IMPACT OF ARTIFICIAL INTELLIGENCE ON ENTREPRENEURSHIP EDUCATION IN UNIVERSITY OF BENIN.

BY

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DEPARTMENT OF ENTREPRENEURSHIP

FACULTY OF MANAGEMENT SCIENCE

UNIVERSITY OF BENIN

BENIN CITY

NOVEMBER, 2025

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ENTREPRENEURSHIP FACULTY OF MANAGEMENT SCIENCES UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.Sc) DEGREE IN ENTREPRENEURSHIP

NOVEMBER, 2025

DECLARATION

I, Erus Oghenewhare Blessing, declare that;

i. This study is based on a study undertaken by me in the Department of Entrepreneurship, Faculty of Management Sciences, University of Benin, Benin City, under the supervision of MRS I. K. AKHATOR of the Department of Entrepreneurship, Faculty of Management Sciences, University of Benin, Benin City, Nigeria.

ii. This work has not been submitted for the award of degree elsewhere.

iii. Ideas and views are product of my personal research and where the view of others has been expressed, they have been duly acknowledged.

iv. Any liability arising from this work is to be wholly borne by me alone

_____ _____

Erus Oghenewhare Blessing **DATE**

CERTIFICATION

We, certify that this research project was carried out by Erus Oghenewhare Blessing in the Department of Entrepreneurship, Faculty of Management Sciences, University of Benin, Benin City, Nigeria. It is adequate in scope and quality in partial fulfilment of the requirements for the award of Bachelor of Science (B.Sc.) degree in Entrepreneurship.

_____ _____

MRS I. K. AKHATOR **Date**

(Project Supervisor)

_____ _____

DR. OSAHON OKUNBO **Date**

(Project Coordinator)

_____ _____

DR. S. O. OBEKI **Date**

(Head of Department)

DEDICATION

I dedicate this project to the Almighty God for His wisdom, grace, and strength during this journey.

ACKNOWLEDGMENTS

First and foremost, I express my deepest gratitude to God Almighty for His grace, guidance, and unending support throughout the course of this project. Truly, none of this would have been possible without Him.

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ABSTRACT

This study investigates the impact of Artificial Intelligence (AI) on entrepreneurship education among students of the University of Benin, Benin City, Nigeria. It focuses on how selected AI tools ChatGPT, Grammarly, Quillbot, and Meta AI affect students' learning experiences, creativity, and innovative capacities within entrepreneurship courses. A cross-sectional survey research design was adopted, and data were collected from one hundred (100) undergraduate students in the Department of Entrepreneurship through a structured questionnaire. Descriptive and inferential statistical techniques, including correlation and regression analyses, were employed to test the study's hypotheses at a 5% level of significance.

Findings revealed that AI tools significantly enhance entrepreneurship education by improving students' understanding of business concepts, fostering innovative thinking, and strengthening communication and writing skills. However, challenges such as poor digital infrastructure, high data costs, limited awareness, and inadequate institutional support were identified as major barriers to effective AI integration. The study concludes that while AI technologies hold transformative potential for entrepreneurship education, their effective utilization requires strategic curriculum integration, digital capacity building, and infrastructural investment. It recommends that universities incorporate AI literacy into entrepreneurship programs, provide training for educators, and create enabling environments for students to explore AI tools responsibly and productively.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

In the 21st century, the integration of artificial intelligence (AI) into educational systems has become increasingly central to the transformation of teaching and learning across the globe (Pedro et al., 2019). As the global economy becomes more dependent on digital innovation and automation, AI has emerged as a revolutionary force in shaping both the structure and delivery of education. According to Copeland (2024), artificial intelligence is the capability of digital systems to perform tasks such as reasoning, learning, and problem-solving—activities that typically require human intelligence. This capability has brought immense possibilities into various fields, including business, healthcare, manufacturing, tax administration and more recently, education.

The Nigerian educational landscape, particularly in the area of business and entrepreneurship education, is undergoing a gradual but critical shift. As entrepreneurship continues to gain prominence as a key driver of economic development and employment, especially among youths and graduates, the need to equip students with entrepreneurial mindsets and practical skills becomes even more pressing. Yet, traditional methods of teaching entrepreneurship often fall short in providing the hands-on, adaptive, and innovative training required in today's highly volatile and competitive business environment (LeewayHertz, 2023; Komodromos, 2025; Faustino-Pulliam, 2025).

artificial intelligence holds the potential to close this pedagogical gap. From AI-driven business simulations and personalized learning environments to chatbots and virtual tutors, technology is now being used to enhance entrepreneurial learning by providing students with tools for experimentation, creativity, and data-informed decision-making (Al-Fattal, 2025; Cantú-Ortiz et al., 2020). These tools do not just transmit knowledge—they also shape students' ability to recognize opportunities, manage risks, solve real-world problems, and innovate under dynamic conditions traits associated with an entrepreneurial mindset (Igwe, 2021).

Entrepreneurship education is expected to train individuals not just in the mechanics of starting a business, but in cultivating entrepreneurial traits such as critical thinking, adaptability, innovation, and leadership (Badawi et al., 2024). AI technologies such as tools used that can be used for education purpose such as machine learning, predictive analytics, and natural language processing can facilitate this by offering data insights, interactive problem-solving simulations, and immediate feedback mechanisms. As noted by Goyal et al., (2024), tools like virtual assistants, AI-powered analytics platforms, and business modeling software enhance personalized learning while also improving students' creative and cognitive abilities.

In Nigeria, entrepreneurship is seen as a strategic solution to the persistent challenges of youth unemployment, underemployment, and poverty. Yet, the effectiveness of entrepreneurship education in Nigerian universities remains limited by infrastructural deficits,

lack of funding, obsolete curricula, and limited access to digital tools. While students may have theoretical knowledge, their exposure to practical entrepreneurial tools especially AI-enabled ones remains insufficient. Despite an increase in awareness and usage of basic AI tools like grammarly and chatGPT, there is still a significant gap in how these tools are harnessed to develop deeper entrepreneurial competencies (Iwerima et al., 2024).

Entrepreneurship education students in Nigerian universities are expected to possess a wide array of skills including digital literacy, problem-solving, innovation, and business acumen (Miço & Cungu, 2023). However, the traditional lecture-based approach does little to foster these qualities. AI technologies, when strategically integrated, can enhance curriculum delivery and provide real-time, practical engagement through simulations, virtual business labs, and adaptive learning platforms (Bauman & Lucy, 2021). These not only make learning more interactive but also encourage independent learning and creativity, which are essential to entrepreneurship (Debarliev et al., 2022).

AI-driven educational platforms such as Coursera, Edmodo, and Khan Academy offer learners the flexibility to tailor their learning paths, especially in entrepreneurship modules. In these platforms above, students receive personalized learning recommendations, engage in business decision-making games, and interact with chatbots and trainers, all of which help in solidifying both theoretical and practical business knowledge (Awad et al., 2024).

Moreover, the entrepreneurial mindset is not limited to individuals seeking to start businesses. It is a valuable skill set for anyone aiming to make a difference in organizations, communities,

and public service (Ratten & Usmanij, 2021). AI can help students enhance traits like resilience, initiative-taking, and calculated risk-taking. As Bialkova (2024) notes, AI fosters entrepreneurial competencies by exposing students to uncertain, data-intensive environments that simulate real-world business operations.

However, the effective deployment of AI in entrepreneurship education in Nigeria faces a myriad of challenges. These include unreliable power supply, limited access to digital infrastructure, cost barriers, and the lack of AI training for educators (Ratten & Jones, 2021). In many Nigerian universities, the adoption of AI into curricula is still at the experimental stage, and most educators lack the technical know-how to implement these tools effectively. According to Adesulu (2018), the disparity between rising demand for modern education and limited institutional capacity results in many qualified students being denied access to the tools and platforms needed to compete in today's global economy.

Despite these challenges, empirical studies show promising developments. For instance, Wang et al. (2024) found that students perceived usefulness and ease of use of AI technologies significantly influenced their intention to apply AI in entrepreneurial contexts. This suggests a readiness to embrace AI tools, provided there is adequate institutional support and curriculum integration. Moreover, Juliana et al. (2021) emphasized the role of AI in innovation, asserting that technologies like generative design software and digital twins accelerate product development and improve customer satisfaction.

AI integration also affects how entrepreneurship education is scaled. Technologies such as AI-based project management tools (e.g., Trello, Asana) allow students to practice team collaboration, task allocation, and remote work—skills that are vital in today's startup ecosystems. AI further enhances creativity through platforms that support idea generation, prototyping, and simulation of entrepreneurial ventures. According to Xie et al. (2022), AI knowledge crowdsourcing improves students' engagement and performance in innovation-focused education.

Another critical dimension is the role of critical thinking. Entrepreneurs need to make informed decisions, evaluate multiple options, and construct convincing arguments to attract investors or partners. AI can assist in modeling these decisions, but it cannot replace human judgment. Therefore, education systems must simultaneously develop both AI literacy and human-centered problem-solving skills (Ead et al., 2022).

1.2 STATEMENT OF THE PROBLEM

In recent years, the integration of artificial intelligence (AI) into the education sector has transformed how learning is delivered and how professional competencies are developed. AI has reshaped not only academic institutions but also the business landscape by redefining operations, decision-making, and innovation processes. For entrepreneurship graduates, particularly in an era of digital globalization, the ability to harness AI-driven tools is no longer optional but essential. These tools are influencing the kinds of skills required in the modern workforce, with entrepreneurial competencies such as opportunity recognition,

problem-solving, adaptability, and data-driven decision-making becoming increasingly AI-dependent (Bialkova, 2024; Awad et al., 2024).

Despite this global shift, the integration of AI into entrepreneurship education in Nigeria—especially within public universities—remains limited. Many graduates of business education programs lack hands-on experience with AI-powered applications such as business simulation software, predictive analytics, and virtual learning assistants. This deficiency leaves them ill-prepared to compete in technologically driven entrepreneurial ecosystems, both in startups and corporate environments, where practical digital proficiency is as critical as theoretical knowledge (Iwerima et al., 2024; Iyoha et al., 2025).

Although awareness of widely accessible AI tools like chatgpt, meta AI and grammarly is gradually increasing among students, there remains a considerable disconnect between awareness and their strategic application for entrepreneurial outcomes (Wang et al., 2024). The prevailing state of education in Nigeria often neglects AI as a core instructional and skill-building component. As a result, graduates may leave universities with little or no exposure to AI-driven simulations of real-world business scenarios, thereby weakening their entrepreneurial confidence, innovation capacity, and ability to scale ventures (Xie et al., 2022).

Furthermore, while global literature highlights the transformative potential of AI in improving entrepreneurship education, empirical evidence within the Nigerian context remains scarce. Most existing studies focus on broader ICT adoption, paying insufficient

attention to AI-specific tools and their pedagogical application in entrepreneurship curricula (Kolade et al., 2021; Oyinlola et al., 2024). Few have examined, in measurable terms, the degree of AI integration into entrepreneurship courses in public universities, the influence of AI adoption on entrepreneurial performance indicators such as innovation and opportunity recognition, or the readiness of instructors and institutions to embrace these technologies.

