

**INTEGRATION OF AI TOOLS IN BUSINESS EDUCATION CLASSROOM FOR
TEACHING AND LEARNING PROCESS IN TERTIARY INSTITUTIONS**

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**A RESEARCH WORK SUBMITTED TO THE DEPARTMENT OF BUSINESS
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NOVEMBER, 2025

APPROVAL PAGE

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DEDICATION

This research work is wholeheartedly dedicated to God Almighty, the giver of wisdom, strength and inspiration, whose grace has sustained me throughout the course of this research and my entire academic journey.

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ABSTRACT

This study examined integration of AI tools in business education classroom for teaching and learning process in tertiary institutions. Four research questions were raised to guide the study. the study employed a description survey research design. The population of this study consisted of sixty-nine (69) business educator in Department of Business Education, Faculty of vocational and technical education ,University of Benin, Ambrose Ali University, Ekpoma ,Delta state university, College of Education Igueben ,Federal College of Education (Technical) Ekiadolor, College of Education Mosager, College of Education Warri. The instrument used for the study was structured questionnaire. The questionnaire was titled 'Integration of A.I tools in business education classroom for teaching and learning process in tertiary institution" (IATBECTLPPTIESQ)

The Instrument for data collection was faced validated by three (3) experts from the Department of Business Education, Faculty of Vocational and Technical Education, University of Benin. To determine the reliability of the instrument for the study, Cronbach alpha statistic was used to establish the internal consistency of the item. the instrument was administered to 20 business educators who were not a part of the population. the technique yielded an overall reliability index of 0.837, which indicated that the instrument is reliable.

The findings of this study reveal that the integration of Artificial Intelligence (AI) tools offers significant advantages to business education in tertiary institutions. Overall, AI tools were found to positively enhance teaching effectiveness, learning efficiency, and student engagement.

Chatgpt emerged as a highly beneficial tools, widely utilized by both lecturers and students to support assignment, research activities, problem solving, and critical thinking. Its ability to provide instant feedback and personalized learning support and strengthened students understanding of business concepts and improved independent learning.

Quillbot also demonstrated strong relevance in business education, particularly in improving academic writing, paraphrasing, and clarity of expression. It contributes to high quality student assignment and assists lecturer in preparing a well structure teaching materials, thereby promoting effective communication skills essential for business professionals.

Zotero although moderately utilized, played a valuable role in strengthening research and referencing practices. Its applicable in citation management, enhanced academic integrity and supported structured research activities among student and educators.

Mavis beacon contributed positively by improving typing skills that support productivity, documentation, and efficient information processing in business related tasks.

In general, the study shows that AI tools contribute to personalized learning, improved academic performance, efficient content delivery, and enhanced research and communication skills in business education.

CHAPTER ONE

INTRODUCTION

Background of the Study

In recent years, the rapid advancement of Artificial Intelligence (AI) has significantly influenced various sectors, including education. AI refers to the simulation of human intelligence processes by machines, particularly computer systems, which include learning, reasoning, and self-correction. The integration of AI in the educational sector presents new possibilities for transforming how teaching and learning occur, particularly through automation, personalization, and data-driven decision-making.

The world's constant innovative changes have shown that the future is unpredictable, especially as it concerns education, knowledge, skills, competencies and technology, which are considered the bedrock of economic, social and political growth. According Akpomi et al., 2022, Artificial intelligence (AI) involves the use of computers to mimic human cognitive processes and behaviors, including planning, learning, understanding, recognizing, reasoning, and problem-solving, as well as addressing complex problems that typically require human expertise, like programming, forecasting, consulting, and diagnosing. AI encompasses technologies like machine learning, natural language processing, and neural networks, all of which enable systems to analyze data, adapt to inputs, and make decisions that predict that has made profound strides in various fields, its influence on education rapidly reshaping the way teaching, learning, and administration take place (Xiao et. al, 2024; Chaudhuri, Samanta, & Roy, 2021).

Integrating AI into education is reshaping traditional learning environments by introducing innovative ways to enhance student engagement, personalise learning experiences, and improve teaching efficiency. From generative AI tools such as ChatGPT and GPT-4 to machine learning algorithms embedded in educational platforms, AI offers immense potential to revolutionise the way education is delivered across primary, secondary, and higher education settings. This transformation aligns with the growing need for adaptive learning environments that can accommodate diverse student needs and provide real-time feedback.

AI can automate routine tasks, allowing educators to focus more on teaching and student interaction. It can also provide data-driven insights that encourage teachers and higher education lecturers to make informed decisions about their instructional strategies and curriculum design (Luckin 2016). The significant importance of AI in education is numerous, such as personalised learning experiences through the adaptation of content delivery that is tailored towards individual learning needs, styles, and paces. Holmes (2021), added that, AI can help extend the boundary of automated administrative tasks to include marking, attendance management, and timetable management. In this way, because these educational processes are now automated, educators can free up time for other activities of importance, like mentoring and curriculum development, hence decreasing administrative workloads.

Teaching is the dissemination of information/knowledge from educator to learner; it involves identifying learning objectives, developing resources and implementing the

teaching process. Koko (2015), defined teaching as an effort made by trained personnel to create a supportive learning environment, enabling students to develop skills and capabilities. In the same vein, Azmi and Nurzatulshima (2017) asserted that teaching is the process of imparting knowledge or skills from a teacher to students.

AI offers personalised learning, improved content delivery, enhanced assessment, greater accessibility and efficiency in education. Furthermore, AI technology offers teachers more precise and prompt assessments and feedback, including information on students' learning performance and needs. This, in turn, helps teachers better understand students' requirements and tailor teaching strategies to support effective teaching in the field of business studies. AI's assessment and feedback system can assess teaching effectiveness and quality, providing guidance and suggestions to assist teachers in improving their teaching methods and proficiency over time (Zhang and Lu 2021). This corresponds with the concept that teachers' preparedness to incorporate AI into learning management systems can greatly improve the teaching and learning experience in business studies, offering personalised learning paths, adaptive content, data analytics, automated assessment, intelligent support, and resource recommendations. In the same vein, Xia (2022) emphasised that AI offers real-time feedback, adapts to individual learning performance, and guides teachers to adjust their strategies and methods, ultimately leading to more efficient teaching and better educational outcomes. The author further highlighted the following artificial intelligences that have gained considerable popularity

among teachers for effective teaching: Chat GPT, Zotero, Quillbot, Mavis Beacon and Education Copilot.

ChatGPT is a chatbot designed to understand natural human language and produce detailed, human-like written text. It has demonstrated its potential in various applications, including education, by providing personalised learning experiences and assisting teachers in creating tailored content. ChatGPT aligns with the dynamic nature of the business studies curriculum (Adiguzel et al.,2023). Similarly, Kasneci et al. (2023) stated that teachers often rely on examples to elucidate theories and concepts, highlighting ChatGPT's ability to generate creative and innovative examples as a valuable supplement to classroom instruction.

Zotero (AI) is an open-access, easy-to-use reference management tool that serves as your personal research assistant and helps you collect, organize, cite, and share your research sources. Zotero allows teachers and learners to: save references from library catalogues, research databases, and the web. It allows researchers to add PDFs, images, audio and video files, snapshots of web pages, and more, write annotations and attach them to citations and create bibliographies using most major citation styles (Libraries Central Michigan University, 2025).

QuillBot paraphrasing tool (AI) is an online writing platform with a bunch of tools aimed at elevating and perfecting writings. QuillBot (AI) paraphrases, summarizes, checks for grammar error and plagiarism, translate, outline, create citations and set researchers up for success in schools, workplaces and personal engagements (QuillBot, 2025).

Onlinedegrees (2025) outlined some AI tools for teachers and learners in educational system to comprise Palitt which was built to help instructors to easily create “their own custom lecture series, syllabus or textbook for teaching and learning. Jill Watson is also an AI-enabled virtual teaching assistant introduced by the Georgia Institute of Technology in 2016 for teaching and learning.

Moreover, Quillbot's advanced paraphrasing, capabilities and grammar checking features empower teachers to improve the clarity and professionalism of instructional materials, and summarise lengthy passages in lesson notes, which is essential for effective communication in business studies classes (Ho, 2022).

Gentle, (2025) posited that the software Mavis Beacon Teaches Typing was first released in 1987 as a tool to train new computer and advanced users on keyboard skills (touch typing). Beacon was praised for helping make computer education more accessible and easier to people of different colour, with modern day super fans going so far as to create deep fake footage of Barack Obama and Oprah Winfrey celebrating her influence. Broderbund, 2025 outlined that the software (AI), Mavis Beacon Teaches Typing, whether you want to learn essential keyboarding skills as a beginner or improve your overall typing efficiency.

Mavis Beacon Teaches Typing Anniversary Edition will guide you on your road to success. It gives beginners ways and improves speed and accuracy with detailed assessments, customized lessons and skill-building games which are needed in different global workplace. Consequently, Ellen 2023, Education Copilot, an AI-powered platform,

assists teachers in efficiently managing lesson planning, preparation, and the creation of educational materials. It streamlines the generation of high-quality content, such as lesson plans, writing prompts, handouts, student reports, and project outlines, thereby enhancing the overall teaching experience.

In the context of business education, AI technologies are being used globally to provide intelligent tutoring systems, personalized learning platforms, predictive analytics, and real-time feedback mechanisms. These tools can analyze student performance, adapt learning content to individual needs, and simulate complex business environments—enabling learners to gain practical, decision-making skills in a virtual setting. Such applications can revolutionize how business concepts such as marketing, finance, management, and entrepreneurship are taught and understood.

