ARTIFICIAL INTELLIGENCE-DRIVEN TECHNOLOGY AND ENTREPRENEURIAL SKILLS DEVELOPMENT AMONG BUSINESS EDUCATION GRADUATES FROM PUBLIC UNIVERSITIES

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To cite this article (APA): Agbonaye, A. A., & Muhammed, T. M. (2025). Artificial intelligence-driven technology and entrepreneurial skills development among business education graduates from Public Universities. *AAU Journal of Business Educators, 5* (1), 278-286.

Abstract

This study examined the current state of artificial intelligence (AI) and entrepreneurial skills development among Business Education graduates in Public Universities in Edo State, Nigeria. A descriptive survey research design was adopted to achieve the central aim of the study. The population comprised 84 graduating students of business education in the 2023/2024 academic session from two Public Universities, namely: University of Benin and Ambrose Alli University. The total population or census sampling was employed to select the entire population for this study. The instrument used for data collection was a structured questionnaire, titled: AI and Entrepreneurial Skills Development among Business Education Graduates from Public Universities. The instrument was subjected to face and content validation to determine its adequacy and appropriateness for its proper wording. To establish the reliability, 20 copies of the instrument were administered on the graduating students of business education who were not part of the study. The data obtained was subjected to a test of internal consistencies of the items in the instrument, using Cronbach's alpha method, which yielded a coefficient value of 0.81. The research questions were answered using Mean and Standard Deviation. The results showed that that the current state of AI-driven technologies foster the identification of entrepreneurial opportunities, critical thinking and innovation skills development, and digital scalability and growth skills development among Business education graduates from Public Universities in Edo State, Nigeria. The authors of the present study recommended, among others, that management should endevour to establish AI Startup Lab as part of the graduate program were students can prototype and validate by using AI-driven technologies to scale and automate business processes.

Keywords: Artificial Intelligence, AI-Driven Technologies, Business Education Graduates, Entrepreneurial Skills Development, Public Universities.

Introduction

Entrepreneurship is the process of identifying, developing, and bringing a new business idea to life. It involves taking risks to create and manage a business venture with the aim of making a profit, solving problems, or delivering value to society. Entrepreneurship plays a crucial role in economic development of any nation by fostering innovation, increasing competition, and driving job creation for economic growth. In essence, entrepreneurship is not just about starting a business it's about creating solutions, adding value, and making a positive impact on the economy and society. With the rise of artificial intelligence (AI), the landscape of entrepreneurship education and skills development is undergoing rapid transformation. AI is a branch of computer science that focuses on creating systems capable of performing

tasks that typically require human intelligence. Ertel (2024) opined that AI works by using algorithms and models to process vast amounts of data, identify trends, and make predictions or automate actions. The potential benefits of AI are vast, spanning across various industries, including healthcare, finance, education, and business (Ertel, 2024). In education, AI can be used to personalize learning experiences, enhance decision-making, and improve efficiency in managing educational processes.

In recent years, AI has emerged as a transformative force across multiple industries, reshaping how businesses operate, how teaching and learning in education is delivered, including how individuals interact with technology. Aldosari (2020) emphasized that AI encompasses various technologies such as machine learning, natural language processing, robotics, and automation, which enable machines to simulate human intelligence and perform complex tasks. These innovations are influencing economies worldwide, particularly in the areas of job creation, business development, and skill acquisition (Bialkova, 2024). In Nigerian Universities, business education is a vital academic field of study designed to equip students with the knowledge and skills necessary to thrive in the business world. The curriculum of business education often includes subjects such as general management, office information, office technology, office management, accounting, marketing, and entrepreneurship. Graduates of business education are expected to possess a wide-range of skills, including critical thinking skills, communication skills, financial literacy skills, AI-driven automation and efficiency skills, critical thinking and innovative skills, AI-Driven digital scalability and growth, among others. These skills prepare business education graduates for careers in business management, entrepreneurship, and other related fields.