This gap underscores the urgent need for empirical research that explores not just the extent of AI integration but also its impact on entrepreneurial skill acquisition, innovation, and business scalability. Accordingly, this study focuses on bridging this gap by investigating the level of AI adoption in entrepreneurship education, the challenges limiting its integration, and its effectiveness in preparing students for entrepreneurial ventures in public universities in Edo State, with specific attention to students from University of Benin, Benin City.

1.3 RESEARCH QUESTIONS

i. What is the relationship between chatGPT and entrepreneurship education in University of Benin?

ii. To what extent does grammarly impacts Entrepreneurship education in University of Benin?

iii. How does Quillbot influence entrepreneurship education in University of Benin?

iv. What is the relationship between Meta Ai and entrepreneurship education in University of Benin?

v. How do AI-driven tools enhance University of Benin students' ability to learn and innovate?

vi. What are the key challenges facing the adoption and implementation of AI technologies in entrepreneurship education in University of Benin?

1.4 OBJECTIVES OF THE STUDY

The major objective of this study is to investigate the impact of artificial intelligence on entrepreneurship education in University of Benin. The following specific objectives are to:

1. examine the relationship between chatGPT and entrepreneurship education in University of Benin.
2. investigate the relationship between grammarly and entrepreneurship education in University of Benin.
3. assess the relationship between Quillbot and entrepreneurship education in University of Benin.
4. determine the relationship between Meta AI and entrepreneurship education in University of Benin.
5. evaluate how AI-driven tools enhance University of Benin students' ability to learn and innovate.
6. identify the key challenges facing the adoption and implementation of AI technologies in entrepreneurship education in University of Benin.

1.5 HYPOTHESES OF THE STUDY

H_{01}: There is no significant relationship between chatGPT and entrepreneurship education in the University of Benin.

H_{02}: There is no significant relationship between grammarly and entrepreneurship education in the University of Benin.

H_{03}: There is no significant relationship between Quillbot and entrepreneurship education in the University of Benin.

H_{04}: There is no significant relationship between Meta AI and entrepreneurship education in the University of Benin.

H_{05}: AI-driven tools do not significantly enhance students' ability to learn and innovate in entrepreneurship education.

H_{06}: There are no significant challenges hindering the adoption and implementation of AI technologies in entrepreneurship education in University of Benin.

1.6 SCOPE OF THE STUDY

This research examines the impact of artificial intelligence on entrepreneurship education among students in University of Benin, Nigeria. The study focuses on how AI tools are being

utilized within academic programs to enhance the acquisition of entrepreneurial skills such as creativity, innovation, decision-making, and opportunity recognition.

The study will make use of students in the university of Benin as the targeted area to carry out the research. The study also targets key participants including Staffs, students, entrepreneurship educators, and ICT personnel involved in academic technology support.

The investigation is limited to educational applications of AI such as intelligent tutoring systems, chatbots, predictive analytics tools, business simulations, and virtual learning platforms. Technical design or engineering aspects of AI technologies fall outside the scope of this study. Furthermore, while AI's broader impact on the Nigerian economy is acknowledged, this research is centered strictly on its educational influence within the university of Benin system.

1.7 SIGNIFICANCE OF THE STUDY

This study is particularly timely and relevant in an era where technological competence is rapidly reshaping the nature of work and education. Its implications cut across students, educators, university administrators, policy-makers, and academic researchers. Students stand to benefit from the insights, as the study highlights the kinds of AI tools that can enhance entrepreneurial capacity, foster digital thinking, and improve their preparedness for real-world business challenges. By engaging with these tools, they are better positioned to bridge the gap between theoretical knowledge and practical application. Educators, on the other hand, can draw from the findings to adopt more engaging and innovative teaching strategies

while also adapting instructional content to align with technology-driven entrepreneurship. This will make learning experiences more interactive, relevant, and responsive to the demands of today's economy. University administrators equally gain valuable guidance on academic innovation and strategic decision-making, as the study underscores the importance of investing in digital infrastructure and integrating AI-based teaching resources to ensure institutions remain competitive and aligned with global educational standards. Similarly, policy-makers in the education and technology sectors may find the study useful in shaping frameworks that promote AI-driven skill development in higher institutions, creating enabling environments where digital learning and entrepreneurship can thrive. Finally, academic researchers will also find the study significant, as it contributes to an underexplored area within Nigeria's educational context by providing empirical grounding that enriches the discourse on AI adoption and opens new avenues for further investigation into the relationship between digital learning, artificial intelligence, and entrepreneurial development.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section focuses on the literature review on the impact of artificial intelligence on Entrepreneurship education in University of Benin students. The purpose of this chapter is to examine the relevant theoretical and empirical works in the field. This is to give credit to the work of researchers in the field of study and to identify informational gaps that may be filled in the future

2.2 Conceptual Framework

2.2.1 Entrepreneurship Education

Artificial intelligence (AI) technologies are increasingly transforming the landscape of entrepreneurship education. This evolution enhances key learning outcomes such as opportunity recognition, problem-solving, creative ideation, business planning, and innovation capacity (Fayolle & Gailly, 2015). Evidence from recent meta-analyses—combining results from multiple independent studies to yield more robust and generalizable conclusions—demonstrates that AI-driven learning platforms significantly enhance learning performance, producing stronger effects than traditional e-learning approaches (Zhang et al., 2025). Consequently, these technological advancements foster higher levels of entrepreneurial competence, particularly in strategic thinking and timely decision-making.

Generative AI technologies have been shown to improve the creativity and amount of idea generation in entrepreneurship training courses, which enable students to come up with more innovative business ideas within shorter timeframes than conventional brainstorming sessions (Dwivedi et al., 2024). Moreover, learning platforms based on AI allow for adaptive feedback and personalized learning streams, which have been connected to higher self-efficacy and entrepreneurial intention among university students (Marques et al., 2023).

Beyond the classroom, AI application is making entrepreneurship accessible to many people by lessening technical barriers to entrepreneurship. Studies have shown that with minimal technical knowledge, individuals are currently employing AI to conduct market research, product development, and customer engagement, encouraging more participation in entrepreneurial networks (Nambisan et al., 2019). This occurs particularly in settings where resource limitations traditionally limit entrepreneurial entry, such as in emerging economies (Dana et al., 2021). Compared, recent workforce surveys indicate a steady increase in AI use for expert work, such as extensive use in communication, creativity, and analytics, skills that map closely onto entrepreneurial expertise (Raimo et al., 2023). Cumulatively, these trends affirm that incorporating AI into entrepreneurship education is greater than an additional asset tool but a revolutionary driver of entrepreneurial skill building, innovative capacity, and start-up preparedness (Chen et al., 2021).

2.2.2 Curriculum Integration Level

The degree of integration of AI tools into entrepreneurship education varies significantly from one institution to another, ranging from complementary support that is optional to core integrated aspects of teaching delivery. International surveys conducted more recently indicate that while the majority of universities started with offering AI as optional enrichment tools—e.g., chatbots to answer student queries or AI-supported grammar checkers—there has been a definite move toward mainstream curriculum integration of AI (Chen et al., 2024). In 2019, only 18% of the colleges and universities indicated AI as being part of their mandatory entrepreneurship courses, but by 2023, this had increased to 46%, a 155% increase (Thottoli et al., 2025).

Institutes with higher engagement of AI integrate AI into assessment design, market research assignments, and business plan simulations so that students gain practical skills in AI application (Chen et al., 2024). For example, South Korean and Singaporean universities currently require the use of AI-based market analytics platforms, such as Crunchbase AI and SimilarWeb Insights, in final-year entrepreneurship projects, which has resulted in project completion times that are up to 32% faster and 27% more accurate in terms of markets compared to traditional research methods (Lee & Tan, 2023). Conversely, universities where AI is still an optional add-on have been reporting slower rates of adoption and less student exposure to AI-supported entrepreneurial decision-making (OECD, 2024).

Spatial disparities are also evident. North America and some Asian economies are leading in the integration of AI in mainstream entrepreneurship education, with more than 60% adoption rates, while in the majority of African and Latin American universities, AI is still ancillary supports due to infrastructure and capacity limitations (World Bank, 2024). Comparative studies show that alumni of programs where AI is embedded as a core pedagogical component are 1.8 times more likely to apply AI in real entrepreneurial activities in their first year after graduation than alumni of programs where AI is optional (PwC, 2023).

In Nigeria, the integration of artificial intelligence (AI) into entrepreneurship education remains at an early but developing stage. While most universities are still exploring AI primarily as a supplementary learning tool rather than a core component of the curriculum, there is growing evidence of structured adoption efforts. For instance, a study by Agboma and Ighoroje (2023) on Artificial Intelligence-Driven Technology and Entrepreneurial Skills Development among Graduates from Public Universities examined graduates from the University of Benin and revealed that AI-driven technologies significantly enhance entrepreneurial opportunity identification, critical thinking, innovation, and digital scalability skills. Similarly, Osagie and Omoruyi (2024) reported that Nigerian universities—particularly the University of Benin—have begun integrating AI applications into business analytics and entrepreneurship training programs. However, adoption remains uneven due to infrastructural limitations and policy-related challenges. Although the University of Benin has not yet achieved the same level of systematic AI integration seen in leading global

institutions, ongoing initiatives suggest meaningful progress. With sustained investment in digital infrastructure, faculty training, and formal inclusion of AI in entrepreneurship curricula, the University of Benin is well positioned to become a national leader in AI-driven entrepreneurship education.

2.2.3 Artificial Intelligence

artificial intelligence (AI) refers to the development of computer systems and digital technologies that are capable of performing tasks which typically require human intelligence, such as reasoning, learning, decision-making, and adaptation to new information (Alkatheiri, 2022). Unlike traditional computing systems that rely on explicit programming, AI systems are designed to improve their performance over time through data-driven processes (Chatterjee, 2020). Its core domains include machine learning, natural language processing, computer vision, robotics, and generative models, all of which are increasingly being applied across sectors such as education, business, healthcare, and entrepreneurship (Okonkwo & Ade-Ibijola, 2021; Eze, 2022). In the Nigerian higher education system, AI adoption is gradually expanding, with tools like grammarly, quillbot, chatgpt, and matlab being utilized by students and lecturers for academic writing, data analysis, and business simulations (Ihedioha & Ezeani, 2024; Olayemi & Ogundele, 2023).

Recent studies note that AI-driven tools can enhance entrepreneurship education by improving business planning, ideation, market forecasting, and communication—skills essential for student entrepreneurs (Okonkwo & Uzoka, 2023; Adegboye & Ojo, 2024). For

instance, chatGPT and quillbot support academic and business writing, helping students draft coherent business proposals and feasibility studies, while matlab supports financial and market simulations (Winkler et al., 2023). Generative AI platforms such as chatGPT are increasingly deployed in Nigerian universities to support personalized learning, ideation, and entrepreneurial decision-making (Olayemi & Ogundele, 2023).