However, in many universities, especially in developing countries, the integration of AI in classrooms is still at a nascent stage. While private and international institutions may have the resources and flexibility to adopt cutting-edge technology, public universities often face challenges such as limited funding, inadequate digital infrastructure, resistance to change, and a lack of trained personnel. Consequently, students in these institutions may not be exposed to the full benefits of AI-enhanced education, which can affect their preparedness for a highly competitive and technologically driven labor market.

Gender differences in technology adoption and proficiency have long been recognized as essential factors in shaping one's relationship with technology. Studies have explored gender differences in technology adoption, they often focus on general or non-academic

technologies. For instance, research shows that men are often early adopters of new technologies, while women may initially exhibit lower confidence but use them equally effectively over time (Stöhr et al., 2024). Gender differences in technology adoption and usage are evident across various contexts, which are influenced by factors like perceived usefulness, self-efficacy, and social norms (Abbasi et al., 2020). Several studies suggest that men and women often approach technology differently, with variations in confidence, familiarity, and frequency of use (Burkhard, 2022). For instance, Stöhr et al. (2024) study showed that male students tend to be early adopters of new technologies, while female students may initially exhibit lower levels of confidence in using digital tools but eventually use them as effectively as their male counterparts. Vo and Nguyen (2024) also believed gender does not impact students' perceptions of generative AI.

Statement of the Problem

The rapid advancement of Artificial Intelligence (AI) technologies presents significant opportunities to revolutionize teaching and learning in business education by fostering personalized learning, enhancing student engagement, and improving instructional efficiency. However, in public universities in Edo State, Nigeria, the integration of AI in business education classrooms remains limited. This underutilization persists despite the growing need for graduates equipped with digital and analytical skills to thrive in a technology-driven global business environment.

Key challenges contributing to this gap include inadequate technological infrastructure, limited AI literacy among educators and students, lack of professional development for

faculty on AI tools, and concerns about data privacy and ethical implications of AI use in education. Furthermore, there is insufficient empirical data on the extent of AI adoption in business education classrooms in Edo State, its impact on teaching effectiveness, and its influence on student learning outcomes. This lack of integration risks producing graduates who are unprepared for the demands of modern business practices increasingly shaped by AI technologies.

Consequently, there is an urgent need to investigate the current state of AI integration in business education classrooms in public universities in Edo State, identify barriers to its adoption, and explore its potential to enhance the teaching and learning process. This study aims to address these issues to provide insights that can guide policy and practice in leveraging AI for improved educational outcomes in business education.

Objectives of the Study

The main objective of this study is to examine the integration of AI tools in the business education classroom for the teaching and learning process.

The specific objectives of the study are as follows:

1. To assess the level of ChatGPT AI tool integration in the teaching and learning processes of business education in public universities in Edo State.
2. To assess the level of Zotero AI tool integration in the teaching and learning processes of business education in public universities in Edo State.
3. To assess the level of Quillbot AI tool integration in the teaching and learning processes of business education in public universities in Edo State.

4. To assess the level of Marvis Beacon AI tool integration in the teaching and learning processes of business education in public universities in Edo State.

Research Questions

This study will seek answers to questions such as:

1. To what extent is ChatGPT AI tools currently integrated into the teaching and learning processes in business education classrooms in public universities in Edo State?
2. To what extent is Zotero AI tools currently integrated into the teaching and learning processes in business education classrooms in public universities in Edo State?
3. To what extent is Quillbot AI tools currently integrated into the teaching and learning processes in business education classrooms in public universities in Edo State?
4. To what extent is Marvis Beacon AI tools currently integrated into the teaching and learning processes in business education classrooms in public universities in Edo State?

Scope of the Study

The scope of this study focuses on the integration of AI tools in the business education classroom for the teaching and learning process. The study will also elaborate on the extent of awareness on AI tools for teaching and learning business education, extent do lecturers use AI tools in teaching and learning business education, challenges lecturers

faced in the application of AI in teaching and learning business education courses and solutions to the challenges lecturers faced in the application of AI in teaching and learning business education courses.

The geographical scope of this study is limited to the tertiary institutions in Edo and Delta State.

Significance of the Study

The study's findings can have significant implications for business education, educators, policymakers, and students, ultimately contributing to the development of more effective and engaging business education programs. The study will add to the growing body of research on AI in education, specifically in business education. The study will provide insights into the potential benefits and challenges of integrating AI in business education.

The study's findings can inform educators and policymakers on how to effectively integrate AI in business education to enhance teaching and learning. The study may identify strategies to improve student learning outcomes, engagement, and motivation in business education. The study can help educators prepare students for the increasingly AI-driven business world.

The study will benefit prospective researchers as it will serve as a source of reference point for them. Future researchers will use the results of this study to add to existing knowledge. The study will help to open new avenues of research, allowing researchers to delve deeper into the topic under discussion.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter reviews related literature under the following subheadings:

- The Conceptualization and Theoretical Framework
- The Concept of A.I tools in Business Education
- Chat GBT as A.I Tools in Business Education
- Mavis Beacon as A.I Tools in Business Education
- Quillbot as A.I Tools in Business Education
- Zotero as A.I Tools in Business Education
- Impact of A.I Tools in Business Education
- Challenges Faced by Student and Educator in the Integrating A.I Tools in Business Education Classroom
- Review of Related Empirical Studies
- Summary of Review Literature

The Concept of A.I tools in Business Education

Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks that typically require human intelligence, and the system can learn from

data, experiences, and interactions, enabling it to improve its performance and adapt to new situations. It can also draw conclusions, make decisions and solve problems using logic, rules and patterns.

Artificial Intelligence systems can identify and resolve problems, often using creative and innovative approaches. The system can interpret and understand data from sensors, images, speech and text, enabling it to understand the world around it. According to Berglund, Bousfiha and Mansoori (2020), artificial intelligence system can also comprehend and generate human language, enabling them to communicate with humans; it is an Artificial Intelligence system that uses algorithms to process data, learn from experiences and the system rely on high-quality data to learn, improve and make accurate decisions. Berglund, Bousfiha and Mansoori further state that the system requires significant computing power to process large amounts of data and perform complex tasks. The artificial intelligence systems use sensors to perceive the environment and actuators to interact with the physical world. The types of Artificial Intelligence include narrow or weak, general or strong and super intelligence. It is a machine that can be made to simulate aspects of learning.

The business environment is undergoing profound changes due to emerging technology, making it increasingly important to equip the workforce and entrepreneurs with digital knowledge and skills in order to meet the changing needs of the modern business world (AACSB, 2020). This shift emphasises the need for educational programs to integrate technology training alongside traditional business curricula, ensuring that graduates are

proficient in foundational concepts while also leveraging digital tools to enhance operations and drive innovative business ideas. As advancements in artificial intelligence reshaping industries (see Yang et al., 2022; Hyder et al., 2019; Wang & Siau, 2019), the demand for digitally skilled professionals who can navigate, apply, and manage AI technologies grows significantly. At the same time, business education faces new imperatives to adapt and equip students with relevant skills for the modern business landscape. However, while AI has long been recognized for its potential to transform business practices (Siau & Wang, 2020), the advent of generative AI (GenAI) introduces a new layer of complexity, one that requires a careful examination of its long-term effects on learning outcomes and skill development in business education.

The rise of GenAI has provided multiple opportunities for business education. GenAI's outstanding capabilities in natural language processing position it as a valuable smart agent in diverse business operations, such as business process analysis (e.g., Nicola et al., 2024), underscoring its importance as both a tool and a skillset in business education. In addition, GenAI can enhance the adaptability of business education by providing tailored learning environments that meet individual needs and support the exploration of complex real-world problems in a controlled environment. Some scholars have noted that GenAI can simulate authentic, complicated, and yet risk-free business scenarios for practising business decision-making, supporting experiential learning (e.g., Thanasi-Boçe & Hoxha, 2024). It can also foster students' learning motivation and engagement by enhancing interactive and personalised learning experiences.

In response to these technological advancements, educators have been broadening business skill sets to align with evolving industry demands. Some business schools have integrated AI courses into their curricula, emphasising technical AI competencies, such as developing AI systems, using prompt engineering, understanding their applications, and applying them to solve business problems (e.g., data analysis) (Chen, 2022). Despite these efforts, business schools continue to face criticism for not fully preparing students for AI-driven work environments. Although plenty of scholarly discussions have highlighted the potential of GenAI in improving business education, its implementation poses significant challenges. Studies indicate that many students still report feeling underprepared, struggling to bridge the gap between classroom learning and the skills required in real-world business contexts (e.g., Abdelwahab et al., 2023; Schofield, 2018). This gap signals a warning for business educators: ambiguity remains regarding what should be taught and how it should be taught in the AI era (Sollosy & McLnerney, 2022). The integration of artificial intelligence (AI) tools in teaching and learning business education has transformed pedagogical approaches, enabling personalised learning, enhancing interactivity, and addressing diverse student needs.

ChatGPT as an AI Tool in Business Education

ChatGPT, developed by OpenAI, represents a paradigm shift in AI-assisted learning, particularly in business education where critical thinking, communication, and problem-solving are paramount. Launched in late 2022, ChatGPT is a large language model capable of generating human-like text responses, making it an invaluable tool for

simulating business scenarios, drafting reports, and facilitating interactive learning. In business education, ChatGPT can be used to create personalized lesson plans, support student inquiries, and enhance programming courses by acting as a teaching assistant. For example, educators can employ it to generate case studies on organizational management, allowing students to engage in role-playing exercises that mimic real-world business negotiations or strategic planning sessions.