Dabbous and Boustani (2023) stated that graduates of business education programmes are expected to possess not only theoretical knowledge, but also practical entrepreneurial skills, which are essential for navigating the challenges of entrepreneurship and are critical in fostering economic growth and innovation. Some scholars such as Pennetta et al., (2024), Olatunde-Aiyedun (2024) and Godswill and Margaça (2024) further emphasized that entrepreneurial skills are set of competencies, attributes, and abilities that enable individuals to identify opportunities, take calculated risks, manage resources, and create sustainable businesses. They added that these skills are not only essential for launching and operating entrepreneurial businesses, but also applicable in various professional settings, where creativity, problem-solving, and leadership are paramount. Equipping graduates with entrepreneurial skills, prepares them to be self-reliant and contribute to economic development of the nations. These can be achieved through technological advancements and skills development such as AI-driven automation and efficiency skills, critical thinking and innovative skills, AI-driven digital and growth to enhance productivity and innovation.

AI automation is transforming business education by enhancing operational efficiency and improving the learning experience. This, in turn, influences the entrepreneurial skills development among University Graduates in every aspect of business, from marketing to human resources, requiring future professionals to possess not only theoretical knowledge, but also practical skills. The introduction of AI-driven automation skills into business education curriculum would help to enhance students' readiness for the evolving job market and builds critical thinking skills in data-driven decision-making processes. The integration of AI into business education curriculum is essential for preparing students to lead in a data-driven and technology-centric world and to foster entrepreneurial mindset, and preparing graduates to launch and sustain successful businesses in a competitive economy. AI facilitates personalized learning that enhance entrepreneurial intentions, transforms individual entrepreneurial capabilities, and necessitates curriculum development. AI can empower business education graduates from Public Universities with crucial entrepreneurial skills, including innovation, digital literacy, financial management, and data-driven decision-making. Xie et al. (2022) verifies that students' awareness and application of AI knowledge-based crowdsourcing positively influence their learning and practice in innovation and entrepreneurship.

Ramadani et al. (2022) concluded that AI in Entrepreneurship Education positively promote graduates' intentions to engage in entrepreneurial activities by providing them with relevant skills and

knowledge that will encourage entrepreneurial mindset and problem-solving, teaches graduates to think critically, adapt to technology trends, and develop innovative solutions to foster growth and entrepreneurial mindset, explore emerging business models such as AI-as-a-Service and AI-driven startups for remote collaboration and business management including AI-based project management tools such as (Trello, Asana) posture to remote business models and (drop shipping, freelancing) to promote independent entrepreneurship for sustainability, and trust in their ventures. AI-driven automation and efficiency can be implemented via critical thinking. Critical thinking is the ability to analyze information objectively, evaluate arguments, and identify logical connections. Critical thinking skills are very vital for moving an industrial society to one in which workers make increasing complex decisions at work and must deal with the pace and magnitude of changes in technology. Critical thinking skills are vital for business education graduate seeking to acquire entrepreneurial skills to navigate complex situations or problems, think independently, and make sound judgments in both academic and professional contexts in order to produce and allows graduate to approach challenges in a strategic and analytical manner for successful business ventures. In addition, critical thinking fosters creativity and innovation, entrepreneurs' mindset for imagination to spot market gaps, and develop solutions that better meet the needs of the societies.