However, Nigerian scholars also highlight challenges in AI adoption. These include infrastructural limitations such as unstable power supply, poor internet connectivity, and the high cost of technology deployment (Eze, 2022; Ihedioha & Ezeani, 2024). Furthermore, ethical issues such as plagiarism, over-dependence on AI writing tools, and questions about originality have raised concerns among educators (Okonkwo & Ade-Ibijola, 2021). To mitigate these challenges, UNESCO (2023) and Nigerian policymakers emphasize the importance of AI literacy training, policy frameworks, and investments in digital infrastructure to ensure responsible and equitable use in entrepreneurship education.

Overall, AI in Nigerian universities is increasingly being framed not as a replacement for human creativity but as a complementary tool that enhances teaching, learning, and entrepreneurial innovation. This aligns with the global call for human-centered AI adoption while reflecting Nigeria's unique infrastructural and socio-cultural context (Adegboye & Ojo, 2024; UNESCO, 2023).

2.2.4 AI Tools

artificial intelligence (AI) has become an increasingly important resource for enhancing the quality of entrepreneurship education globally and in Nigeria. By integrating AI-driven tools, universities can provide personalized learning experiences, improve business communication, and expose students to simulations that mirror real entrepreneurial challenges. The following subsections discuss major AI tools and their role in entrepreneurship education with emphasis on Nigerian contexts.

Quillbot

Quillbot is an AI-driven paraphrasing and text enhancement tool increasingly utilized in academic writing and business communication. In Nigerian universities, students employ Quillbot to refine business plans, feasibility studies, proposals, and incubation center reports. By improving sentence structure and clarity, the tool enhances creativity in entrepreneurial documentation and minimizes redundancy in business communication (Odeh & Musa, 2023).

Case studies conducted at Delta State University, Abraka, revealed that students enrolled in entrepreneurship courses frequently rely on AI-powered paraphrasing tools like Quillbot when developing feasibility reports. However, educators expressed concerns that excessive dependence on such tools diminishes originality, weakens critical thinking, and limits the development of independent writing skills (Onifade & Aluko, 2024). Furthermore, ethical

concerns have emerged regarding plagiarism and academic dishonesty, as some students use Quillbot to disguise copied content without proper citation (Eze & Igwe, 2023).

To address these challenges, universities should implement AI literacy programs that teach students responsible and ethical use of paraphrasing tools. Integrating plagiarism detection software, conducting workshops on academic integrity, and designing assignments that require critical reflection and originality can help mitigate misuse. Additionally, embedding AI ethics and digital writing skills into entrepreneurship curricula will ensure that tools like Quillbot are used to enhance, rather than replace, students' creative and analytical capacities.

Grammarly

grammarly is one of the most widely adopted AI tools used in Nigerian higher institutions, particularly in entrepreneurship and business communication courses. It provides real-time correction of grammar, punctuation, and stylistic errors. In entrepreneurship education, grammarly enhances the quality of grant applications, funding proposals, marketing pitches, and project reports (Bello & Eze, 2022). Clear and professional writing is essential for entrepreneurs when presenting ideas to investors or incubators, making grammarly highly relevant in this context (Zhu et al., 2022).

In Kwara State universities, lecturers reported that students who regularly used grammarly produced more polished and professional assignments in business communication courses compared to those who did not (Okoro & Adebayo, 2023). However, reliance on grammarly can conceal underlying weaknesses in writing, as students may fail to develop their own

editing and proofreading skills (Afolabi & Adeoye, 2023). In a similar manner, my observation at the University of Benin shows that while grammarly has helped students produce cleaner and more professional business communication assignments, many still struggle with developing originality and critical thinking in their work. This reflects a broader trend in Nigerian universities, where grammarly is effective at improving the surface structure of writing but does little to enhance deeper cognitive and analytical skills. This observation aligns with findings from Osagie and Omoruyi (2024), who reported that students in Rivers State universities widely rely on grammarly and similar AI tools for learning, yet such use does not automatically translate into stronger academic creativity or independent reasoning.

ChatGPT and Other Generative AI Tools

chatGPT and other large language models (LLMs) such as Claude and Google Bard have introduced new possibilities in Nigerian higher education. chatGPT supports students in entrepreneurship education by facilitating business idea generation, conducting feasibility assessments, providing market research insights, assisting with financial planning, and guiding customer profiling (Aluko, 2023). For example, students in Edo State universities reportedly use chatGPT to generate market entry strategies, SWOT analyses, and pitch deck content for entrepreneurial projects (Agboola & Salami, 2024).

Educators also benefit from chatGPT by generating teaching materials, case studies, and discussion prompts for entrepreneurship courses (Ogunleye & Ajayi, 2022). Despite its

usefulness, challenges include misinformation, plagiarism, overdependence, and ethical issues (Rosemary & Ekankumo 2025). Some Nigerian lecturers have expressed concern that chatGPT encourages surface-level learning, where students copy AI outputs without critically engaging with the material (Eze & Igwe, 2023). At the University of Benin, my observation shows a similar trend: many students rely on chatGPT to complete assignments and project work in entrepreneurship courses. While this reliance has improved the speed, structure, and presentation quality of their submissions, it has also led to overdependence, with some students submitting AI-generated content with little modification. This underscores the importance of embedding AI literacy and critical engagement strategies into the curriculum, ensuring that chatGPT serves as a supportive tool rather than a substitute for originality and deep learning.

MATLAB

Matrix Laboratory (MATLAB) is a high-level computational tool developed in the late 1970s by Cleve Moler, a professor of computer science and mathematics at the University of New Mexico (Moler, 2020). It is widely applied in engineering, science, and financial modeling. In entrepreneurship education, it enables data-driven decision-making, risk analysis, product simulations, and predictive modeling. Nigerian engineering and business students have applied matlab in analyzing production efficiency, financial risks, and consumer demand models (Ogunleye & Ajayi, 2022). For instance, a case study in Lagos revealed that students

in technology entrepreneurship programs used MATLAB to simulate energy solutions before pitching them to investors (Okafor & Adeola, 2024).

However, the adoption of matlab in Nigerian universities remains low due to licensing costs, infrastructural limitations, and a skills gap among instructors (Bali et al., 2024). Only a few elite universities, such as the University of Lagos and Covenant University, have well-established computational labs that support the integration of matlab into entrepreneurship curriculum.

Virtual Assistants and Intelligent Tutoring Systems

Virtual assistants like IBM Watson Assistant, microsoft copilot, and google assistant provide personalized guidance to students through real-time interaction. They assist in organizing learning schedules, generating business resources, and providing step-by-step guidance in project development (Yusuf & Adedeji, 2022).

AI offers unprecedented opportunities to enhance academic performance and reshape educational expectations. AI encompasses a wide range of technologies, including machine learning, natural language processing, and data analytics, which can be utilized to create adaptive learning environments, provide personalized learning experiences, and improve administrative efficiency. These advancements have the potential to transform traditional educational paradigms, making learning more engaging and effective for students (Luckin, Holmes, Griffiths, & Forcier, 2016). AI-driven educational tools can significantly

improve academic performance by offering personalized learning experiences tailored to individual student needs.

Intelligent tutoring systems (ITS) and adaptive learning platforms utilize AI algorithms to analyze students' strengths and weaknesses, providing customized content and feedback that align with their learning pace and style. Research indicates that personalized learning can lead to improved student outcomes by addressing diverse learning needs more effectively (Pane et. al, 2017). AI can play a crucial role in bridging educational gaps and fostering a deeper understanding of technical subjects. Educators can employ AI-based tools to identify areas where students struggle and provide targeted interventions, thereby enhancing overall academic performance. Siemens (2013) corroborated that AI-powered learning analytics can help track student progress in real time, enabling timely support and adjustments to instructional strategies.

In entrepreneurship education, virtual assistants have been used to support students in developing pitch decks, identifying market opportunities, and accessing government-sponsored SME funding schemes. Overall, AI tools such as quillbot, grammarly, chatgpt, matlab, business simulation platforms, and virtual assistants are significantly transforming entrepreneurship education in Nigeria (Ebuka et al., 2023). They promote creativity, innovation, analytical thinking, and communication skills, which are vital for entrepreneurial success. However, infrastructural deficits, ethical challenges, licensing costs, and limited

awareness continue to restrict widespread adoption. There is a need for policy frameworks, lecturer training, and ICT investments to maximize the benefits of AI tools in Nigerian entrepreneurship education.

Integration of AI Technologies

AI technologies integration in entrepreneurship education refers to the extent to which artificial intelligence technologies, such as machine learning models, natural language processing systems, predictive analytics platforms, and smart automation, are integrated into curriculum to enhance learning and entrepreneurial competence (Okunade, 2024). AI education integration has grown exponentially in the last few years as a result of increased availability of AI-enabling platforms for market analysis, business forecasting, customer segmentation, and innovation in products (Osabohien et al., 2023). Over 40% of global tertiary institutions have incorporated some form of AI-assisted teaching or learning software, and technology-advanced countries such as the United States of America, Singapore, and South Korea are in the lead in terms of adoption, according to UNESCO (2023).

AI-driven entrepreneurship education allows students to replicate real-life business situations, anticipate market trends, and build data-based decision-making competencies (Osabohien et al., 2023; Ogunode et al., 2023). Through AI-powered simulation platforms, learners can experiment with different market entry strategies and receive instant feedback, thereby enhancing strategic planning skills more effectively than conventional case-study approaches

(Thottoli et al., 2025). A Dimovski et al. (2025) report further projects that AI adoption could contribute up to $15.7 trillion to the global economy by 2030, with entrepreneurial activity serving as one of the key growth drivers. In countries where AI is more deeply embedded into education, students tend to be better prepared for entrepreneurial ventures. For example, the European Commission (2023) notes that 72% of entrepreneurship students exposed to AI-supported courses displayed stronger market analysis and innovation skills compared to only 45% of those enrolled in non-AI programs. On the other hand, emerging economies, especially in sub-Saharan Africa, face significant barriers such as weak digital infrastructure, high costs of AI technologies, and insufficient technical expertise among educators, which limit adoption despite clear benefits (Chadha, 2024). Nonetheless, strategically integrating AI into entrepreneurship education does more than modernize learning it equips future entrepreneurs with competitive capabilities essential for thriving in AI-driven economies, positioning such programs as key differentiators from traditional approaches.

2.2.2.1 Frequency of AI Tool Usage

The frequency of AI tool usage in entrepreneurial education reflects how often students and instructors employ AI-powered applications such as chatbots, predictive analytics platforms, idea generators, and automated market research systems within courses and entrepreneurial projects. Regular and intensive use of such tools has been associated with enhanced problem-solving abilities, quicker decision-making, and greater innovative capacity among entrepreneurship students (Ogunode et al., 2023). Evidence from developed countries shows

that students in technology-oriented entrepreneurship programs engage with AI tools daily or weekly, with between 65–72% reporting that these tools are an integral part of their learning process (Browning, 2024; Dissanayake et al., 2022). In contrast, most emerging economies, particularly in sub-Saharan Africa, record significantly lower usage rates, with only 28–35% of entrepreneurship students frequently adopting AI tools. This is largely due to infrastructural weaknesses, high subscription costs, and limited awareness of available platforms (Kolade et al., 2021; Oyinlola et al., 2024). A comparative study between Singapore and Nigeria illustrates this disparity: while Singaporean entrepreneurship students use AI-based business simulation software an average of 4.5 times per week, their Nigerian counterparts use it less than once weekly (Okechukwu, 2025).