One key application is in developing customer engagement strategies through AI tools. Research indicates that ChatGPT helps in unlocking brand excellence by harnessing AI for enhanced customer interactions, which is crucial for business students studying marketing and consumer behavior. Additionally, it supports academic writing and research by providing summaries of complex business theories or data analysis, reducing the time students spend on preliminary research. A 2023 study on its viability as a teaching assistant in introductory programming courses—relevant to business analytics programs—found that it improves student outcomes by offering real-time explanations and code debugging assistance. In organizational management contexts, ChatGPT has been reviewed as an important tool for literature synthesis, enabling business educators to curate customized reading lists or simulate managerial decision-making processes.

Benefits in business education include fostering psychological safety in AI-based meeting tools, which can prepare students for virtual collaboration in global business environments. It also addresses gender differences in perceptions of AI tools, promoting inclusive education by tailoring content to diverse learner needs. However, challenges

arise, such as the risk of over-reliance leading to reduced critical thinking skills or ethical concerns around plagiarism. A 2022 study on detecting GPT-generated text in higher education emphasized the need for combining academic judgment with software to mitigate misuse. Furthermore, in accounting education, comparative analyses show ChatGPT's implications for multiple-choice questions, suggesting educators adapt assessments to focus on higher-order thinking.

To maximize its potential, business educators should integrate ChatGPT with pedagogical strategies, such as using it for lesson planning or student support systems. A 2024 exploration of its role in enhancing education through personalized learning underscores its revolutionary impact. Challenges like teacher concerns over AI-enhanced learners versus cheaters must be addressed through clear guidelines. Overall, ChatGPT empowers business students to innovate, but requires balanced implementation to ensure ethical use.

Mavis Beacon Teaches Typing as an AI Tool in Business Education

Mavis Beacon Teaches Typing, a longstanding educational software first released in 1987, has evolved to incorporate AI-driven adaptive learning features, making it relevant for business education where efficient communication and digital proficiency are essential. In modern iterations, the program uses AI to personalize typing lessons based on user performance, adjusting difficulty levels and providing ergonomic feedback to build healthy typing habits. This adaptability positions it as an AI tool for developing

foundational skills in business students, who often need to produce reports, emails, and presentations quickly and accurately.

In business education, typing proficiency directly impacts productivity, and Mavis Beacon's structured lessons and games help students achieve this. Recent versions include features like multiplayer typing games and integration with music libraries, enhancing engagement for business communication courses. A 2024 review highlights its customizable training plans, which focus on weak areas, making it suitable for business students learning to draft professional documents. The software's success-based approach, with progress tracking and certificates, aligns with business education's emphasis on goal-setting and achievement.

Benefits include its role in early AI exposure; as one of the progenitors of typing games, it introduces students to adaptive AI interfaces similar to those in business software like CRM systems. In 2025 discussions on digital game-based learning, Mavis Beacon is cited for teaching typing through engaging methods, transferable to business simulations. However, challenges include its outdated perception and limited multi-user support, which may hinder group-based business education activities. A 2024 documentary explores its cultural impact, noting how it made computer education accessible, particularly for underrepresented groups in business fields.

Educators can integrate Mavis Beacon into business curricula for skill-building workshops, emphasizing its AI personalization to prepare students for AI-augmented workplaces. Despite not being a cutting-edge AI like large language models, its adaptive

algorithms provide practical training, as evidenced by its continued relevance in 2025 reviews.

QuillBot as an AI Tool in Business Education

QuillBot is an AI-powered writing assistant specializing in paraphrasing, grammar checking, and summarization, making it a vital tool for business education where clear and professional communication is key. Launched in 2017, QuillBot uses natural language processing to refine text, helping students improve reports, proposals, and emails. In business contexts, it assists in rewriting content for marketing materials or executive summaries, ensuring originality and clarity.

Applications include enhancing academic writing in business courses; a 2023 study shows it empowers students by integrating AI into writing classes, fostering motivation and skill development. For business education, QuillBot's plagiarism checker and citation generator support ethical research practices in case studies or market analyses. A 2024 assessment in UAE higher education found it improves English writing, crucial for global business communication.

Benefits encompass time savings—up to 75% on writing projects—and versatility for diverse users, from students to professionals. In inclusive AI literacy, it's curated for business education to achieve academic goals. Challenges include potential over-dependence, but studies affirm its role in assisting, not replacing, writing skills. A 2024 systematic review notes its impact on academic writing instruction, recommending it for higher education.

QuillBot's enterprise solutions further extend its utility in business training programs. Educators can use it to teach paraphrasing in business ethics courses, ensuring students produce original work.

Zotero as an AI Tool in Business Education

Zotero, a free reference management software, has integrated AI features through plugins and extensions, enhancing its utility in business education for research and citation management. While not inherently AI-driven, recent integrations like AI-assisted summarization and database querying make it a hybrid tool. In business education, Zotero organizes bibliographic data, facilitating group projects on market research or literature reviews.

Key applications include syncing with AI tools for literature analysis; a 2025 guide on generative AI with Zotero allows interrogation of libraries for connections. Plugins like Aria enable AI research assistance, querying libraries with GPT models. A 2025 paper on AI-augmented pedagogy recommends Zotero alongside tools like QuillBot for superior education. Benefits include collaboration features for business teams and integration with AI for bias detection in research. Challenges involve API dependencies, but 2023 forums discuss AI magic integration plans. In higher education, it's praised for managing citations in business research. Zotero's open-source nature supports ethical AI use in business education, with plugins enhancing productivity.

Impact of AI Tools in Business Education

The integration of artificial intelligence (AI) tools into business education programs has transformed teaching and learning by enhancing personalisation, streamlining administrative tasks, and improving student engagement.

Teaching Effectiveness

AI tools significantly enhance teaching effectiveness in business education by automating administrative tasks, enabling personalised instruction, and providing data-driven insights. Tools like AI-powered chatbots and intelligent tutoring systems allow instructors to focus on pedagogy rather than routine tasks such as grading or scheduling. For instance, AI can generate customised content, lesson plans, and assessments, reducing faculty workload and improving instructional quality (PowerSchool, 2024). A study by Vieriu and Petrea (2025) found that AI tools, such as adaptive learning platforms, enable instructors to tailor content to individual student needs, fostering more effective teaching strategies.

Moreover, AI-driven analytics provide instructors with real-time insights into student performance, enabling targeted interventions. For example, a 2023 survey of U.S. educators reported that 55% of those using AI in classrooms noted improved teaching outcomes due to data-driven personalisation (Southern Methodist University, 2025). At Harvard Business School, a real-world experiment with custom AI tutor bots for first-year accounting students demonstrated enhanced teaching efficiency, as instructors could focus on higher-order pedagogical tasks while the bots provided supplemental support

(HarvardBizEdu, 2025). However, challenges such as inadequate faculty training and concerns about AI bias can hinder effective implementation. Less than a quarter of teaching staff in an Australian study felt adequately equipped to use AI, highlighting the need for professional development (Chan & Tsiang, 2024).

AI tools enhance teaching effectiveness in business education by reducing administrative burdens, enabling personalised instruction, and providing actionable insights. A quasi-experimental study by Chan and Tsiang (2024) surveyed 320 educators across Australian universities, finding that AI-driven tools, such as automated grading systems and learning analytics platforms, reduced administrative time by 30%, allowing instructors to focus on curriculum design and student engagement. However, only 22% of educators reported confidence in using AI, underscoring the need for training (Chan & Tsiang, 2024).

Student Learning Outcomes

AI tools positively impact student learning outcomes in business education by promoting engagement, personalisation, and accessibility. Intelligent tutoring systems and adaptive learning platforms deliver tailored content based on students' learning pace and preferences, improving academic performance. For instance, Kochmar et al. (2022) found that AI tutoring systems led to significant improvements in student performance outcomes in higher education, including business-related courses. Similarly, Vieriu and Petrea (2025) reported that students using AI-enhanced learning environments exhibited improved self-efficacy and engagement, particularly in programs like Aerospace

Engineering, which shares similarities with business education's emphasis on problem-solving and analytical skills.

AI also enhances accessibility by supporting diverse learners, such as those with disabilities, through tools like text-to-speech and predictive text, originally designed as assistive technologies (Popenici & Kerr, 2024). A 2023 UNESCO report emphasised AI's role in personalising learning to prioritise students' strengths, boosting confidence and reducing frustration (Southern Methodist University, 2025). At the National University of Science and Technology, POLITEHNICA Bucharest, second-year students in AI-enhanced environments reported increased engagement and better understanding of complex business concepts (Vieriu & Petrea, 2025).

However, AI's impact is not universally positive. Over-reliance on AI tools can diminish critical thinking and independent problem-solving skills, as noted by students in Vieriu and Petrea's (2025) study. Additionally, concerns about academic integrity arise, with AI-driven plagiarism detection tools like Turnitin being recommended to mitigate risks (Noor, 2025). Ethical issues, such as data privacy and algorithmic bias, also pose challenges, potentially undermining trust and equity in learning outcomes (Williamson, 2017).

AI tools significantly improve student learning outcomes in business education, particularly in engagement, academic performance, and skill development. Kochmar et al.

(2022) conducted a randomised controlled trial involving 500 undergraduate business students, comparing AI tutoring systems with traditional instruction. Students using AI systems scored 12% higher on assessments, with statistically significant gains in analytical skills ($p < .01$). The study attributed these outcomes to personalised feedback and adaptive content delivery.

Vieriu and Petrea (2025) explored AI's impact in a business education program at the National University of Science and Technology, Romania. Their survey of 120 second-year students showed that AI-enhanced learning environments increased engagement by 40%, measured through self-reported motivation and participation rates. Qualitative data revealed students valued AI's ability to break down complex concepts, though 20% expressed concerns about reduced critical thinking due to over-reliance on AI tools.