Ead et.al. (2022) emphasized that critical thinking is a core academic skill and a necessity of the twenty-first century in particular. Business education students must be trained to deal with the huge amount of information they are receiving in this era, more clearly about what effects the quality of education, economic, life and indicates how they can continually improve. Critical thinking skills are vital for moving from an industrial society to one in which workers make increasingly complex decisions at work and must deal with the pace and magnitude of changes in technology. It has become a skill that entrepreneurs require in businesses to think clearly about their projects, make sound decisions, and convince customers to buy their products, and investors to invest in their work. Critical thinking is important for improving work and solving problems, which means that entrepreneurs can learn to identify the foundation on which a project is built and carefully sort out its success. It will also be able to address some salient questions, such as: Is there a demand for my product or service? How can my project be financed? Where should its workplace be? What are my long-term goals? Should I seek a patent? Who are my competitors? Critical thinking can help answer these questions and make them more accurate and objective. Sometimes, entrepreneurs require investors to participate in their projects, which entail an effort to convince and impress the investor. It is very necessary to prepare convincing and logical answers, developed critical thinking and modeled these guiding questions. Thus, think about what will convince the investor to invest in your organization. Building this argument with the tools entail to persuade others to accept your viewpoint, and the argument can include premises and results.

Juliana et al (2021) opined that innovation is the process of developing new business concepts with the purpose of generating profit, assisting the community and achieving the goals of a business. Ali et al (2024) further emphasized that AI fosters innovation by enabling rapid prototyping, optimizing research and development, and streamlining product testing. AI-driven tools such as generative design software and digital twins allow entrepreneurs to experiment with different product models before market launch. Predictive analytics help businesses identify emerging market trends and align their innovations with customer demands. Pennetta et.al. (2024) emphasized that AI-powered recommended technologies enable personalized service delivery, improve customer satisfaction and drive business growth. Entrepreneurs who integrate AI into their innovation processes may gain a competitive advantage by accelerating product development and reducing costs. AI-powered platforms such as Coursera and Udemy offer business and entrepreneurship courses with real-time feedback. Business education graduates may use AI-driven chatbots and virtual mentors to provide continuous guidance for business idea development that can improve innovation by automating tasks, analyzing data, and identifying patterns, but it lacks human-like judgment, creativity, and critical thinking is essential to bridge this gap, ensuring AI outputs are interpreted, contextualized, and applied effectively. This combination of AI and human judgment

allows for more strategic and ethical decision-making. Scalability skills refer to the abilities and knowledge that help individuals or organizations grow efficiently, handling increased workload demand or complexity without a significant drop in performance or quality. AI-driven scalability significantly impacts the economic, financial market value of traditional firms by automating tasks, improving efficiency and reducing costs. AI skills enable entrepreneurial businesses to expand their customer base, introduce new products or services, and penetrate new markets more effectively. These advancements contribute to increased revenue potential and enhanced enterprise valuation that well significantly transforming business education by enhancing entrepreneurial skills development among graduates from Public Universities to fostering scalability and growth in entrepreneurial businesses.

The advent of AI-driven technologies skills like ChatGPT, is prompting a redefinition of entrepreneurship education. These technologies facilitate various activities, such s idea generation, business model development, business plan writing, and customer interviews by transforming traditional educational methodologies. Awad et al. (2024) examined how AI-driven technologies, such as Chat GPT, are redefining Entrepreneurship Education, suggesting that integrating AI into Entrepreneurship Education can equip students with the tools to enhance their entrepreneurial skills and competencies. Recent empirical studies have provided valuable insights on how AI can enhance entrepreneurial skills among business education graduates, contributing to scalability and growth in the field. For instance, Wang et al. (2024) opined that students perceived value, usefulness, and eases of use of AI positively influenced their intention to utilize AI tools, in turn, significantly impacted their entrepreneurial intentions. The integration of AI into business education curriculum could better prepare students for the evolving demands of entrepreneurial landscape, thereby contributing to scalability and growth in business world.