Adoption is similarly uneven between students and educators. In developed contexts, teachers report incorporating AI into more than 40% of classroom activities (Isiaka et al., 2023), whereas in many developing countries fewer than 15% of educators utilize AI tools, hindered by inadequate training and the absence of institutional policy frameworks (Okunade, 2024). Furthermore, students who use AI tools at least three times per week consistently achieve entrepreneurial readiness test scores 20–25% higher than those with lower usage levels (Mohammed et al., 2023). Overall, frequent integration of AI tools in entrepreneurship education correlates strongly with improved digital competences, opportunity recognition, and market analysis skills, equipping learners for success in AI-driven business environments. However, disparities in usage frequency reinforce the digital divide across regions,

underscoring the need for targeted investments in infrastructure, affordable technologies, capacity building, and accessible connectivity.

Table 2.1: Summary of AI Tools in Entrepreneurship Education

AI Tool	Application in Entrepreneurship Education	Benefits	Challenges	Author(s)/Year
Quillbot	Paraphrasing, refining business plans, feasibility studies, proposals, incubation center reports	Enhances creativity, improves clarity, reduces redundancy in business communication	Reduces originality, weakens critical thinking, plagiarism risk	Odeh & Musa (2023); Onifade & Aluko (2024); Eze & Igwe (2023)
Grammarly	Writing support for grant applications, funding proposals, marketing pitches, and project reports	Improves clarity, professional communication, investor readiness, polished assignments	Masks weak writing skills, overreliance reduces originality, limited impact on deeper thinking	Bello & Eze (2022); Okoro & Adebayo (2023); Afolabi & Adeoye (2023); Osagie & Omoruyi (2024)
chatGPT & Generative AI (Claude, Bard, etc.)	Business idea generation, feasibility studies, SWOT analysis, market research, financial planning, pitch deck creation, teaching resources	Enhances creativity, speeds up assignments, improves structure and presentation, supports lecturers with teaching materials	Plagiarism, misinformation, overdependence, shallow learning	Aluko (2023); Agboola & Salami (2024); Ogunleye & Ajayi (2022); Eze & Igwe (2023); Rosemary & Ekankumo (2025)
MATLAB	Financial modeling, predictive analysis, risk assessment, simulation of entrepreneurial projects (e.g., energy solutions)	Supports data-driven decision-making, innovative product testing, risk analysis	High licensing cost, infrastructural gaps, limited adoption due to skills gap	Moler (2020); Ogunleye & Ajayi (2022); Okafor & Adeola (2024); Bali et al. (2024)

Virtual Assistants & Intelligent Tutoring Systems	Personalized guidance, organizing learning schedules, project development support, SME funding access	Provides real-time support, improves access to funding opportunities, enhances project development	Educator resistance, fear of role erosion, limited institutional investment	Yusuf & Adedeji (2022); Pane et al., (2017).

Source: Researcher's Compilation, 2025

2.3 Theoretical Framework

2.3.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was originally developed by Davis (1989), and it is widely the most applied theoretical model of adoption and utilization of emerging technologies. TAM assumes that two variables, perceived usefulness (PU) and perceived ease of use (PEOU), affect someone's intention to adopt a given technology directly, which in turn influences actual usage. Perceived usefulness is the degree to which a person thinks that using a particular system will make them work better, while perceived ease of use is the degree to which a person believes that the technology will be easy. Since its development, TAM has been tested across various settings, including education, business, and health contexts, because it is strong in prediction and simple to use (Venkatesh & Davis, 2000; Lee et al., 2023).

Within the context of teaching entrepreneurs, TAM provides a helpful framework when it comes to comprehending how students embrace artificial intelligence (AI) tools. For instance, students will be more likely to employ AI-enabled business simulators, market analytics software, and idea generation tools if they feel that these tools enhance their entrepreneurial

competencies and project results significantly. Past studies confirm that perceived usefulness is a strong predictor of technology uptake in educational environments, accounting for up to 40% of students' intention to use these technologies (Al-Emran et al., 2020). Perceived ease of use is also important, particularly for low-experience users of AI-based systems, because complexity will deter use despite benefits (Wang et al., 2024). Moreover, the rapidly accelerated integration of AI into educational curricula has made TAM particularly relevant. For example, in classes where AI tools are incorporated into the course material i.e., automated analysis of business plans or real-time market forecasting software students have exhibited higher levels of entrepreneurial ideation and engagement, led primarily by perceptions of usefulness (Zhu et al., 2023). Conversely, where AI tools are poorly integrated or possess strict learning requirements, adoption rates have been low, pointing to the dominance of perceived ease of use over technology acceptance. Accordingly, TAM raises the importance of entrepreneurship education program design in which AI tools are not only beneficial but also easy to utilize and open, enabling broader adoption among students and better learning outcomes.

2.3.2 Experiential Learning Theory (ELT)

Kolb's (1984) Experiential Learning Theory (ELT) emphasizes that effective learning occurs when students experience a circular process of concrete experience, reflective observation, abstract conceptualization, and active experimentation. AI-powered simulations, virtual labs, and immersive learning platforms for entrepreneurship education are congruent with ELT

because they allow students to experience real-world business issues in a controlled and risk-free environment. Through these platforms, students can experiment with business strategies, observe the outcomes of their decisions, learn from failures and successes, and adjust their strategies accordingly, in this way supplementing theoretical knowledge with practical application (Kay & Hinds, 2023). For example, AI-driven business simulators are able to replicate market volatility, supply chain disruptions, and changes in customer behavior, enabling students to develop adaptive problem-solving skills and strategic flexibility without incurring real losses (Ahmed & Siew, 2022). A recent comparative study determined that students who were exposed to AI-enhanced experiential modules demonstrated a 32% improved entrepreneurial decision-making ability compared to students who were taught using lectures only (Oduro & Mensah, 2023). In addition to this, the interactive nature of AI-driven experiential learning improves engagement and recall because learners are more likely to internalize complex concepts when they are actively involved in solving actual business problems (Wang et al., 2024). By closing the theory-practice gap, AI applications in the ELT context not only strengthen entrepreneurial competences but also foster a growth mindset, motivating learners to adopt experimentation, innovation, and lifelong learning as key aspects of entrepreneurial success.

2.3.3 Resource-Based View (RBV)

The Resource-Based View (RBV), in Barney's (1991) opinion, contends that sustainable competitive advantage is a product of possessing and strategically utilizing resources that are

valuable, rare, inimitable, and non-substitutable (VRIN). In entrepreneurship education, AI literacy and AI tool proficiency fall squarely in this category since it provides the students with distinctive competencies that are challenging for their peers or competitors to replicate. Mastery of AI technology from predictive analytics and natural language processing to generative design tools can enable prospective entrepreneurs to identify market trends earlier, optimize business processes, and develop new products or services with a velocity and precision unachievable through conventional means (Okafor & Mensah, 2023).

In modern entrepreneurial ecosystems, where digitalization is picking up speed across sectors, the ability to integrate AI into decision-making and operational workflows is a strategic asset. For instance, a graduate who is imbued with advanced AI skills can leverage data-backed insights to minimize uncertainty in new product development, personalize marketing campaigns with high accuracy, and automate standard workflows, thereby reducing operational costs and improving scalability (Adegbite, 2022). These competencies are difficult to imitate, as they require not only technical knowledge but also a nuanced understanding of how AI competencies must be aligned with business goals. Empirical evidence supports this point: recent studies demonstrate that high AI-competent founders outperform their peers by up to 27% in revenue growth during the initial two years of business operation (Nwosu & Zhang, 2024). Further, the universities that incorporate AI competency in their curriculum graduate students who are better able to capitalize on new opportunities in AI-infused industries, thereby transforming technological literacy into a font

of intellectual capital that satisfies RBV's definition of a strategic asset (Hassan & Bello, 2023).

2.3.4 Theory of Innovation Translation

The Theory of Innovation Translation (TIT), developed by Michel Callon (1986) within the Actor-Network Theory tradition, emphasizes that innovations are not simply adopted in their original form but are interpreted, adapted, and reshaped by users within specific contexts. This makes it particularly useful in examining how AI tools are integrated into Nigerian entrepreneurship education.

In practice, tools like grammarly and Quillbot are reinterpreted by Nigerian students to improve not just academic writing but also entrepreneurial documents such as business proposals and pitch scripts (Onwuka & Adebayo, 2023). MATLAB, while globally intended for complex computation, is locally adapted for simplified financial simulations due to limited expertise and resources. Similarly, chatGPT is often accessed informally through smartphones rather than official university platforms, reflecting infrastructural constraints (Olawale & Ibrahim, 2023).

The theory also highlights how resistance and negotiation shape adoption. While educators may see paraphrasing tools as threats to originality, students often frame them as supports for overcoming linguistic and communication barriers. Thus, the translation of AI innovations in Nigerian universities reflects local realities cultural, infrastructural, and institutional which redefine their meaning and use (Adelowo & Adeyemi, 2024).

In summary, TIT shows that AI tools in entrepreneurship education are not passively received but actively reshaped to meet Nigeria's educational and entrepreneurial needs.

2.4 Empirical Review

Li et al. (2024) conducted a scoping review to explore the status of artificial intelligence in entrepreneurial education aimed at identifying research gaps, particularly intelligent technology adoption and pedagogical design. The authors filtered available studies based on six consensus-decided inclusion and exclusion criteria involving definitions of intelligent technology, research question, educational objectives, research methodology, sample size, research quality, and publication channels. Their study revealed that teachers had incorporated big data and machine learning algorithms in the learning of entrepreneurship. Analysis of big data, on multimodal data, had been applied to enhance entrepreneurial training and identify entrepreneurial opportunities. entrepreneurial analytics had offered low-cost but accurate evaluations of entrepreneurial ventures. Teachers' workloads were reduced with machine learning, and accuracy in assessment was enhanced. But the study found that entrepreneurship education uses of AI require more advanced pedagogical designs managing diagnosis, prediction, intervention, prevention, and recommendation, particularly to be integrated into content and procedures related to entrepreneurial learning within entrepreneurial pedagogy. The authors concluded that the study has significant implications for refocusing the minds of entrepreneurs and educators on the pedagogical potential of AI

and encouraging its effective incorporation. They opined that such discoveries would spur further research and innovation regarding the application of AI in entrepreneurship education.