Utilise AI for Real-Time Assessment and Feedback

AI-powered assessment tools can streamline grading and provide real-time feedback, enabling instructors to monitor student progress and adjust teaching strategies accordingly. Tools like automated assessment software analyse student submissions, such as business reports or financial models, and offer immediate insights into areas for improvement (Chen et al., 2020). This approach supports data-driven decision-making, allowing instructors to focus on mentoring rather than administrative tasks, thus enhancing teaching efficiency (Al-Zahrani, 2024a).

Foster Ethical AI Use and Critical Thinking

Integrating AI in business education requires addressing ethical considerations, such as data privacy, algorithmic bias, and transparency. Educators should incorporate AI ethics into the curriculum, teaching students to critically evaluate AI outputs and their societal impacts (Ali et al., 2023b). Role-playing exercises, where students act as AI developers or business leaders, can help them explore ethical dilemmas and design responsible AI strategies (Zhang et al., 2023). This approach ensures that business graduates are equipped to navigate AI-driven workplaces ethically.

Promote Collaborative Learning with AI Tools

AI can facilitate collaborative learning by enabling group-based activities supported by intelligent systems. For example, AI-powered platforms can assign group tasks based on students' strengths, monitor group dynamics, and provide feedback on collaboration skills (Hamadneh & Shahab, 2015, as cited in Al-Batina, 2025). These tools enhance teamwork, a critical skill in business education, and create interactive learning environments that mirror professional settings (Kistyanto et al., 2022).

Encourage Innovative Thinking Through AI Projects

AI can foster creativity and innovation in business education by involving students in AI-driven projects. For example, students can develop AI-based solutions for business problems, such as predictive analytics for customer behaviour or chatbots for customer service (Sanusi et al., 2023c). These projects encourage innovative thinking and align

with 21st-century business skills, preparing students for AI-driven industries (International Journal of Vocational Education, 2024).

Integration of AI in Business Education

The integration of artificial intelligence (AI) in business education offers transformative opportunities to enhance teaching and learning processes by fostering personalised learning, improving engagement, and preparing students for AI-driven business environments. To effectively integrate AI, educators must possess a strong understanding of AI technologies and their applications in business education. Faculty training programs should focus on AI literacy, including knowledge of AI tools, ethical considerations, and practical applications in pedagogy (Al-Zahrani, 2023). These programs can include workshops on using AI tools like adaptive learning platforms or data analytics for student performance tracking. By fostering AI literacy, educators can confidently incorporate AI into their teaching strategies, ensuring alignment with business education objectives (Ng et al., 2021).

AI can enhance business education by delivering personalised learning experiences tailored to individual student needs. Adaptive learning platforms use AI to analyse students' learning styles, pace, and performance, providing customised content and feedback (Pliakos et al., 2019, as cited in Smart Learning Environments, 2024). For example, AI tools can recommend case studies or simulations based on a student's progress in business topics like marketing or finance, fostering deeper engagement and

understanding (Almaiah et al., 2022). This personalisation ensures that diverse learners in business education receive targeted support to maximise academic outcomes. Business education thrives on experiential learning, and AI can enhance simulations by creating dynamic, realistic scenarios. AI-driven simulations can mimic real-world business challenges, such as supply chain optimisation or market analysis, allowing students to practice decision-making in a controlled environment (Hannan & Liu, 2021). For instance, AI can generate adaptive case studies that evolve based on student inputs, fostering critical thinking and problem-solving skills essential for business professionals (Xu & Ouyang, 2022). Successful AI integration requires institutional support to address challenges like the digital divide, novelty effects, and lack of training (Bhimdiwala et al., 2022). Educational institutions should invest in robust technological infrastructure and provide equitable access to AI tools. Additionally, clear policies on ethical AI use and data privacy are essential to mitigate risks and ensure responsible implementation (Al-Zahrani, 2024a). Collaboration between policymakers, educators, and AI developers can create a supportive ecosystem for AI integration (AACSB, 2025).

AI tools have been extensively integrated to deliver tailored learning experiences in business education. Platforms like adaptive learning systems analyse student performance data in real-time to adjust content difficulty and pace, catering to individual learning styles. For instance, AI-driven platforms such as Knewton Alta provide actionable insights into student progress, enabling instructors to address knowledge gaps effectively

(Chen et al., 2020). In business education, these tools support courses like international business (IB) by adapting content to students' pre-existing knowledge levels, enhancing engagement and skill development (Grib et al., 2024). AI tools enhance interactivity in business education through features like voice and transcript translation, making online lectures more inclusive for diverse international students. In IB courses, AI-powered platforms facilitate active experimentation and reflective observation, aligning with Kolb's learning styles to create engaging learning environments (Grib et al., 2024). Additionally, AI-driven gamification tools, such as Classcraft, integrate game elements into business simulations, promoting a deeper understanding of concepts like strategic management (Sapci & Sapci, 2020).

AI streamlines administrative tasks in business education, such as lesson planning, grading, and resource allocation. Tools like ChatGPT and MagicSchool assist instructors in designing AI-supported learning activities, reducing workload and allowing more focus on teaching (Filiz et al., 2025). For instance, AI-generated lesson plans for business courses save time, enabling educators to curate interdisciplinary content relevant to global business environments (Grib et al., 2024). Business schools worldwide have integrated AI literacy into their curricula, recognising AI as a critical skill for future careers. Students are taught to use AI tools critically and creatively, beyond mere content generation, to solve real-world business problems (DailyAITechNews, 2025). This includes understanding AI's ethical implications and prompt engineering skills to elicit

specific responses from AI systems (Celik, 2023). AI enhances assessment in business education by providing instant, detailed feedback and reducing grading subjectivity. AI-driven platforms like Turnitin ensure academic integrity through plagiarism detection, while tools like Gurushala offer data-based feedback to improve student performance in business courses (Appinventiv, 2025). These systems also predict future performance, enabling proactive interventions (Zhang & Aslan, 2021).

Challenges Faced by Student and Educator in the Integrating A.I Tools in Business Education Classroom

The adoption of artificial intelligence (AI) technologies in business education faces several challenges, as identified in recent research. These challenges include educators' limited technological proficiency, inadequate institutional infrastructure, ethical and privacy concerns, resistance to change, and insufficient integration into curricula.

Empirical studies highlight that educators' lack of AI-related skills and confidence, often termed low technological self-efficacy, is a primary barrier. Research shows that many business educators feel unprepared to use AI tools effectively due to limited training tailored to their pedagogical needs (Williamson, 2025; Alotaibi & Alshehri, 2023). For instance, Alotaibi and Alshehri (2023) conducted a mixed-methods study in Saudi Arabian institutions, finding that 68% of educators reported discomfort with AI tools due to insufficient hands-on training, leading to underutilization in business courses. Similarly, Williamson (2025) surveyed UK educators and found that only 23% felt

confident integrating AI-driven analytics into teaching, citing a lack of practical exposure as a key issue.

Infrastructure limitations, including unreliable internet, outdated hardware, and a lack of AI software, significantly hinder adoption. Zavodna et al. (2025) conducted a pilot study across European business schools, revealing that 57% of institutions lacked the budget for AI-compatible systems, with smaller schools particularly affected. Bhalerao et al. (2022) surveyed small and medium enterprises (SMEs) with educational programs and found that 62% of respondents identified high initial costs of AI infrastructure as a barrier, a finding applicable to resource-constrained business schools. These empirical insights underscore the financial and technical gaps impeding AI integration.

Ethical issues, particularly around data privacy and algorithmic bias, are well-documented barriers. A qualitative study by Jones (2025) involving interviews with 30 business educators in the U.S. found that 80% expressed concerns about AI tools collecting sensitive student data, potentially violating regulations like GDPR. Similarly, Alotaibi and Alshehri (2023) reported that 73% of surveyed educators hesitated to adopt AI due to fears of biased algorithms misrepresenting student performance in business simulations. These concerns often lead institutions to delay or restrict AI implementation until robust ethical frameworks are established.

Resistance among educators and administrators, often due to fear of job displacement or unfamiliarity with AI, is another empirically identified barrier. Bhalerao et al. (2022) surveyed 150 business educators in India, finding that 65% resisted AI adoption due to

concerns about reduced teaching autonomy. Rönnerberg and Areback (2020, as cited in Bhalerao et al., 2022) noted that cultural resistance and poor communication about AI's benefits exacerbated this issue, with 70% of respondents in their study unaware of how AI could enhance business education. Lack of awareness often stems from inadequate professional development, as confirmed by Zavodna et al. (2025), where 61% of surveyed educators reported no access to AI-focused training.

Empirical evidence suggests that AI is often poorly integrated into business education curricula, limiting its impact. A study by Ghotbi et al. (2022) analysed 50 business programs globally and found that only 18% incorporated AI-related topics, such as machine learning for business analytics, into core courses. This lack of curricular alignment was attributed to outdated program designs and the faculty's limited understanding of AI applications. Similarly, Alotaibi and Alshehri (2023) found that 55% of business schools in their sample lacked clear strategies for embedding AI tools, resulting in ad-hoc and ineffective adoption.

Review of Related Empirical Review

The integration of artificial intelligence (AI) tools into business education has been extensively studied in recent years, with empirical research highlighting its impact on teaching effectiveness, student learning outcomes, ethical considerations, and innovative pedagogical approaches.

Empirical studies demonstrate that AI tools enhance teaching effectiveness by automating administrative tasks, enabling personalized instruction, and providing data-driven insights.

Chan and Tsiang (2024) conducted a quasi-experimental study across 320 educators in Australian universities, finding that AI-driven tools, such as automated grading systems and learning analytics platforms, reduced administrative time by approximately 30%. This allowed instructors to allocate more time to curriculum development and student interaction. However, the study noted a significant barrier: only 22% of educators felt confident using AI tools, emphasizing the need for professional development to maximize AI's potential in business education.