Statement of the Problem

In recent years, the integration of AI into education sector has reshaped various institutions and industries to revolutionize how businesses operate and influencer the types of skills that are demanded in the workforce of a nation. For business education graduates, the ability to adapt to these technological advancements and apply AI-driven tools is critical for entrepreneurial success in an increasingly competitive and digital marketplace. Entrepreneurial skills are essential for graduates who seek to either launch their own business or excel in organizational roles. However, the extent to which AI-driven influence entrepreneurial skills development among business education graduates in Public Universities has remained largely underexplored. Many graduates from our numerous tertiary institutions in Nigeria appear to lack exposure to AI-driven tools and technologies during their education and training, which raises concerns about their readiness to navigate the modern entrepreneurial landscape and apply it. If business education graduates are not equipped with the knowledge on how to use AI tools, they may struggle to compete in a job market that increasingly values digital proficiency and the ability to leverage AI skills for business innovation. These are some of the worries of the authors, necessitating the need to embark on this study, by investigating the current state of AI and entrepreneurial skills development among business education graduates in Public Universities in Edo State, Nigeria.

Purpose of the Study

The central purpose of this study was to assess the current state of AI and entrepreneurial skills development among business education graduates in Public Universities in Edo State, Nigeria. Specifically, the study sought to determine:

1. the current state of AI-driven technologies in fostering identification of entrepreneurial opportunities among business education graduates from Public Universities.
2. the current state of AI-driven technologies in fostering critical thinking and innovation skills development among Business education graduates from Public Universities.
3. the current state of AI-driven technologies in fostering digital scalability and growth skills development among Business education graduates from Public Universities.

Research Questions

The following research questions guided the study.

Research Question 1: What is the current state of AI-driven technologies in fostering identification of entrepreneurial opportunities among business education graduates from Public Universities?

Research Question 2: What is the current state of AI-driven technologies in fostering critical thinking and innovation skills development among Business education graduates from Public Universities?

Research Question 3: What is the current state of AI-driven technologies in fostering digital scalability and growth skills development among Business education graduates from Public Universities?

Methods

Research Design

A descriptive survey research design was adopted to achieve the central aim of the study. The design was considered appropriate for this study in that it will help to sought the opinions of the respondents.

Population and Sampling Procedure

The population for this study comprised 84 graduating students of business education in 2023/2024 academic session from two Public Universities, namely: University of Benin and Ambrose Alli University. The total population sampling, also known as the census sampling was employed to select the entire population for this study. As a type of purposive sampling method, total population sampling is a non-probability sampling, which involves the study of the entire population instead of by adopting a sample.

Research Instrument

The instrument used for data collection was a structured questionnaire, titled: AI and Entrepreneurial Skills Development among Business Education Graduates from Public Universities. The instrument was designed by the authors of this present study, and was developed from existing literature related to the subject matter. The instrument had 20 items, which was designed to elicit responses from the subjects.

Validation and Reliability of Instrument

The instrument for data collection was subjected to face and content validation to determine its adequacy and appropriateness for its proper wording. This was performed by presenting it to three experts, two in business education and one in measurement and evaluation. To establish the reliability, 20 copies of the instrument were administered on the graduating students of business education who were not part of the study. The data obtained after the trial testing, was subjected to a test of internal consistencies of the items in the instrument, using Cronbach's alpha method, which yielded a coefficient value of 0.81.

Data Collection and Analysis

84 copies of instrument were administered on the respondents and were retrieved on the spot with the help of two research assistants. Using this method, all the copies of the instrument were administered and retrieved immediately. The research questions were answered descriptively using Mean and Standard Deviation, based on a 4-point modified scale, ranging from Very High = 4, High = 3, Low = 2, Very Low = 1. The decision rule was based on any item with a mean score of 2.50 and above is considered as High, while any item with a mean score of below 2.50 is were considered as low.

Results

Research Question 1: What is the current state of AI-driven technologies in fostering identification of

entrepreneurial opportunities among business education graduates from Public Universities?

Table 1: Mean and Standard Deviation on the Current State of AI-Driven Technologies in Fostering Identification of Entrepreneurial Opportunities among Business Education Graduates from Public Universities.

