.96	H ₀₂
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Source: Field survey, 2024

As shown in Table 5, the z-calculated value of 0.83 is less than the z-critical value of 1.96 at 165 degree of freedom and 0.05 level of significance. The researcher accepts the null hypothesis and reject the alternative hypothesis. Based on the hypothesis testing, the researcher concludes that there is no significant difference in the mean rating of respondent based on different age background on the adoption and implementation of AI-powered virtual reality in enhance business education delivery in tertiary institutions in Bayelsa State.

Hypothesis 3

There is no significant difference in the mean rating of respondents based on their status on the adoption and implementation AI-powered content recommendation engine in enhance business education delivery in tertiary institutions in Bayelsa State.

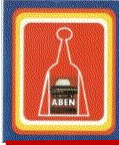


Table 8: Computation of no significant difference on the mean rating of respondents based on their status on the adoption and implementation AI-powered content recommendation engine in enhance business education delivery in tertiary institutions in Bayelsa State.

Responses **Mean** **SD** **z-cal** **α** **Df** **z-crit** **Dec.**

Status **x** (0.05)

Single 1143.630.67 **Accept**

Married 533.440.581.900.051651.96 **H₀₃**

Source: Field survey, 2024

As shown in Table 4.8, the z-calculated value of 1.90 is less than the z-critical value of 1.96 at 165 degree of freedom and 0.05 level of significance. The researcher accept the null hypothesis. Based on the hypothesis testing, the researcher concludes that there is no significant difference in the mean rating of respondents based on their status on the adoption and implementation AI-powered content recommendation engine in enhance business education delivery in tertiary institutions in Bayelsa State

Summary of Result Findings

Table 4. 19 Result Summary of Hypotheses Analysis

Hypotheses	Statistical Tool	z_{crit}	z_{cal}	α	Statistical Decision	Remarks
Ho ₁	z-test	1.96	1.27	0.05	Significant	Accept
Ho ₂	z-test	1.96	0.83	0.05	Significant	Accept
Ho ₃	z-test	1.96	0.90	0.05	Significant	Accept

Source: Researcher's Computation, 2024

From the summary of hypotheses table above the result of the hypotheses of the study were presented in line with the statistical decision rule: 'For the hypothesis testing, the null hypothesis of no significant difference will be accepted when the z-calculated (z-cal) value will be less than z-table (z-tab) of 1.96 at 0.05 level of significance. On the other hand, the hypothesis of no significance will be rejected when the z-calculated (z-cal) value greater than the z-table (z-tab) value of 1.96 at 0.05 level of significance'. Hence:

- There is no significant difference in the mean rating of male and female students on the adoption and implementation AI-powered chatbots in enhancing business education delivery in tertiary institutions in Bayelsa State.
- There is no significant difference in the mean rating of students based on different age background on the adoption and implementation of AI-powered virtual reality in enhance business education delivery in tertiary institutions in Bayelsa State.
- There is no significant difference in the mean rating of students based on their status on the adoption and implementation AI-powered content recommendation engine in enhancing business education delivery in tertiary institutions in Bayelsa State.



Discussion of Findings

The central aim of this research was to examine how the adoption and application of Artificial Intelligence (AI) technologies can improve the delivery of business education in tertiary institutions within Bayelsa State. Specifically, the study focused on determining the potential of AI-driven tools—such as chatbots, virtual reality (VR), and content recommendation engines—in enhancing teaching and learning in this context.

Data collected from a sample of 167 business education students across the three tertiary institutions in Bayelsa State revealed that there was no statistically significant difference in respondents' ratings regarding the role of these AI tools in enhancing business education delivery. This implies a broad consensus among students about the positive impact of such technologies.

These findings align with the conclusions of Fernández, Fernández, and Aburto (2019), who emphasized that AI and modern digital tools enrich both teaching and learning experiences by offering valuable insights to educators and administrators. They further noted that AI fosters collaborative learning and improves learning environments. Similarly, Sharma (2023) highlighted that AI tools—like chatbots and VR—can simulate real-world business situations, personalize learning, and support assignment completion, all of which enhance student engagement.

Research by Son, Kim, and Kim (2019) supports these results by showing that AI-powered chatbots can provide a more personalized and interactive learning process, particularly benefiting students who may struggle with conventional instructional methods. Zhang and Chan (2021) also emphasized the usefulness of VR in creating immersive, practice-oriented learning environments for marketing and other business-related applications.

Furthermore, Tang, Dewan, and Kumar (2019) indicated that content recommendation engines can guide students toward relevant learning materials, expanding their understanding—especially in self-paced or online learning contexts. Additionally, Kumar, Sharma, and Sharma (2020) explained that AI not only streamlines the integration of communication technologies and human interactions but also improves educational quality by offering individualized feedback and enhancing teaching effectiveness.

Conclusion

The overall mean responses of participants suggest that the use of AI technologies holds significant promise for improving business education delivery in Bayelsa State's tertiary institutions. Moreover, the results of the z-test showed no significant differences in students' perceptions, indicating widespread agreement on the value of these tools. Thus, the findings affirm that AI-powered educational technologies—such as chatbots, virtual reality, and content recommendation engines—can greatly support and enhance the learning experience within the business education field.

Recommendations

In light of these findings, the following recommendations are proposed:

Integration of AI Technologies: Tertiary institutions should incorporate AI tools like chatbots, virtual reality, and content recommendation systems into their business education programs to promote engaging, customized, and effective learning.

Capacity Building for Staff: Academic institutions should organize comprehensive training programs for faculty and administrative staff on the effective deployment of AI tools in instructional settings.

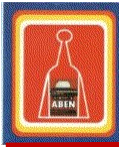


Collaboration with Industry Stakeholders: Institutions should partner with industry professionals and organizations to ensure their curricula reflect current technological advancements and business practices.

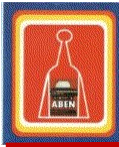
Support for Innovation and Research: Universities should foster research into the application of AI in education by encouraging faculty and students to experiment with and innovate new ways of leveraging these technologies to improve teaching and learning outcomes.

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