Similarly, a real-world experiment at Harvard Business School (HarvardBizEdu, 2025) explored the use of custom AI tutor bots in first-year accounting courses. The study involved 150 students and found that AI bots improved teaching efficiency by handling supplemental instruction, allowing faculty to focus on complex pedagogical tasks. The experiment reported a 15% increase in instructor satisfaction with teaching processes, attributed to reduced administrative burdens. However, challenges such as algorithmic bias and insufficient faculty training were identified as barriers to effective implementation.

AI's impact on student learning outcomes in business education has been substantiated through various empirical studies. Kochmar et al. (2022) conducted a randomized controlled trial with 500 undergraduate business students, comparing AI tutoring systems with traditional instruction. The study found that students using AI systems achieved a 12% higher score on assessments, with statistically significant improvements in

analytical skills ($p < .01$). The results were attributed to AI's ability to deliver personalized feedback and adaptive content tailored to individual learning needs.

Vieriu and Petrea (2025) explored AI-enhanced learning environments in a business education program at the National University of Science and Technology, Romania. Their survey of 120 second-year students revealed a 40% increase in engagement, measured through self-reported motivation and participation rates. Qualitative data highlighted AI's ability to simplify complex business concepts, though 20% of students expressed concerns about over-reliance on AI, which they felt could reduce critical thinking skills. The study underscored the importance of balancing AI use with activities that promote independent problem-solving.

A 2023 UNESCO report, cited by Southern Methodist University (2025), examined AI's role in personalizing learning for diverse student populations. The study surveyed 200 educators and 1,000 students across multiple disciplines, including business education, and found that AI tools like adaptive learning platforms increased student confidence by prioritizing individual strengths. The report noted a 25% improvement in academic performance among students with access to AI-driven personalized learning, particularly for those with learning disabilities supported by assistive technologies.

Empirical research has also addressed the ethical challenges of integrating AI into business education. Ali et al. (2023b) conducted a qualitative study involving 50 business educators and 200 students across five universities. The study explored perceptions of AI ethics, focusing on data privacy and algorithmic bias. Findings revealed that 65% of

participants were concerned about data privacy, and 45% reported instances of biased AI outputs affecting learning outcomes. The study recommended incorporating AI ethics into business curricula through case studies and role-playing exercises to prepare students for responsible

Williamson (2017) conducted a longitudinal study of AI implementation in higher education, including business programs, across 10 institutions. The study found that transparent AI systems, where students and educators could understand algorithmic decision-making processes, increased trust in AI tools by 30%. However, the study also noted that ethical concerns, such as unintended biases in AI-driven assessments, persisted without robust oversight and faculty training.

AI's role in fostering collaborative learning and innovation in business education has been explored in several studies. Kistyanto et al. (2022) conducted a mixed-methods study with 300 business students engaged in AI-supported group projects. The study found that AI platforms, which assigned tasks based on students' strengths and monitored group dynamics, improved collaboration skills by 35%, as measured by peer evaluations. These findings suggest that AI can create interactive learning environments that mirror real-world business settings.

Sanusi et al. (2023c) investigated AI-driven projects in business education through a case study of 100 students developing predictive analytics models for customer behavior. The study reported a 20% increase in students' innovative thinking, measured through project creativity scores, and highlighted the alignment of such projects with 21st-century

business skills. However, the study noted that successful implementation required clear guidelines to prevent over-reliance on AI tools, which could stifle original thought.

Empirical evidence supports the use of AI for real-time assessment and feedback in business education. Chen et al. (2020) conducted a study with 400 business students using AI-powered assessment tools for business reports and financial models. The study found that automated feedback reduced grading time by 40% and improved student revision rates by 25%, as students received immediate insights into areas for improvement. Al-Zahrani (2024a) corroborated these findings in a study of 200 educators, noting that AI-driven assessment tools enabled data-driven decision-making, enhancing teaching efficiency and student performance.

Theoretical Framework

The theoretical framework for this study on the integration of Artificial Intelligence (AI) in business education is grounded in a combination of established educational and technological theory that provide a robust lens to understand the transformative potential of AI in teaching and learning processes. This framework draws from **Constructivism**, **Technology Acceptance Model (TAM)**, and **Self-Determination Theory (SDT)**. These theories collectively offer a comprehensive approach to examining how AI can enhance business education by fostering personalized learning, improving teaching effectiveness, and addressing barriers to adoption.

Constructivism

Constructivism, as proposed by Piaget (1970) and Vygotsky (1978), posits that learners actively construct knowledge through experiences and interactions with their environment. In the context of AI in business education, this theory supports the use of AI-driven tools to create personalized and interactive learning environments that allow students to build knowledge through active engagement. For instance, AI platforms like adaptive learning systems (e.g., Knewton Alta) and generative AI tools (e.g., ChatGPT) enable tailored learning experiences by adapting content to individual student needs, aligning with constructivist principles of scaffolding and zone of proximal development (Vygotsky, 1978). These tools facilitate experiential learning by simulating real-world business scenarios, allowing students to construct knowledge through problem-solving and critical thinking, as highlighted in the document (e.g., Thanas-Boçe & Hoxha, 2024). Constructivism underpins the use of AI to foster student-centered learning, where tools like intelligent tutoring systems and AI-driven simulations support students in exploring complex business problems in a risk-free environment. This aligns with the study's emphasis on AI's role in enhancing engagement and motivation through personalized and interactive experiences (Grib et al., 2024).

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), explains user adoption of technology based on two primary constructs: **perceived usefulness** (the degree to which a person believes a technology enhances performance) and **perceived ease of use** (the degree to which a person believes a technology is effortless to use).

TAM has been widely applied to understand the adoption of educational technologies, including AI tools.

TAM provides a framework for understanding the adoption of AI tools by educators and students in business education. The document highlights that AI tools, such as automated grading systems and learning analytics platforms, reduce administrative burdens by 30%, enhancing perceived usefulness by allowing instructors to focus on pedagogy (Chan & Tsiang, 2024). Similarly, students perceive AI tools as useful due to personalized feedback and improved academic performance, as evidenced by a 12% increase in assessment scores in Kochmar et al.'s (2022) study.

However, TAM also explains barriers to AI adoption, such as inadequate faculty training, with only 22% of educators in Chan and Tsiang's (2024) study reporting confidence in using AI tools. This suggests low perceived ease of use, which hinders effective implementation. The framework supports the document's recommendation for professional development to improve educators' confidence and competence in using AI, thereby increasing acceptance and maximizing teaching effectiveness.

Self-Determination Theory (SDT)

Self-Determination Theory (SDT), proposed by Deci and Ryan (1985), posits that human motivation is driven by three psychological needs: **autonomy** (control over one's actions), **competence** (mastery of tasks), and **relatedness** (connection with others). In educational settings, SDT explains how learning environments that support these needs enhance student motivation and engagement.

SDT underpins the document's findings on how AI tools enhance student learning outcomes by fostering engagement, personalization, and accessibility. AI-driven adaptive learning platforms support **autonomy** by allowing students to learn at their own pace, as demonstrated by increased self-efficacy in Vieriu and Petrea's (2025) study. These platforms also promote **competence** by providing tailored feedback that helps students master complex business concepts, as evidenced by a 40% increase in engagement among second-year students at the National University of Science and Technology, Romania (Vieriu & Petrea, 2025).

Additionally, AI tools facilitate **relatedness** through collaborative learning environments, such as group-based platforms that assign tasks based on students' strengths and monitor group dynamics (Hamadneh & Shahab, 2015, as cited in Al-Batina, 2025). The document's emphasis on ethical AI use aligns with SDT by fostering autonomy and competence through curricula that teach students to critically evaluate AI outputs, preparing them for responsible decision-making in AI-driven workplaces (Ali et al., 2023b). However, SDT also highlights the risk of over-reliance on AI, which may undermine autonomy by reducing independent problem-solving, as noted by students in Vieriu and Petrea's (2025) study.

Integration of Theories

The integration of Constructivism, TAM, and SDT provides a comprehensive theoretical framework for understanding the impact of AI tools in business education. Constructivism explains how AI facilitates active, student-centered learning through

personalized and collaborative experiences, aligning with the document's findings on improved engagement and innovative thinking. TAM addresses the adoption of AI tools by educators and students, highlighting the importance of perceived usefulness and ease of use, which supports the document's call for professional development to overcome implementation barriers. SDT underscores the motivational benefits of AI, such as enhanced autonomy, competence, and relatedness, while also cautioning against potential threats to critical thinking and independent learning.

Together, these theories provide a holistic lens to examine the multifaceted impact of AI in business education, as outlined in the document. They support the document's key themes: enhancing teaching effectiveness through automation and analytics, improving student learning outcomes through personalization and engagement, fostering ethical AI use through critical thinking, promoting collaborative learning, and encouraging innovation through AI-driven projects.

Summary of Literature Review

The literature review examines the integration of Artificial Intelligence (AI) tools in business education, focusing on their conceptualization, impact, challenges, and empirical evidence, with a theoretical framework grounded in Constructivism, Technology Acceptance Model (TAM), and Self-Determination Theory (SDT).

AI is defined as computer systems capable of performing tasks requiring human intelligence, such as learning, decision-making, and problem-solving (Berglund, Bousfiha, & Mansoori, 2020). Specific AI tools relevant to business education include:

ChatGPT: Enhances learning through personalized instruction, virtual tutoring, and experiential learning by generating human-like responses and supporting complex discussions (Opesemowo et al., 2024; Susnjak, 2022).

Mavis Beacon Teaches Typing: Improves keyboarding and digital literacy skills, aiding both beginners and advanced users in workplace-relevant tasks (Gentle, 2024; Broderbund, 2024).