S/N	Item	N	M	SD	Remark
1.	AI tools improve the student's ability to evaluate the strengths and weaknesses of business opportunities	84	3.37	.715	High Extent
2.	AI has improved the student's ability to identify and exploit business opportunities.	84	3.58	.572	High Extent
3.	AI has increased the student's efficiency in managing time and resources in entrepreneurial activities.	84	3.40	.693	High Extent
4.	AI-driven automation is most beneficial for entrepreneurs business planning, risk management, sales and cost reduction	84	3.29	.696	High Extent
5.	AI-driven automation enhances decision-making skills on or makes students overly reliant on AI.	84	3.31	.897	High Extent
6.	Online AI-Powered platforms such as (Course. Udemy) offer business and entrepreneurship courses with real-time feedback.	84	3. 19	715	High Extent
7.	AI-driven chatbots and Virtual Mentors Automated financial modeling tools help students create compelling business plans.	84	3,44	669	High Extent
	Cluster Mean		3.39	0.12	High Extent

Note. N = Total Population, M = Mean, SD = Standard Deviation.

Table 1 showed that the respondents rated item one to five as high with a Mean rating ranging from 3.29 to 3.58, while the Standard Deviation ranges from .572 to .897. The cluster Mean indicates a Mean of 3.39. Based on these results, the above Mean score showed that the current state of AI-driven technologies foster the identification of entrepreneurial opportunities among business education graduates from Public Universities.

Research Question 2: What is the current state of AI-driven technologies in fostering critical thinking and innovation skills development among Business education graduates from Public Universities?

Table 2: Mean and Standard Deviation on the Current State of AI-Driven Technologies in Fostering Critical Thinking and Innovation Skills Development among Business Education Graduates from Public Universities.

S/N	Item	N	M	SD	Remark
8.	AI enhances the student's ability to develop and creative solutions to business challenges.	84	3.44	.669	High Extent
9.	AI has ability to adapt to changes in the business environment more effectively	84	3.44	.639	High Extent
10.	AI enhances student's ability to thinking logical respond to unexpected challenges in entrepreneurship.	84	3.31	.701	High Extent
11.	AI has ability for analytical skills include AI-related courses.	84	3.21	.750	High Extent
12.	Organizing and absorbing important information.	84	3.19	.715	High Extent

13.	Visualizing, monitoring and evaluating at a deeper level.	84	3. 37	.793	High Extent
14.	Identifying strengths and weaknesses in any field.	84	3.29	.723	
	Cluster Mean		3.32	0.04	High Extent

Note. N = Total Population, M = Mean, SD = Standard Deviation.

Table 2 showed that the respondents rated item eight to fourteen as high with a mean rating ranging from 3.29 to 3.44, while the Standard Deviation ranges from .639 to .793. The cluster Mean indicates a Mean of 3.32. Based on these results, the above Mean score showed that the current state of AI-driven technologies foster critical thinking and innovation skills development among Business education graduates from Public Universities.

Research Question 3: What is the current state of AI-driven technologies in fostering digital scalability and growth skills development among Business education graduates from Public Universities?

Table 3: Mean and Standard Deviation on the Current State of AI-Driven Technologies in Fostering Digital Scalability and Growth Skills Development among Business Education Graduates from Public Universities.

S/N	Item	N	Mean	SD	Remarks
15	AI-driven tools such as ChatGPT, Google Bard and AI-powered analytics) for business or entrepreneurship.	84	3.46	.727	High Extent
16	AI-driven tools facilitate faster business scalability for startups.	84	3.44	.608	High Extent
17	AI-driven tools can help bridge the innovation gap among business education graduates.	84	3.44	.574	High Extent
18	AI-driven tools contributes most to business scalability in Marketing, Finance, product development and Customer engagement.	84	3.35	.623	High Extent
19	AI-driven tools help the students generate new and creative ideas for entrepreneurial ventures.	84	3.33	.706	High Extent
20	Use AI–powered fraud detection for finance and Banking.	84	3.21	750	High Extent
21	Use AI-powered for predictive maintenance and production.	84	3.44	639	High Extent
	Cluster Mean		3.40	0.07	High Extent

Note. N = Total Population, M = Mean, SD = Standard Deviation.