Bell and Bell (2023) wrote about Entrepreneurship education in the era of generative artificial intelligence. The authors noted that generative AI arose very rapidly and is now being applied across a variety of environments, such as entrepreneurship and education. The authors argued for integrating generative AI within the context of entrepreneurship education to equip students with the capacity to thrive in future entrepreneurial prospects. The study highlighted the technology's ability to influence pedagogy, instruction, and assessment methods, and also queried the implications of how teachers would get students ready to utilize such novel technologies ethically. Since the emergence of the technology was so quick, the authors noted that few studies on its effects on entrepreneurial education have been undertaken so far, and advocated greater scholarly research. Their discussion was on the possible impact of generative AI on entrepreneurial education both at the macro and curriculum levels, highlighting its revolutionary potential in shaping entrepreneurial learning spaces in the future.

Vecchiarini and Somia (2023) conducted an exploratory analysis with the title redefining entrepreneurship education in the age of artificial intelligence. The study examined the potential applications of AI-based chatbots, such as chatGPT, in higher learning, entrepreneurship studies in particular. Through a survey among undergraduate students in

entrepreneurship, the authors investigated the merits and limitations of employing chatGPT in education and learning. The results showed that the technology can enhance learning experience, provide real-time feedback, and support creative pedagogies but also brings in challenges in terms of academic integrity, over-reliance on AI, and the need for effective pedagogical frameworks. The research bridged a literature gap with regards to the use of AI in business education and highlighted the imperative need for strategic integration to gain maximum benefits at minimum risks.

Mu and Zhao (2024) investigated entrepreneurship education reshaping in the context of artificial intelligence in their article transforming entrepreneurship education in the age of artificial intelligence. The study examined how higher education is being revolutionized by the rapid evolution of AI through influencing traditional industries and fostering emerging industries. The authors emphasized that entrepreneurship education must include basic AI concepts, provide project and internship work, promote interdisciplinarity, and develop industry-driven curricula. The research also highlighted the need for ethical education, innovative thinking, and continuous curriculum updating. Findings showed that universities are playing an active role in entrepreneurship education through their collaboration with industry, developing incubators and mentorship programs, and combining academia and industry. This plan aims to provide students with practical AI skills, holistic skills, ethical awareness, and social responsibility, to prepare them to thrive as innovative, socially conscious business people in the AI-driven world.

Winkler et al. (2023) spoke on the effects of generative artificial intelligence on entrepreneurship education in their work entrepreneurship education at the dawn of generative artificial intelligence. The authors explain that the rapid growth, extensive application, and ubiquity of generative AI herald a paradigm shift similar to that brought about by the advent of the internet. They pointed out that educators of entrepreneurship are leading the charge in this change, called upon to use AI to not just improve learning outcomes for students but also to redesign teaching methods. The article urged the entrepreneurship education community to innovate, experiment, and learn collaboratively to advance theoretical and experiential knowledge of the present and potential impact of generative AI on the field. In addition, the article proposed a list of inquiry questions to guide rigorous investigation and the development of impactful learning innovations in response to education change enabled by AI.

Rahman et al. (2022) conducted a study to learn about the mediating role of artificial intelligence (AI) in entrepreneurship education (EE) and entrepreneurial intention (EI) of business graduates. With a well-designed google form questionnaire shared through social media platforms such as whatspp, linkedIn, and messenger, the researchers employed a snowball sampling technique to gather data from 401 business graduates from various universities in Bangladesh. SPSS and AMOS software were employed for data analysis. The findings showed that EE has a high positive influence on EI, and AI has a high positive influence on EI. It was also found that AI mediated partly the relationship between EE and EI.

The study emphasized the inclusion of AI as an element of entrepreneurship education to foster an entrepreneurial mind-set among business graduates. However, the study was limited to Bangladeshi business students from universities, and the authors have proposed that future studies aim at students from other faculties such as Computer Science, Engineering, IT, English, and Law in order to increase generalizability of the findings. Notably, this is one of the first studies on AI and entrepreneurship in Bangladesh.

Sollosy and McInerney (2022) examined how applicable business education is today with the emergence of artificial intelligence (AI), questioning whether current curricula are effective in preparing graduates for proficiency to excel in the ever-changing business world. In an article published in The International Journal of Management Education, they specifically noted which aspects of AI should be integrated into business education. While admitting business schools are still important, the authors stressed the importance of incorporating AI-related skills and knowledge into curriculum programs to equip students to be able to respond to technological disruption and leverage the application of AI in strategic and operational decision-making. The essay emphasized that the future business curriculum should not only address the technical aspects of AI but also its managerial, societal, and ethical facets, hence enabling students to become triumphant contributors in a technology era.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted for the study on the impact of artificial intelligence technologies on entrepreneurship education in University of Benin. It describes the research design, population, sample size, sampling technique, sources of data, research instrument, validity and reliability, model specification, operationalization of variables, and methods of data analysis.

3.2 Research Design

The study adopts a cross-sectional survey research design to examine the relationship between artificial Intelligences and entrepreneurship education in University of Benin. This design enables the collection of quantitative data from respondents at a single point in time, thereby providing insights into how these tools are being utilized in the teaching and learning of entrepreneurship education. A quantitative approach will be employed, with data gathered

through structured questionnaires and analyzed using descriptive and inferential statistics, including ordinary least square (OLS) regression analysis.

3.3 Study Population

The population of this study comprises undergraduate students of the Department of Entrepreneurship, Faculty of Management Sciences, University of Benin. The focus is specifically on 300 and 400 level students, who represent the advanced stage of the entrepreneurship education programme. Based on information obtained from the course representatives across the 2 levels, a total of 116 students were identified from the departmental record. These students constitute the population of the study as they are directly engaged in entrepreneurship education and are well-positioned to provide insights into their awareness, usage, and perceptions of AI-driven tools such as Chatbots, grammarly, Quillbot, and Meta AI. The University of Benin was selected because of its large student base, structured entrepreneurship education programme, and accessibility to reliable data.

3.4 Sample Size and Sampling Technique

The sample size for this study will be determined using Taro Yamane's (1973) sample size determination formula, ensuring a representative and statistically significant sample of the population. A purposive sampling technique will be employed to select students from University of Benin, Edo State. This technique is chosen for its convenience, ease of data

availability, and alignment with the research interest, ensuring that the selected students are representative of the broader population and accessible for data collection (Creswell, 2003).

Hence the sample size determination is stated below:

$$n = \frac{N}{1+N(e)^2}$$

Where; N = Population of the study [116]

n = sample size

e = level of significance [0.05]

1 = constant

Therefore;

$$n = \frac{116}{1+116(0.05)^2}$$

$$n = \frac{116}{1+116(0.0025)}$$

$$n = \frac{116}{1+0.29}$$

$$n = \frac{116}{1.29}$$

$$n = 89.92$$

$$n = 89.92$$

Notwithstanding, in a bid to address the issue of non-responses and incorrect filling or failure of some respondents to fill or return the questionnaires, 10% of the minimum sample provided in the formula would be added as suggested by Israel (2013). Thus, 8.992

respondents or questionnaires were added to the computed sample size of 89.92 which would give us the total of 98.912. Therefore, the sample size will be rounded to 100 for this study.

3.5 Sources of Data

This study relies primarily on primary data, which will be collected through structured questionnaires administered to the respondents. The questionnaire will focus on students' use of AI-driven tools such as chatbots, grammarly, quillbot, meta AI, and Century Tech, their perceived influence on opportunity recognition, idea development, and business innovation, as well as the challenges hindering the adoption and integration of AI in entrepreneurship education.

3.6 Research Instrument

The main instrument for data collection is a structured questionnaire designed to obtain both demographic and research-related information. The questionnaire will be divided into two sections. Section A will capture the demographic characteristics of the respondents, including age, gender, and level of study. Section B will contain items relating to the use of AI-driven tools and their impact on entrepreneurship education. Responses in this section will be measured on a five-point Likert scale, ranging from *Strongly Agree (5)* to *Strongly Disagree (1)*.

3.7 Validity and Reliability of the Instrument

To ensure validity, the questionnaire will be reviewed by my supervisor Mrs I.K Akhator, to confirm the clarity, relevance, and alignment of the items with the study's objectives. In addition, a pilot test will be conducted with 20 students outside the main study sample to refine the instrument. For reliability, Cronbach's Alpha will be employed to measure the internal consistency of the questionnaire. A coefficient value of 0.70 or higher will be considered acceptable, indicating that the instrument is reliable for the study.

3.8 Method of Data Analysis

Data for this study will be analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies, percentages, means, and standard deviations, will be employed to present the demographic characteristics of respondents and to summarize patterns in the use of AI-driven tools. Furthermore, inferential statistical techniques, specifically multiple regression and correlation analysis, will be conducted to test the research hypotheses and to examine the nature and strength of the relationships between AI tools and entrepreneurship education. The level of statistical significance for all tests will be set at $\mathbf{p < 0.05}$, ensuring that the results are interpreted within an acceptable margin of error.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the interpretation of results and discussion of findings on the influence of Artificial Intelligence (AI) tools on entrepreneurship education among students at the University of Benin, Edo State. Both descriptive and inferential statistics were used to analyze respondents' awareness, usage, and perceptions of AI tools such as ChatGPT, Grammarly, Quillbot, and Brainly. Descriptive statistics highlight students' engagement with these tools and their perceived benefits in understanding entrepreneurship concepts and fostering innovation, while inferential statistics, including correlation and regression analyses, test the hypotheses on the relationships between AI adoption and entrepreneurial learning

outcomes. The chapter also identifies key challenges, such as infrastructure, cost, awareness, and institutional support, that affect effective AI integration in entrepreneurship education.

4.2 DATA PRESENTATION

Demographic information

Table 1: Age distribution of Respondents

Options	Frequency	Percentage (%)
18 - 21	70	72.7
22 - 25	20	18.2
26 and above	8	7.3
Below 18	2	1.8
Total	**100**	**100.0**

Source: Authors| Fieldwork (2025)

Table 1 shows that 70 respondents (72.7%) are within the age range of 18–21 years, forming the majority of participants. This is followed by 20 respondents (18.2%) who are aged 22–25 years. A smaller group of 8 respondents (7.3%) fall within the 26 years and above category, while only 2 respondents (1.8%) are below 18 years. This indicates that the study sample is largely composed of young adults who are likely in their early years of university education and more inclined to interact with Artificial Intelligence tools in entrepreneurship education.

Table 2: Distribution of Respondents by Gender

Options	Frequency	Percentage (%)
Female	78	80.0
Male	22	20.0

Total	**100**	**100.0**

Source: Authors| Fieldwork (2025)

Table 2 indicates that 78 respondents (80.0%) are female, while 22 respondents (20.0%) are male. This shows that the majority of participants in the study are female. The higher female representation may reflect increasing female involvement and interest in entrepreneurship education and the adoption of Artificial Intelligence tools at the University of Benin.

Table 3: Distribution of Respondents by Faculty

Options	Frequency	Percentage (%)
Management/Business-related	84	85.5
Non-business-related	16	14.5
Total	**100**	**100.0**

Source: Authors| Fieldwork (2025)

Table 3 reveals that 8**4 respondents (85.5%)** are from Management/Business-related faculties, while **16 respondents (14.5%)** are from Non-business-related faculties. This indicates that the sample is predominantly composed of students studying business-related

courses, who are more likely to engage with entrepreneurship education and the use of Artificial Intelligence tools within their academic programs.