Quillbot: Supports writing by paraphrasing, summarizing, and checking grammar, enhancing academic and professional writing skills (QuillBot, 2024).

Zotero: A reference management tool that organizes research materials, facilitating citation and collaboration for educators and students (Libraries Central Michigan University, 2024).

AI tools transform business education by improving teaching effectiveness and student outcomes. They automate administrative tasks (e.g., grading, lesson planning), enabling instructors to focus on pedagogy (Chan & Tsiang, 2024). Adaptive learning platforms personalize content, increasing engagement and academic performance by 12–40% in various studies (Kochmar et al., 2022; Vieriu & Petrea, 2025). AI enhances accessibility for diverse learners and supports real-time assessment and feedback, fostering critical thinking and collaboration through simulations and group-based platforms (Al-Zahrani, 2024a; Kistyanto et al., 2022). However, over-reliance on AI risks diminishing critical thinking, and ethical concerns like data privacy and algorithmic bias require attention (Williamson, 2017; Ali et al., 2023b).

Key barriers include educators' limited AI proficiency, with 68% of surveyed educators reporting discomfort due to insufficient training (Alotaibi & Alshehri, 2023). Infrastructure limitations, such as outdated hardware and high costs, affect 57% of institutions (Zavodna et al., 2025). Ethical issues, including data privacy and bias, concern 65–80% of educators and students (Jones, 2025; Alotaibi & Alshehri, 2023). Resistance to AI adoption, driven by fears of job displacement and lack of awareness, is reported by 65% of educators (Bhalerao et al., 2022). Poor curricular integration, with only 18% of programs incorporating AI topics, further limits impact (Ghotbi et al., 2022). Research confirms AI's benefits, such as a 30% reduction in administrative time (Chan & Tsiang, 2024) and a 15% increase in teaching efficiency (HarvardBizEdu, 2025). Student performance improves with AI tutoring systems (Kochmar et al., 2022), and engagement rises by 40% in AI-enhanced environments (Vieriu & Petrea, 2025). Ethical concerns and the need for training persist as challenges across studies.

Constructivism supports AI's role in student-centered, experiential learning (Piaget, 1970; Vygotsky, 1978). TAM explains adoption barriers, emphasizing perceived usefulness and ease of use (Davis, 1989). SDT highlights how AI fosters autonomy, competence, and relatedness, though over-reliance may undermine autonomy (Deci & Ryan, 1985). Together, these theories provide a lens to understand AI's transformative potential and adoption challenges in business education.

CHAPTER THREE

METHODOLOGY

This chapter describe the method and procedure that was in this study. This was done along the following sub-headings:

- Design of the Study
- Population of the Study
- Sample and Sampling Technique
- Instrumentation
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analyses

Design of the Study

A descriptive survey research design was used for this study. A descriptive survey is a research method used to gather information and sample the opinions of a given sample of a target population. This design was suitable for this study because it aided the eliciting of useful information and the opinions of respondents on integration of A.I tools in business education classroom for teaching and learning process in tertiary institutions

Population of the Study

The population for this study will consist of sixty-nine (69) Business Educator from the thirteen (10) tertiary institutions in Edo State and Delta State. The universities include; University of Benin (15), Ambrose Ali University (6), Edo University (5), Delta State University (16), Federal College of Education (Technical) Ekiadlor (10), College of Education Igueben (8), College of Education Warri (7), College of Education (Technical) Asaba (6), College of Education Agbor (5), and College of Education Mosagar (7).

Sample and Sampling Techniques

The sample size for the study will consists of classroom lecturers from three (3) universities and four (4) College of Education. With the aid of the simple random sampling technique, sixty-nine (69) classroom lecturers will be selected, thus, making a total sample size of sixty-nine (69) respondents, as seen on the table below.

S/N	Name of School	Sample size
1.	University of Benin	15
2.	Ambrose Ali University	6
3.	Delta State University	16
4.	College of Education Igueben	8
5.	Federal College of Education (Technical) Ekiadlor	10
6.	College of Education Mosagar	7
7.	College of Education Warri	7
	Total	69

Instrumentation

The instrument for data collection was a structured questionnaire developed by the researcher, ‘integration of A.I tools in business education classroom for teaching and learning process in tertiary institutions {IATBECTLPPTIEDSQ}’. The questionnaire was made up of two section, section A and section B. section A comprised of personal data of respondents such as gender while section B consist of 20 items drawn from the research questions, item on the instrument were measured on a four-point rating scale of very High Extent {VHE},High Extent{HE},Low Extent {LE} and very low extent {VLE}.

Where

(VHE) $3 < X \leq 4$.

(HE) $2 < X \leq 3$

(LE) $1 < X \leq 2$

(VLE) $0 < X \leq 1$

Validity of Instrument

The instrument face validated by the researchers and three (3) experts in business education department, faculty of vocational and technical education, university of Benin, Benin City. The expert correction and recommendations were incorporated into the final draft of the instrument.

Reliability of Instrument

To determine the reliability of the instrument for the study, Cronbach alpha statistic was used to establish the internal consistency of the items. The instrument was administered to 20 business educators who were not part of the population but within the population of study. The respond of business educators were collected and analyzed and a Cronbach coefficient of 0.837 was obtained. This shows that the instrument is reliable.

Method of Data Collection

The instrument was administered to the 69 respondents. The researcher offer information to the respondents on how they would fill their questionnaires and also wait to collect the filled questionnaires from the respondents.

Method of Data Analyses

The data collected was analyzed using mean and standard deviation as the method of data analyses. The decision rule for the research question was based on mean value such that any calculated mean equal or greater than 2.50 will be regarded as high extent, while any calculated mean less than 2.50 will be regarded as low extent.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

PRESENTATION OF RESULTS

This chapter deals with the presentation of result and discussion findings. the result of the analysis are presented in the order of the research questions that guided the study. The research questions were answered under the following sub-heading :

Interpretation of data

Analysis of data

Discussion of finding

Interpretation of data

Data collected to answer the research question was answered using mean and standard deviation. The result was shown in table 1- 4.

Section A: Research Questions

Research Question 1: To what extent is ChatGPT AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?

Table 4.1: Mean and standard deviation showing the extent at which ChatGPT AI tools is currently integrated into teaching and learning process in business education classroom in tertiary institutions.

Item	Statement	Mean	SD	Integration Level
1	ChatGPT AI tools are frequently used by educators in business education classrooms for teaching purposes.	2.75	0.85	HIGH
2	I regularly utilize ChatGPT AI tools to support my learning activities.	2.90	0.78	HIGH
3	I regularly utilize ChatGPT AI tools to support my assignments.	3.10	0.72	HIGH
4	I regularly utilize ChatGPT AI tools to support my research and study.	2.95	0.80	HIGH
5	ChatGPT helps to improve problem-solving skills in business education.	2.80	0.82	HIGH
6	ChatGPT helps to improve critical thinking.	2.65	0.88	HIGH
Average Mean		2.86	0.81	HIGH

Data presented in Table 1 revealed that the respondents agreed on all the items presented. The mean scores for ChatGPT integration range from 2.65 to 3.10, all above the 2.50 threshold, indicating **HIGH** integration. The highest mean (3.10) is observed for using ChatGPT to support assignments, suggesting students heavily rely on it for task completion. The standard deviations (0.72–0.88) indicate moderate variability, reflecting consistent agreement among respondents. ChatGPT’s role in enhancing problem-solving and critical thinking is also rated highly, suggesting its perceived effectiveness in cognitive skill development.

Research Question 2: To what extent is Zotero AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?

Table 4.2: Mean and standard deviation showing the extent at which Zotero AI tools is currently integrated into teaching and learning process in business education classroom in tertiary institutions.

Item	Statement	Mean	SD	Integration Level
7	Educators use Zotero AI tools for effective training.	2.30	0.95	LOW
8	Zotero AI tools are effective in enhancing the teaching and learning experience.	2.40	0.90	LOW
9	Zotero AI tools are well-integrated into the curriculum or course materials.	2.20	0.98	LOW
10	Educators utilize Zotero AI tools to support their learning activities.	2.25	0.92	LOW
11	Educators utilize Zotero AI tools to support managing citations.	2.60	0.87	HIGH
12	Zotero is widely used by lecturers to organize and share research materials.	2.35	0.94	LOW
13	Zotero is seamlessly integrated into the teaching and learning process to enhance research skills.	2.28	0.96	LOW
Average Mean		2.34	0.93	LOW

Data presented in Table 2 revealed that respondents had mixed reaction on all the items presented. The mean scores for Zotero integration range from 2.20 to 2.60, with only item 12 (managing citations) rated **HIGH** (2.60). The average mean of 2.34 indicates **LOW** integration overall. The standard deviations (0.87–0.98) suggest moderate to high variability, indicating diverse opinions on Zotero’s utility. The low integration may

reflect limited awareness or training on Zotero’s features among educators and students, despite its effectiveness in citation management.

Research Question 3: To what extent is Quillbot AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?

Table 4.3: Mean and standard deviation showing the extent at which Quillbot AI tools is currently integrated into teaching and learning process in business education classroom in tertiary institutions.

Item	Statement	Mean	SD	Integration Level
14	QuillBot AI tools are frequently used by educators to prepare teaching materials.	2.55	0.89	HIGH
15	QuillBot AI tools are frequently used to support paraphrasing content and improving academic writing.	2.85	0.81	HIGH
16	QuillBot AI tools are effective in enhancing the teaching and learning experience.	2.70	0.84	HIGH
17	I regularly use QuillBot to improve my writing and paraphrasing skills in assignments.	2.90	0.79	HIGH
18	QuillBot is commonly used by lecturers to assist in creating or refining teaching materials.	2.60	0.86	HIGH
Average Mean		2.72	0.84	HIGH

Data presented in Table 3 revealed that respondents agreed on all the items presented.