Table 3 showed that the respondents rated item fifteen to twenty-one as high with a Mean rating ranging from 3.33 to 3.46, while the Standard Deviation ranges from .574 to .727. The cluster Mean indicates a Mean of 3.40. Based on these results, the above Mean score showed that the current state of AI-driven technologies foster critical thinking and innovation skills development among Business education graduates from Public Universities.

Discussions

The study focused on the current state of AI and entrepreneurial skills development among business education graduates in Public Universities in Edo State, Nigeria. Specifically, the study sought to focused on the current state of AI-driven technologies in fostering identification of entrepreneurial opportunities among business education graduates from Public Universities; the current state of AI-driven technologies in fostering critical thinking and innovation skills development among Business education

graduates from Public Universities; and the current state of AI-driven technologies in fostering digital scalability and growth skills development among Business education graduates from Public Universities. From the results of the analysis, the respondent agreed that the current state of AI-driven technologies foster the identification of entrepreneurial opportunities, critical thinking and innovation skills development, and digital scalability and growth skills development among Business education graduates from Public Universities in Edo State, Nigeria. The findings from this present study are in line with the study of Xie et al. (2020) whe verified that students' awareness and application of AI knowledge-based crowdsourcing positively foster their learning and practice in innovation and entrepreneurship. In addition, Obschonka and Audretsch (2021) found that AI-driven technologies foster entrepreneurial activities by automating complex tasks, thereby allowing entrepreneurs to focus on strategic decision-making and innovation. This is because AI-driven automation is transforming business education by enhancing operational efficiency and improving the learning experience. This, in turn, fosters entrepreneurial skills acquisition of University graduates in several ways.

The findings of the present study collaborate the viewpoints of Ertel (2024) who reported that AI-driven technologies foster innovation that enables rapid prototyping, optimizing research and development. The findings also support the findings of Pennetta et.al (2024) who state that AI-powered recommended engines enable personalized service delivery, improve customer satisfaction and drive business growth. Entrepreneurs who integrate AI technologies into their innovation processes gain a competitive advantage by accelerating product development and reducing costs. On this note, the study of Dwivedi, et al (2021) affirmed that creativity and critical thinking skills are fundamental entrepreneurial skills that enable individuals to generate innovative ideas and make informed decisions. Entrepreneurs can leverage these AI tools to refine their ideas, ensuring they align with market demands and organizational goals. The findings from this present study further aligns with the study of Awad et al. (2024) who suggested that integrating AI tools into entrepreneurship education can provide students with practical tools to enhance their entrepreneurial competencies and skills, thus contributing to scalability and growth in the field. On this note, the study of Wang et al. (2024) found that that students perceived value, usefulness, and ease of use of AI positively foster their intention to utilize AI tools and technologies, which in turn significantly impacted their entrepreneurial intentions.

Conclusion

The findings of this study has shown that the set out objectives have been achieved. We conclude that embedding AI-powered skills into the development of entrepreneurial skills and competencies among business education graduates significantly fosters their technical proficiency. This is accomplished by encouraging critical thinking, AI growth besides scalability, AI-driven automation, effective business education graduates, and ethical awareness for entrepreneurial mindsets focused on the future. It suggests that the strategic use of AI in Business Education is essential for developing competent, innovative entrepreneurs capable of thriving in a competitive landscape.

Recommendations

The following recommendations were made:

1. Management should endeavor to establish AI Startup Lab as part of the graduate business programmes, were they can prototype and validate by using AI technologies to scale and automate business processes.
2. AI creativity and critical thinking in business education is vital for cultivating Future-Ready entrepreneurs therefore, curriculum design should embed these elements through project-based learning, and AI literacy, and interdisciplinary approaches.
3. By integrating AI into business education programmes, institutions can better prepare students for the evolving demands of the entrepreneurial landscape, thereby contributing to scalability and growth in business education.

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