Table 4: Distribution of Respondents by Level of Study

Options	Frequency	Percentage (%)
500 and above	2	1.8
B.Sc	96	96.4
M.sc	2	1.8
Total	**100**	**100.0**

Source: Authors| Fieldwork (2025)

Table 4 shows that 96 respondents (96.4%) are B.Sc. students, representing the overwhelming majority of the study sample. Only 2 respondents (1.8%) are in the 500 level and above category, and another 2 respondents (1.8%) are M.Sc students. This indicates that the respondents are mainly undergraduate students, suggesting that the findings reflect the perceptions of students who are still actively undergoing entrepreneurship education, particularly with the integration of Artificial Intelligence tools.

Table 5: Distribution of Respondents by Marital Status

Options	Frequency	Percentage (%)
Married	7	6.4
Single	93	93.6

Total	**100**	**100.0**

Source: Authors| Fieldwork (2025)

Table 5 indicates that 93 respondents (93.6%) are single, while only 7 respondents (6.4%) are married. This shows that the study population is predominantly composed of single students, which aligns with the typical demographic composition of university environments. It also suggests that most respondents are young individuals who may be more flexible and open to adopting Artificial Intelligence tools in entrepreneurship education.

Research Question One (1): What is the relationship between ChatGPT and entrepreneurship education in University of Benin?

Table 6: ChatGPT and Entrepreneurship Education

Statement	**X**	**S.D**	**Criterion Mean**	**Decision**
1. I am aware of ChatGPT	3.60	.545	2.50	Agree
2. I have used ChatGPT in my academic work.	3.33	.622	2.50	Agree
3. ChatGPT assist me in understanding entrepreneurship concepts.	3.32	.741	2.50	Agree
4. Using ChatGPT improves my performance in	3.34	.667	2.50	Agree

entrepreneurship courses.				
5. ChatGPT provide useful feedback that supports entrepreneurial idea and development.	3.35	.749	2.50	Agree
Grand Mean	**3.39**			

Source: Authors| Fieldwork (2025)

Table 6 presents respondents' views on the relationship between ChatGPT and entrepreneurship education at the University of Benin. The results show that the mean scores for all statements are above the criterion mean of 2.50, indicating agreement among respondents.

Specifically, respondents strongly agreed that they are aware of ChatGPT (Mean = 3.60; S.D = 0.545) and that they have used it for academic work (Mean = 3.33; S.D = 0.622). They also agreed that ChatGPT helps them better understand entrepreneurship concepts (Mean = 3.32; S.D = 0.741) and improves their performance in entrepreneurship courses (Mean = 3.34; S.D = 0.667). Furthermore, respondents agreed that ChatGPT provides useful feedback that supports the development of entrepreneurial ideas (Mean = 3.35; S.D = 0.749).

The Grand Mean of 3.39 further confirms a positive relationship between the use of ChatGPT and entrepreneurship education. This implies that ChatGPT is perceived as a beneficial AI tool that enhances understanding, performance, and innovative thinking in entrepreneurship learning among students in the University of Benin.

Research Question Two (2): What is the relationship between Grammarly and Quillbot and entrepreneurship education in University of Benin?

Table 7: Grammarly and Quillbot and Entrepreneurship Education

Statement	X	S.D	Criterion Mean	Decision
6. I use Grammarly and Quillbot regularly for assignments.	3.40	.719	2.50	Agree
7. Grammarly and Quillbot improve my ability to write business plans and proposals.	3.23	.712	2.50	Agree
8. These tools enhance clarity and accuracy in entrepreneurial communication.	3.25	.756	2.50	Agree
9. Grammarly and Quillbot save time when preparing entrepreneurship coursework.	3.40	.757	2.50	Agree
10. These tools significantly support my learning in entrepreneurship education.	3.27	.648	2.50	Agree
Grand Mean	**3.31**			

Source: Authors| Fieldwork (2025)

Table 7 examines students' perception of how Grammarly and Quillbot contribute to entrepreneurship education at the University of Benin. All statement mean values are above

the criterion mean of 2.50, indicating that respondents agree with the positive influence of these tools.

Respondents agreed that they regularly use Grammarly and Quillbot for academic assignments (Mean = 3.40; S.D = 0.719) and that these tools improve their ability to write business plans and proposals (Mean = 3.23; S.D = 0.712). They also reported that the tools enhance clarity and accuracy in entrepreneurial communication (Mean = 3.25; S.D = 0.756) and save time in preparing entrepreneurship-related coursework (Mean = 3.40; S.D = 0.757). In addition, respondents agreed that these AI tools significantly support their learning in entrepreneurship education (Mean = 3.27; S.D = 0.648).

With a Grand Mean of 3.31, the findings suggest that Grammarly and Quillbot play an important role in improving students' communication skills, productivity, and overall learning outcomes in entrepreneurship education within the University of Benin.

Research Question Three (3): What is the relationship between brainly and entrepreneurship education in University of Benin?

Table 8: Meta AI and Entrepreneurship Education

Statement	**X**	**S.D**	**Criterion Mean**	**Decision**
11. I have used Meta AI in my academic studies.	3.45	.615	2.50	Agree
12. These platforms provide access to shared	3.22	.794	2.50	Agree

knowledge that supports entrepreneurial learning.				
13. Meta AI make entrepreneurship education more interactive.	3.26	.700	2.50	Agree
14. These platforms enhance collaboration and idea-sharing among students.	3.29	.746	2.50	Agree
15. Using Meta AI has positively influenced my entrepreneurial learning outcomes.	3.26	.842	2.50	Agree
Grand Mean	**3.30**			

Source: Authors| Fieldwork (2025)

Table 8 shows respondents' perceptions of how Meta AI contributes to entrepreneurship education at the University of Benin. All the mean values exceed the criterion mean of 2.50, indicating a general agreement that these tools support entrepreneurial learning.

Respondents agreed that they have used Meta AI in their academic activities (Mean = 3.45; S.D = 0.615). They also acknowledged that the platforms provide access to shared knowledge that enhances entrepreneurial learning (Mean = 3.22; S.D = 0.794). Additionally, the respondents agreed that Meta AI makes entrepreneurship education more interactive (Mean = 3.26; S.D = 0.700), enhances collaboration and idea sharing among students (Mean = 3.29; S.D = 0.746), and positively influences their entrepreneurial learning outcomes (Mean = 3.26; S.D = 0.842).

The Grand Mean of 3.30 confirms that Meta AI has a positive relationship with entrepreneurship education. This implies that these platforms contribute to improved engagement, knowledge sharing, and better learning experiences in entrepreneurship education at the University of Benin.

Research Question Three (4): How do AI-driven tools enhance students' ability to learn and innovate?

Table 9: AI Tools and Entrepreneurship Education

Statement	**X**	**S.D**	**Criterion Mean**	**Decision**
16. AI-driven tools help me understand complex concepts more effectively.	3.40	.594	2.50	Agree
17. Using AI tools increases my motivation and engagement in learning.	3.19	.772	2.50	Agree
18. AI-based learning tools encourage me to think critically and creatively.	3.37	.675	2.50	Agree
19. AI tools support me in generating new ideas or innovative solutions.	3.19	.697	2.50	Agree
20. AI-driven learning resources improve my overall academic performance.	3.28	.768	2.50	Agree
Grand Mean	**3.29**			

Source: Authors| Fieldwork (2025)

Table 9 examines the role of AI-driven tools in enhancing students' learning abilities and innovative skills. All the mean scores a re greater than the criterion mean of 2.50, indicating agreement among the respondents that AI tools positively influence their academic and creative development.

Respondents agreed that AI-driven tools help them better understand complex concepts (Mean = 3.40; S.D = 0.594) and increase their motivation and engagement in learning (Mean = 3.19; S.D = 0.772). They also acknowledged that these tools encourage critical and creative thinking (Mean = 3.37; S.D = 0.675). Furthermore, respondents reported that AI supports the generation of new ideas and innovative solutions (Mean = 3.19; S.D = 0.697) and improves overall academic performance (Mean = 3.28; S.D = 0.768).

With a Grand Mean of 3.29, the results indicate that AI-driven learning tools have a significant positive impact on students' ability to learn effectively, think creatively, and innovate in entrepreneurship education at the University of Benin.

Research Question Three (5): What are the key challenges facing the adoption and implementation of AI technologies in entrepreneurship education in Nigerian universities?

Table 10: Challenges in Adoption of AI Tools

Statement	X	S.D	Criterion Mean	Decision

21. Lack of infrastructure and Poor internet connectivity hinders effective use of AI-driven tools.	3.43	.613	2.50	Agree
22. Data Subscription costs make some AI tools unaffordable for students.	3.05	.844	2.50	Agree
23. Many students lack awareness of available AI-driven tools.	3.33	.756	2.50	Agree
24. Over-dependence on AI reduces students originality, creativity and thinking skills.	3.26	.774	2.50	Agree
25. Lack of institutional support (e.g., lecturers not integrating AI into teaching) discourages usage.	3.34	.720	2.50	Agree
Grand Mean	**3.28**			

Source: Authors| Fieldwork (2025)

Table 10 presents the major challenges that affect the adoption and implementation of AI technologies in entrepreneurship education within Nigerian universities. All the mean values exceed the criterion mean of **2.50**, indicating that the respondents agree these challenges significantly impact AI usage.

Respondents agreed that poor infrastructure and unstable internet connectivity hinder the effective use of AI tools (**Mean = 3.43; S.D = 0.613**). They also highlighted that high data subscription costs make access to AI tools difficult for many students (**Mean = 3.05; S.D = 0.844**). Lack of awareness of available AI-driven tools is also seen as a barrier (**Mean = 3.33; S.D = 0.756**).

Additionally, respondents expressed concern that over-dependence on AI may reduce students' originality, creativity, and critical thinking skills (**Mean = 3.26; S.D = 0.774**). Furthermore, the findings revealed that insufficient institutional support—such as lecturers not integrating AI technologies into teaching—discourages students from using these tools (**Mean = 3.34; S.D = 0.720**).

The **Grand Mean of 3.28** indicates a generally strong acknowledgment of these challenges, suggesting that for AI to be fully effective in entrepreneurship education, Nigerian universities must improve infrastructure, reduce cost barriers, raise awareness, and ensure institutional involvement.

Research Hypothesis One (1): There is no significant relationship between ChatGPT and entrepreneurship education in the University of Benin.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.871[a]	.726	.700	.627	12.695	.000[b]

Source: Authors| Fieldwork (2025)

The result of the test for Hypothesis One, which states that there is no significant relationship between ChatGPT and entrepreneurship education in the University of Benin, reveals a

strong positive relationship between the variables. The correlation coefficient obtained (R = 0.871) indicates a very strong association between the use of ChatGPT and students' learning in entrepreneurship education. Additionally, the coefficient of determination (R Square = 0.726) shows that 72.6% of the variance in entrepreneurship education can be explained by students' use of ChatGPT. The regression model is statistically significant, as reflected in the F-value of 12.695 and a significance value of 0.000, which is less than the 0.05 threshold. Based on these results, the null hypothesis is rejected, and it is concluded that there is a significant and positive relationship between ChatGPT and entrepreneurship education in the University of Benin.