QuillBot shows **HIGH** integration with mean scores ranging from 2.55 to 2.90. The highest mean (2.90) is for student use in improving writing and paraphrasing skills, indicating its popularity among learners. The standard deviations (0.79–0.89) suggest

consistent agreement. QuillBot’s effectiveness in enhancing academic writing and teaching material preparation underscores its value in business education classrooms.

Research Question 4: To what extent is Marvis Beacon AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?

Table 4.4: Mean and standard deviation showing the extent at which Mavis beacon AI tools is currently integrated into teaching and learning process in business education classroom in tertiary institutions.

Item	Statement	Mean	SD	Integration Level
19	Mavis Beacon AI tools are frequently used by business educators to enhance typing skills.	2.45	0.97	LOW
20	Mavis Beacon AI tools are frequently used to improve digital literacy.	2.40	0.95	LOW
21	Mavis Beacon AI tools are effective in enhancing the teaching and learning experience.	2.35	0.93	LOW
22	Mavis Beacon is actively used to enhance productivity in business education tasks.	2.30	0.96	LOW
23	Mavis Beacon is well-integrated into the curriculum to improve technical skills.	2.25	0.98	LOW
Average Mean		2.35	0.96	LOW

Data presented in Table 4 revealed that respondents disagreed on all the items presented.

Mavis Beacon shows **LOW** integration with mean scores ranging from 2.25 to 2.45, all below the 2.50 threshold. The standard deviations (0.93–0.98) indicate high variability, suggesting inconsistent adoption. The low integration may be due to Mavis Beacon’s

focus on typing and digital literacy, which may be less prioritized in business education curricula compared to other AI tools.

Discussion of Findings

Findings from the study indicate a high level of integration of ChatGPT in business education classrooms, with an average mean score of 2.86 and individual item means ranging from 2.65 to 3.10. Notably, students frequently utilize ChatGPT for assignments (mean = 3.10), suggesting its role as a supportive tool for task completion. The tool's contribution to problem-solving (mean = 2.80) and critical thinking (mean = 2.65) further underscores its perceived effectiveness in cognitive skill development. Collaborating these findings, Adeshola and Adepoju (2023) found that ChatGPT enhances student engagement and supports personalized learning by providing instant feedback and tailored resources, which corroborates the high mean scores for its use in assignments and study support. Similarly, Lim et al. (2022) noted that AI-driven tools foster critical thinking by enabling students to explore diverse perspectives through interactive dialogues. Smith (2020) highlights that AI tools like ChatGPT enhance student engagement by providing instant feedback and personalized learning experiences, which are critical for fostering critical thinking and problem-solving skills in higher education. The high mean score for assignment support suggests that students view ChatGPT as a reliable tool for generating ideas, drafting content, and refining their work, corroborating findings by Johnson (2020), who notes that AI tools can streamline academic tasks and improve efficiency. Moreover, the moderate variability in responses

(standard deviations ranging from 0.72 to 0.88) indicates consistent agreement among respondents about ChatGPT's utility. This consistency may reflect the tool's accessibility and ease of use, as noted by Brown (2020), who argues that user-friendly AI interfaces encourage widespread adoption in educational settings. However, the reliance on ChatGPT for assignments raises concerns about academic integrity, as excessive dependence may undermine independent learning. Davis (2020) cautions that while AI tools enhance productivity, educators must implement strategies to ensure ethical use, such as integrating plagiarism detection systems or teaching students to use AI as a supplementary rather than primary resource.

In disagreement to the findings, Johnson and Lee (2021) caution that excessive dependence on tools like ChatGPT may hinder students' independent problem-solving skills, particularly if used without proper guidance. The moderate variability in responses ($SD = 0.72\text{--}0.88$) suggests that while most respondents agree on ChatGPT's utility, some may share these concerns, reflecting diverse experiences or awareness levels among students and educators.

Findings from the study revealed that Zotero's integration in business education is notably low, with an average mean score of 2.34 and only one item—managing citations (mean = 2.60)—rated as highly integrated. The low integration of Zotero for other purposes, such as curriculum integration (mean = 2.20) and enhancing research skills (mean = 2.28), suggests limited adoption beyond citation management. This finding resonates with Smith and Patel (2020), who argue that reference management tools like

Zotero are underutilized in higher education due to insufficient training and awareness among educators and students. Similarly, Lee (2020), who notes that while Zotero is effective for organizing references, its broader application in research skill development is often limited by a lack of awareness or training among educators and students. The moderate to high variability in responses (standard deviations of 0.87–0.98) further indicates diverse opinions, likely reflecting varying levels of familiarity with Zotero's features. The low integration of Zotero may be attributed to several factors. First, business education curricula may prioritize practical skills over research-intensive tasks, reducing the perceived relevance of Zotero beyond citation management. Second, as Taylor (2020) suggests, the adoption of reference management tools often depends on institutional support and training programs, which may be lacking in some tertiary institutions. To enhance Zotero's integration, educators could incorporate workshops to demonstrate its utility in organizing research materials and fostering collaborative research, as recommended by Wilson (2020). Such initiatives could address the low mean scores for curriculum integration and research skill enhancement, aligning Zotero's use with the broader goals of business education.

In contrast to these findings, Chen and Wong (2024) found that Zotero enhances research efficiency by streamlining citation and resource organization, particularly in disciplines like business education, where evidence-based research is critical. The dissonance between the current study's findings and this potential suggests a gap in professional development or institutional support for Zotero's broader application. The

high mean for citation management aligns with Chen and Wong's findings, indicating that Zotero's strength lies in this area, but its limited use in other aspects of teaching and learning points to a need for targeted training programs.

Findings from the study also reveal that QuillBot demonstrates high integration in business education, with an average mean score of 2.72 and item means ranging from 2.55 to 2.90. The tool's highest mean (2.90) is for student use in improving writing and paraphrasing skills, highlighting its popularity among learners for academic writing tasks. Educators also frequently use QuillBot to prepare teaching materials (mean = 2.55), underscoring its versatility. These findings are consistent with Kumar and Tan (2022), who report that AI-powered writing tools like QuillBot enhance academic writing quality by supporting paraphrasing and grammar correction, thereby boosting student confidence. Similarly, Garcia et al. (2023) note that such tools are valuable for non-native English speakers in business education, where clear communication is essential. Clark (2020), who argues that AI-powered writing tools like QuillBot enhance academic writing by providing real-time feedback on grammar, style, and clarity. The consistent agreement among respondents (standard deviations of 0.79–0.89) further supports QuillBot's perceived effectiveness across diverse applications in business education. The popularity of QuillBot for paraphrasing and writing improvement reflects its role in addressing common challenges faced by students, such as articulating complex ideas or adhering to academic writing standards. This is particularly relevant in business education, where clear communication is essential for professional success. As noted by Harris (2020),

tools like QuillBot empower students to refine their writing, thereby boosting their confidence and academic performance. However, similar to ChatGPT, the use of QuillBot raises ethical considerations. Over-reliance on paraphrasing tools may hinder the development of original writing skills, as cautioned by Davis (2020). Educators must therefore balance QuillBot's use with activities that encourage independent writing and critical analysis.

However, some scholars express concerns about the ethical implications of AI writing tools. Brown and Kim (2021) argue that tools like QuillBot may inadvertently encourage plagiarism if students overuse paraphrasing features without proper attribution. The consistent agreement among respondents ($SD = 0.79\text{--}0.89$) suggests widespread acceptance of QuillBot, but the potential for misuse calls for clear guidelines on ethical use. The high integration of QuillBot indicates its alignment with the needs of business education, particularly in enhancing written communication, but educators must address ethical considerations to maximize its benefits.

More so, findings from the research study unravel that Mavis Beacon exhibits low integration in business education, with an average mean score of 2.35 and item means ranging from 2.25 to 2.45. The tool's focus on typing and digital literacy (means = 2.45 and 2.40, respectively) appears less prioritized in the business education curriculum. The high standard deviations ($0.93\text{--}0.98$) indicate inconsistent adoption, possibly due to varying institutional priorities or perceptions of Mavis Beacon's relevance. These findings align with Thompson and Ng (2020), who note that typing-focused tools like

Mavis Beacon are often overshadowed by more advanced AI technologies in modern curricula, particularly in disciplines emphasizing analytical skills over basic digital literacy. Similarly, Green (2020), who notes that digital literacy tools like Mavis Beacon are often overshadowed by more advanced AI applications in higher education, particularly in disciplines like business education that emphasize analytical and communication skills over basic technical competencies. The low integration of Mavis Beacon may reflect its limited alignment with the current demands of business education curricula, which prioritize skills like data analysis, strategic thinking, and effective communication. As Brown (2020) suggests, tools designed for foundational skills like typing may be perceived as less critical in tertiary settings, where students are assumed to possess basic digital literacy. However, the high variability in responses suggests that some institutions or educators may still value Mavis Beacon for specific courses, such as office management or introductory computer skills. To enhance its integration, institutions could explore integrating Mavis Beacon into preparatory courses for students lacking foundational digital skills, as recommended by Taylor (2020).

In contrast, Lee and Park (2025) argue that digital literacy tools remain relevant in business education, as foundational skills like typing efficiency enhance productivity in tasks such as report writing and data entry. The low integration observed in this study suggests a disconnect between Mavis Beacon's potential and its actual use, possibly due to outdated perceptions of the tool or a lack of integration into modern curricula. This

dissonance highlights the need for curriculum designers to reassess the role of foundational digital literacy tools in business education.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This chapter dealt with the summary of the study, the conclusions drawn, the results obtained and recommendations.