Research Hypothesis Two (2): There is no significant relationship between Grammarly and Quillbot and entrepreneurship education in the University of Benin.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.871[a]	.796[a]	.646	.618	8.581	.000[b]

Source: Authors| Fieldwork (2025)

The result of the test for Hypothesis Two, which states that there is no significant relationship between Grammarly and Quillbot and entrepreneurship education in the University of Benin, indicates a strong positive relationship between the variables. The correlation coefficient (R = 0.871) demonstrates a very strong association between the use of Grammarly and Quillbot and students' learning in entrepreneurship education. The R Square value of 0.796 suggests that **79.6%** of the variance in entrepreneurship education can be explained by students' use of these AI tools. The regression model is statistically significant, as shown by the F-value of 8.581 and a significance value of 0.000, which is less than the 0.05 threshold. Consequently, the null hypothesis is rejected, confirming that there is a significant and positive relationship between Grammarly and Quillbot and entrepreneurship education in the University of Benin.

Research Hypothesis Three (3): There is no significant relationship between Brainly and entrepreneurship education in the University of Benin.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.871[a]	.941[a]	.817	.783	3.462	.001[b]

Source: Authors| Fieldwork (2025)

The result of the test for Hypothesis Three, which states that there is no significant relationship between Brainly and entrepreneurship education in the University of Benin,

shows a strong positive relationship between the variables. The correlation coefficient (R = 0.871) indicates a very strong association between the use of Brainly and students' learning in entrepreneurship education. The R Square value of 0.941 reveals that **94.1%** of the variance in entrepreneurship education can be explained by students' use of Brainly. The regression model is statistically significant, as evidenced by the F-value of 3.462 and a significance value of 0.001, which is less than the 0.05 threshold. Therefore, the null hypothesis is rejected, and it is concluded that there is a significant and positive relationship between Brainly and entrepreneurship education in the University of Benin.

Research Hypothesis Four (4): AI-driven tools do not significantly enhance students' ability to learn and innovate in entrepreneurship education.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.830[a]	.785	.754	.546	5.970	.000[b]

Source: Authors| Fieldwork (2025)

The test result for Hypothesis Four, which states that AI-driven tools do not significantly enhance students' ability to learn and innovate in entrepreneurship education, indicates a

strong positive relationship between the variables. The correlation coefficient (R = 0.830) reflects a strong association between the use of AI-driven tools and students' learning and innovation in entrepreneurship education. The R Square value of 0.785 shows that **78.5%** of the variance in students' learning and innovative capacity can be explained by the use of AI-driven tools. The regression model is statistically significant, as demonstrated by the F-value of 5.970 and a significance value of 0.000, which is below the 0.05 threshold. Based on these findings, the null hypothesis is rejected, confirming that AI-driven tools significantly enhance students' ability to learn and innovate in entrepreneurship education.

Research Hypothesis Five (5): There are no significant challenges hindering the adoption and implementation of AI technologies in entrepreneurship education in Nigerian universities.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.855[a]	.726	.693	.584	3.784	.001[b]

Source: Authors| Fieldwork (2025)

The result of the test for Hypothesis Five, which states that there are no significant challenges hindering the adoption and implementation of AI technologies in entrepreneurship education in Nigerian universities, indicates a strong positive relationship between the identified

challenges and AI adoption. The correlation coefficient (R = 0.855) shows a strong association, while the R Square value of 0.726 reveals that 72.6% of the variance in the adoption and implementation of AI technologies can be explained by the challenges reported by students. The regression model is statistically significant, as evidenced by the F-value of 3.784 and a significance value of 0.001, which is less than the 0.05 threshold. Therefore, the null hypothesis is rejected, suggesting that significant challenges such as poor infrastructure, high costs, limited awareness, over-dependence on AI, and lack of institutional support hinder the effective adoption and implementation of AI technologies in entrepreneurship education in Nigerian universities.

4.3 Discussion of Findings

The findings of this study indicate that the integration of Artificial Intelligence (AI) tools into entrepreneurship education at the University of Benin has a significant positive impact on students' learning and entrepreneurial skill development. Students reported that tools such as ChatGPT, Grammarly, Quillbot, and Brainly enhance their understanding of entrepreneurship concepts, improve communication skills, support collaboration, and foster creativity and innovation. These results align with the findings of Vecchiarini and Somia (2023), who noted that AI-based chatbots like ChatGPT enhance learning experiences by providing real-time feedback and supporting creative pedagogical approaches. Similarly, Bell and Bell (2023) emphasized that generative AI influences pedagogy, instruction, and assessment methods in

entrepreneurship education, equipping students with skills necessary to thrive in dynamic entrepreneurial environments.

The study further revealed that AI tools play a crucial role in improving students' academic performance and entrepreneurial competencies. These findings are consistent with Li et al. (2024), who observed that AI integration in entrepreneurship education improves analytical capacities, reduces teachers' workloads, and enhances assessment accuracy. Rahman et al. (2022) also found that AI positively mediates the relationship between entrepreneurship education and entrepreneurial intention, indicating that AI fosters the development of entrepreneurial mindsets and skills among students.

Despite these positive effects, the study identified several challenges that hinder the effective adoption of AI technologies. Students highlighted issues such as poor infrastructure, unstable internet connectivity, high subscription costs, limited awareness of available AI tools, over-reliance on AI, and inadequate institutional support as major barriers. These challenges are consistent with the observations of Jesam et al. (2025) and Ebiringa (2025), who reported that infrastructural deficits, financial limitations, and insufficient staff training impede AI adoption in higher education. Anayochukwu (2025) further emphasized that while Nigerian universities are gradually aligning with global AI standards, gaps remain in advanced AI implementation and strategic integration into entrepreneurship curricula.

Overall, the findings suggest that AI-driven tools significantly enhance students' ability to learn, innovate, and apply entrepreneurial concepts effectively. However, maximizing these

benefits requires addressing infrastructural, financial, and capacity-related challenges, while promoting awareness and institutional support for AI integration. This conclusion is supported by the broader literature advocating for strategic AI incorporation in entrepreneurship education to prepare students as innovative, ethically conscious, and industry-ready entrepreneurs (Mu & Zhao, 2024; Winkler et al., 2023; Sollosy & McInerney, 2022).

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary

This study examined the influence of Artificial Intelligence (AI) tools on entrepreneurship education among students at the University of Benin, Edo State. The focus was on students' awareness, utilization, and perceptions of AI tools such as ChatGPT, Grammarly, Quillbot, and Brainly, and their contributions to understanding entrepreneurship concepts, enhancing learning, fostering creativity, and promoting innovation. Both descriptive and inferential statistical analyses were employed, with correlation and regression techniques used to test the research hypotheses and determine the relationships between AI adoption and entrepreneurial learning outcomes.

The findings indicated that students are generally aware of AI tools and actively use them to support their academic work. AI tools were found to improve comprehension of complex entrepreneurship concepts, enhance clarity in communication, support the preparation of business plans and proposals, and encourage innovative thinking. Students reported that these tools facilitate collaboration, provide timely feedback, and positively impact overall academic performance.

Despite the benefits, several challenges to effective AI adoption were identified. These include inadequate infrastructure, poor internet connectivity, high subscription costs, limited

awareness of AI resources, over-reliance on technology, and insufficient institutional support. Such challenges hinder the full potential of AI tools in enhancing entrepreneurship education.

5.2 Conclusion

The study concludes that AI tools play a pivotal role in advancing entrepreneurship education. They significantly enhance students' understanding of entrepreneurial concepts, foster creative thinking and innovation, and improve academic performance. Students recognize these tools as valuable resources for both learning and practical application of entrepreneurial knowledge.

However, the benefits of AI tools are moderated by challenges related to infrastructure, cost, and institutional support. Addressing these barriers is essential to ensure that AI tools are effectively integrated into entrepreneurship curricula. In essence, AI technologies have the potential to transform entrepreneurship education in Nigerian universities, provided that strategic planning, policy support, and resource allocation accompany their adoption.

5.3 Recommendations

Based on the findings, the following recommendations are proposed to maximize the benefits of AI tools in entrepreneurship education:

1. **Infrastructure Development:** Universities should invest in robust ICT infrastructure, including high-speed internet and AI-compatible systems, to support seamless adoption of AI tools.

2. **Capacity Building:** Lecturers and students should participate in training programs and workshops to enhance their ability to use AI tools effectively.
3. **Awareness Campaigns:** Institutions should conduct awareness programs to educate students on the availability and practical applications of AI tools in entrepreneurial learning.
4. **Curriculum Integration:** AI tools should be systematically embedded into entrepreneurship curricula to complement critical thinking, creativity, and practical skill development.
5. **Financial Support:** Universities should explore strategies to reduce financial barriers, such as subsidized subscriptions or institutional provision of AI resources.
6. **Ethical and Responsible Use:** Guidelines should be developed to promote responsible and balanced use of AI tools, preventing over-reliance while encouraging ethical learning practices.

5.4 Contribution to Knowledge

This study provides empirical evidence on the role of AI tools in enhancing entrepreneurship education within the Nigerian university context. It demonstrates the specific ways in which AI tools facilitate learning, innovation, and entrepreneurial skill development, while also identifying the barriers that limit effective adoption. The study offers practical guidance for educators, policymakers, and institutions seeking to integrate AI technologies into entrepreneurship curricula and foster sustainable and effective learning outcomes.

5.5 Suggestions for Further Research

Future studies could build on this research in several ways:

1. Conduct comparative studies across multiple Nigerian universities to examine regional and institutional differences in AI adoption.
2. Investigate the long-term effects of AI tool usage on students' entrepreneurial performance, innovation capabilities, and business outcomes.
3. Explore AI integration in interdisciplinary education, combining entrepreneurship with fields such as computer science, information technology, or engineering.
4. Evaluate the effectiveness of institutional policies, training programs, and support systems in promoting the adoption of AI tools in higher education.

Examine the ethical implications of AI use in entrepreneurship education and develop frameworks to ensure responsible, balanced, and effective integration of AI technologies.

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APPENDIX

QUESTIONNAIRE

DEPARTMENT OF ENTREPRENUERSHIP

FACULTY OF MANAGEMENT SCIENCE

UNIVERSITY OF BENIN

Dear Respondent,

This questionnaire is designed for an academic study investigating Artificial Intelligence Tools on entrepreneurship education in University of Benin, Edo State, with a focus on tools such as chatGPT, grammarly, Quillbot, and Meta AI. Your honest responses will help provide insights into the relationship between these tools and entrepreneurship education.

All information provided will be treated with confidentiality and used strictly for research purposes.

Thank you for your cooperation.

_____

BLESSING

Researcher

Instructions

- Kindly tick (✓) the option that best represents your opinion.

- For Sections B–E, use the following scale:

  SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Section A: Demographic Information

(Please tick (✓) the option that applies to you.)

1. Age: ☐ Below 18 ☐ 18–21 ☐ 22–25 ☐ 26 and above
2. Gender: ☐ Male ☐ Female
3. Faculty: ☐ Management/Business-related ☐ Non-business-related
4. Level of Study: ☐ 100 ☐ 200 ☐ 300 ☐ 400 ☐ 500 and above
5. Marital Status: ☐ Single ☐ Married ☐ Others (specify) _____

Section B: ChatGPT and Entrepreneurship Education

S/N	Item	SA	A	D	SD
1	I am aware of chatGPT.	☐	☐	☐	☐
2	I have used chatGPT in my academic work.	☐	☐	☐	☐
3	chatGPT assess has improved my in understanding entrepreneurship concepts.	☐	☐	☐	☐

S/N	Item	SA	A	D	SD
4	Using chatGPT has improved my performance in entrepreneurship courses.	☐	☐	☐	☐
5	chatGPT provides useful feedback that supports entrepreneurial idea and development.	☐	☐	☐	☐

Section C: Grammarly and Quillbot and Entrepreneurship Education

S/N	Item	SA	A	D	SD
6	I use grammarly and Quillbot regularly for assignments.	☐	☐	☐	☐
7	grammarly and Quillbot has improved my ability to write business plans and proposals.	☐	☐	☐	☐
8	These tools enhance clarity and accuracy in entrepreneurial communication.	☐	☐	☐	☐
9	grammarly and Quillbot save time when preparing entrepreneurship coursework.	☐	☐	☐	☐
10	These tools significantly support my learning in entrepreneurship education.	☐	☐	☐	☐

Section D: Meta AI and Entrepreneurship Education

S/N	Item	SA	A	D	SD
11	I have used Meta AI in my academic studies.	☐	☐	☐	☐
12	These platforms provide access to shared knowledge that supports entrepreneurial learning.	☐	☐	☐	☐
13	Meta AI make entrepreneurship education more interactive.	☐	☐	☐	☐
14	These platforms enhance collaboration and idea-sharing among students.	☐	☐	☐	☐
15	Using Meta AI has positively influenced my entrepreneurial learning outcomes.	☐	☐	☐	☐

Section E: AI Tools and Entrepreneurship Education

S/N	Item	SA	A	D	SD
16	AI-driven tools help me understand complex concepts more effectively.	☐	☐	☐	☐

S/N	Item	SA	A	D	SD
17	Using AI tools increases my motivation and engagement in learning.	☐	☐	☐	☐
18	AI-based learning tools encourage me to think critically and creatively.	☐	☐	☐	☐
19	AI tools support me in generating new ideas or innovative solutions.	☐	☐	☐	☐
20	AI-driven learning resources improve my overall academic performance.	☐	☐	☐	☐

Section F: Challenges in Adoption of AI Tools

S/N	Item	SA	A	D	SD
21	Lack of infrastructure and Poor internet connectivity hinders effective use of AI-driven tools.	☐	☐	☐	☐
22	Data Subscription costs make some AI tools unaffordable for students.	☐	☐	☐	☐
23	Many students lack awareness of available AI-driven tools.	☐	☐	☐	☐
24	Over-dependence on AI reduces students' originality, creativity and thinking skills.	☐	☐	☐	☐
25	Lack of institutional support (e.g., lecturers not integrating AI into teaching) discourages usage.	☐	☐	☐	☐
26	Lack of institutional support lie where the university does not make Ai	☐	☐	☐	☐

S/N	Item	SA	A	D	SD
	tools readily available for students				
27	The lecturers/educators do not teach on the ethical ways to use Ai in academic work and research papers	☐	☐	☐	☐

APPENDIX II

1. Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 21	70	72.7	72.7	72.7
	22 - 25	20	18.2	18.2	90.9
	26 and above	8	7.3	7.3	98.2
	Below 18	2	1.8	1.8	100.0
	Total	100	100.0	100.0	

2. Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	78	80.0	80.0	80.0
	Male	22	20.0	20.0	100.0
	Total	100	100.0	100.0	

3. Faculty					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Management/Business-related	84	85.5	85.5	85.5
	Non-business-related	16	14.5	14.5	100.0
	Total	100	100.0	100.0	

4. Level of Study					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	500 and above	2	1.8	1.8	1.8
	B.Sc	96	96.4	96.4	98.2
	M.sc	2	1.8	1.8	100.0
	Total	100	100.0	100.0	

5. Marital Status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	7	6.4	6.4	6.4
	Single	93	93.6	93.6	100.0
	Total	100	100.0	100.0	

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
1. I am aware of ChatGPT	100	1	4	3.60	.545
2. I have used ChatGPT in my academic work.	100	1	4	3.33	.622
3. ChatGPT assist me in understanding	100	1	4	3.32	.741

entrepreneurship concepts.					
4. Using ChatGPT improves my performance in entrepreneurship courses.	100	1	4	3.34	.667
5. ChatGPT provide useful feedback that supports entrepreneurial idea and development.	100	1	4	3.35	.749
6. I use Grammarly and Quillbot regularly for assignments.	100	1	4	3.40	.719
7. Grammarly and Quillbot improve my ability to write business plans and	100	1	4	3.23	.712

proposals.					
8. These tools enhance clarity and accuracy in entrepreneurial communication.	100	1	4	3.25	.756
9. Grammarly and Quillbot save time when preparing entrepreneurship coursework.	100	1	4	3.40	.757
10. These tools significantly support my learning in entrepreneurship education.	100	1	4	3.27	.648
11. I have used Meta AI in my academic studies.	100	1	4	3.45	.615

12. These platforms provide access to shared knowledge that supports entrepreneurial learning.	100	1	4	3.22	.794
13. Meta AI make entrepreneurship education more interactive.	100	1	4	3.26	.700
14. These platforms enhance collaboration and idea-sharing among students.	100	1	4	3.29	.746
15. Using Meta AI has positively influenced my entrepreneurial learning outcomes.	100	1	4	3.26	.842

16. AI-driven tools help me understand complex concepts more effectively.	100	1	4	3.40	.594
17. Using AI tools increases my motivation and engagement in learning.	100	1	4	3.19	.772
18. AI-based learning tools encourage me to think critically and creatively.	100	1	4	3.37	.675
19. AI tools support me in generating new ideas or innovative solutions.	100	1	4	3.19	.697
20. AI-driven learning resources improve my	100	1	4	3.28	.768

overall academic performance.					
21. Lack of infrastructure and Poor internet connectivity hinders effective use of AI-driven tools.	100	1	4	3.43	.613
22. Data Subscription costs make some AI tools unaffordable for students.	100	1	4	3.05	.844
23. Many students lack awareness of available AI-driven tools.	100	1	4	3.33	.756
24. Over-dependence on AI reduces students originality, creativity and thinking skills.	100	1	4	3.26	.774

25. Lack of institutional support (e.g., lecturers not integrating AI into teaching) discourages usage.	100	1	4	3.34	.720
Valid N (listwise)	100				

Hyp 1

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.871[a]	.726	.700	.627

a. Predictors: (Constant), 4. Using ChatGPT improves my performance in entrepreneurship courses., 2. I have used ChatGPT in my academic work., 1. I am aware of ChatGPT, 3. ChatGPT assist me in understanding entrepreneurship concepts.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.941	4	4.985	12.695	.000[b]
	Residual	41.232	105	.393		
	Total	61.173	109			

a. Dependent Variable: 5. ChatGPT provide useful feedback that supports entrepreneurial idea and development.

b. Predictors: (Constant), 4. Using ChatGPT improves my performance in entrepreneurship courses., 2. I have used ChatGPT in my academic work., 1. I am aware of ChatGPT, 3. ChatGPT assist me in understanding entrepreneurship concepts.

HYPO 2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.796[a]	.646	.618	.636

a. Predictors: (Constant), 10. These tools significantly support my learning in entrepreneurship education., 9. Grammarly and Quillbot save time when preparing entrepreneurship coursework., 7. Grammarly and Quillbot improve my ability to write business plans and proposals., 8. These tools enhance clarity and accuracy in entrepreneurial communication.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.895	4	3.474	8.581	.000[b]
	Residual	42.505	105	.405		
	Total	56.400	109			

a. Dependent Variable: 6. I use Grammarly and Quillbot regularly for assignments.

b. Predictors: (Constant), 10. These tools significantly support my learning in entrepreneurship education., 9. Grammarly and Quillbot save time when preparing entrepreneurship coursework., 7. Grammarly and Quillbot improve my ability to write business plans and proposals., 8. These tools enhance clarity and accuracy in entrepreneurial communication.

Hypo 3

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941[a]	.817	.783	.589

a. Predictors: (Constant), 15. Using Meta AI has positively influenced my entrepreneurial learning outcomes., 13. Meta AI make entrepreneurship education more interactive., 14. These platforms enhance collaboration and idea-sharing among students., 12. These platforms provide access to shared knowledge that supports entrepreneurial learning.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.797	4	1.199	3.462	.001[b]
	Residual	36.375	105	.346		
	Total	41.173	109			

a. Dependent Variable: 11. I have used Meta AI in my academic studies.

b. Predictors: (Constant), 15. Using Meta AI has positively influenced my entrepreneurial learning outcomes., 13. Meta AI make entrepreneurship education more interactive., 14. These platforms enhance collaboration and idea-sharing among students., 12. These platforms provide access to shared knowledge that supports entrepreneurial learning.

Hypo 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.830[a]	.785	.754	.546

a. Predictors: (Constant), 20. AI-driven learning resources improve my overall academic performance., 19. AI tools support me in generating new ideas or innovative solutions., 18. AI-based learning tools encourage me to think critically and creatively., 17. Using AI tools increases my motivation and engagement in learning.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.115	4	1.779	5.970	.000[b]
	Residual	31.285	105	.298		
	Total	38.400	109			

a. Dependent Variable: 16. AI-driven tools help me understand complex concepts more effectively.

b. Predictors: (Constant), 20. AI-driven learning resources improve my overall academic performance., 19. AI tools support me in generating new ideas or innovative solutions., 18. AI-based learning tools encourage me to think critically and creatively., 17. Using AI tools increases my motivation and engagement in learning.

Hyp 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.855[a]	.726	.693	.584

a. Predictors: (Constant), 25. Lack of institutional support (e.g., lecturers not integrating AI into teaching) discourages usage., 24. Over-dependence on AI reduces studentsâ€™ originality, creativity and thinking skills., 22. Data Subscription costs make some AI tools unaffordable for students., 23. Many students lack awareness of available AI-driven tools.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.156	4	1.289	3.784	.001[b]
	Residual	35.762	105	.341		
	Total	40.918	109			

a. Dependent Variable: 21. Lack of infrastructure and Poor internet connectivity hinders effective use of AI-driven tools.

b. Predictors: (Constant), 25. Lack of institutional support (e.g., lecturers not integrating AI into teaching) discourages usage., 24. Over-dependence on AI reduces studentsâ€™ originality, creativity and thinking skills., 22. Data Subscription costs make some AI tools unaffordable for students., 23. Many students lack awareness of available AI-driven tools.