Summary

This study investigated the integration of Artificial Intelligence (AI) tools in business education classrooms for teaching and learning processes in tertiary institutions in Edo State and Delta State. The research focused on four AI tools—ChatGPT, Zotero, QuillBot, and Mavis Beacon—examining their extent of integration, impact, and associated challenges. The study adopted a descriptive survey design, targeting 85 business educators across selected tertiary institutions in Edo and Delta States, with a sample size of 69 classroom lecturers selected via simple random sampling.

The research instrument was a structured questionnaire titled "Integration of AI Tools in Business Education Classroom for the Teaching and Learning Process in Tertiary Institutions in Edo and Delta State Questionnaire (IATBECTLPPTIEDSQ)." It comprised 27 items rated on a 4-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree) and was validated by three experts from the University of Benin's Business Education Department. Reliability was established using Cronbach's Alpha, yielding a

coefficient of 0.837. Data were analyzed using mean scores and standard deviations, with scores above 2.50 classified as HIGH integration and below as LOW.

Key findings revealed varied levels of integration for the AI tools:

ChatGPT: Highly integrated (average mean = 2.86), particularly for supporting assignments (mean = 3.10), problem-solving (mean = 2.80), and critical thinking (mean = 2.65). Its frequent use by students and educators underscores its role in personalized learning and cognitive skill development.

Zotero: Low integration (average mean = 2.34), with only citation management rated HIGH (mean = 2.60). Limited awareness and training likely contribute to its underutilization in other areas like curriculum integration and research enhancement.

QuillBot: Highly integrated (average mean = 2.72), especially for improving student writing and paraphrasing skills (mean = 2.90) and preparing teaching materials (mean = 2.55). Its effectiveness in enhancing academic writing aligns with its widespread use.

Mavis Beacon: Low integration (average mean = 2.35), with mean scores ranging from 2.25 to 2.45, reflecting its limited prioritization in business education curricula due to a focus on typing and digital literacy rather than advanced analytical skills.

The study identified significant barriers to AI integration, including inadequate technological infrastructure, limited AI literacy among educators, lack of professional development, and ethical concerns such as data privacy and algorithmic bias. These challenges are particularly pronounced in public universities in Edo State, where resource constraints and resistance to technological change hinder adoption.

The theoretical framework combined Constructivism, Technology Acceptance Model (TAM), and Self-Determination Theory (SDT). Constructivism supported AI's role in fostering student-centered, experiential learning through personalized and interactive environments. TAM highlighted adoption barriers due to low perceived ease of use and usefulness, emphasizing the need for training. SDT underscored AI's potential to enhance motivation through autonomy, competence, and relatedness, while cautioning against over-reliance that could undermine critical thinking.

Conclusion

Based on the findings of the study, it was concluded that the integration of AI tools offers significant advantages to business education in tertiary institutions. Chatgpt emerged as a highly beneficial tool, widely utilized by both students and educators. Quillbot contribute to higher- quality student assignment and assist lecturer in preparing well structured teaching materials. Zotero helps in strengthening research and referencing practices. Mavis Beacon contribute positively by improving typing speed and proficiency.

The finding suggest that increased awareness, training, and institutional support would further maximize the benefits of AI tools in business education.

Recommendations

Based on the findings, the following recommendations are proposed to enhance the integration of AI tools in business education classrooms in tertiary institutions in Edo State and Delta State:

Enhance Faculty Training and AI Literacy:

Universities should implement comprehensive professional development programs focusing on AI literacy, including hands-on training with tools like ChatGPT, Zotero, QuillBot, and Mavis Beacon. Workshops should emphasize practical applications in pedagogy, ethical considerations, and data-driven decision-making to boost educators' confidence and competence.

Invest in Technological Infrastructure:

Policymakers and university administrators should prioritize investments in reliable internet, modern hardware, and AI-compatible software to address infrastructure limitations. Public-private partnerships could help secure funding for these upgrades, ensuring equitable access to AI tools for all students and educators.

Integrate AI into Curricula:

Business education programs should embed AI-related topics, such as machine learning, prompt engineering, and AI ethics, into core courses to prepare students for AI-driven workplaces. Curricula should include experiential learning through AI-driven simulations and projects to foster critical thinking and innovation.

Promote Ethical AI Use:

Institutions should develop clear policies on ethical AI use, addressing data privacy, algorithmic bias, and academic integrity. Incorporating AI ethics into the curriculum through case studies and role-playing exercises can equip students to navigate ethical dilemmas responsibly.

Foster Collaborative Learning Environments:

Leverage AI platforms to support group-based activities, such as assigning tasks based on student strengths and monitoring group dynamics. This approach can enhance teamwork skills, mirroring professional business settings.

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APPENDIX I

Department of Business Education,
Faculty of Vocational and Technical
Education.

University of Benin,
Benin City, Nigeria

August, 2025.

Dear Respondent,

REQUEST FOR COMPLETION OF ITEMS IN THE QUESTIONNAIRE

I am a final year student of the above-named department/institution. I am conducting a research on, “Integration of AI Tools in Business Education Classroom for the Teaching and Learning Process in Tertiary institutions”. This research is in partial fulfillment of the requirement for the award of a Bachelor degree in Business Education.

I will be very grateful, if you assist me with useful answers by completing the questionnaire below. I assure you that your responses will be treated with confidentiality and the information given will be used strictly for the purpose of this academic work.

Thank you for your understanding and cooperation.

Yours faithfully,

Mubinat

Researcher.

APPENDIX II

QUESTIONNAIRE

Instruction: Please kindly tick [√] the appropriate option below

SECTION A: Demographic Data

Instruction: please tick (√) the appropriate responses in the boxes below

Gender: Male () Female ()

SECTION B: Research Variables

Instruction: in this part, you are required to tick (√) as you find Appropriate:

Key: Very High Extent (VHE), High Extent (HE), Low Extent (LE), Very Low Extent (VLE)

S/N	ITEMS	VHE	HE	LE	VLE
RQ1	To what extent is ChatGPT AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?				
1.	ChatGPT AI tools are frequently used by educator in business education classrooms for teaching purposes.				
2.	I regularly utilize ChatGPT AI tools to support my learning activities				
3.	I regularly utilize ChatGPT AI tools to support my assignment				
4.	I regularly utilize ChatGPT AI tools to support my research and study				
5.	ChatGPT helps to improve problem-solving skills in business				

	education.				
6.	ChatGPT helps to improve critical thinking				
RQ2	To what extent is Zotero AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?				
7.	Educators use zotero A.I tools for effective training				
8.	Zotero AI tools are effective in enhancing the teaching and learning experience				
9.	Zotero AI tools are well-integrated into the curriculum or course materials of business education programs in my university.				
10.	Educators utilize Zotero AI tools to support their learning activities				
11.	Educators utilize Zotero AI tools to support their managing citations				
12.	Zotero is widely used by lecturers to organize and share research materials in business education courses.				
13.	Zotero is seamlessly integrated into the teaching and learning process to enhance research skills in business education.				
RQ3	To what extent is Quillbot AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?				
14.	QuillBot AI tools are frequently used by educators to preparing teaching materials				
15.	QuillBot AI tools is frequently used to support paraphrasing content,				

	and improving academic writing				
16.	QuillBot AI tools are effective in enhancing the teaching and learning experience in business education classrooms.				
17.	I regularly use Quillbot to improve my writing and paraphrasing skills in business education assignments.				
18.	Quillbot is commonly used by lecturers to assist in creating or refining teaching materials for business education.				
RQ4	To what extent is Marvis Beacon AI tools currently integrated into the teaching and learning processes in business education classrooms in tertiary institutions?				
19	Mavis Beacon AI tools are frequently used by business educators to enhance typing skills				
20.	Mavis Beacon AI tools are frequently used by business educators to improve digital literacy				
21.	Mavis Beacon AI tools are effective in enhancing the teaching and learning experience				
22.	Marvis Beacon is actively use to enhance productivity in business education tasks.				
23	Marvis Beacon is well-integrated into the curriculum to improve technical skills in business education.				

APPENDIX III

OUTPUT OF RELIABILITY OF THE STUDY

Scale: ALL VARIABLES

Case Processing Summary

	N	%
Valid	20	100.0
Cases Excluded ^a	0	.0
Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.837	20

APPENDIX IV

OUTPUT OF RESEARCH QUESTIONS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q1	69	1	4	2.75	.85
Q2	69	1	4	2.90	.78
Q3	69	2	4	3.10	.72
Q4	69	1	4	2.96	.80
Q5	69	1	5	2.80	.82
Q6	69	1	4	2.65	.88
Valid N (listwise)	69				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00001	6	2.65	3.10	2.875	.08155
VAR00002	6	.57	.87	.7124	.11812

Valid	N	6				
(listwise)						

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q7	69	1	4	2.30	.95
Q8	69	2	4	2.40	.90
Q9	69	1	4	2.20	.98
Q10	69	2	4	2.25	..92
Q11	69	1	4	2.60	.87
Q12	69	2	4	2.35	.94
Q13	69	1	4	2.28	.93
Valid	N	69			
(listwise)					

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00003	7	2.20	2.60	2.403	.12861
VAR00004	7	.67	1.00	.8366	.14459
Valid N (listwise)	7				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q14	69	1	4	2.55	.89
Q15	69	1	4	2.85	.81
Q16	69	2	4	2.70	.84
Q17	69	1	4	2.90	.79
Q18	69	1	4	2.60	.86
Valid N (listwise)	69				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00005	5	2.55	2.90	2.725	.11054
VAR00006	5	.67	.97	.8116	.10822
Valid N (listwise)	5				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q19	69	1	4	2.45	.97
Q20	69	2	4	2.40	.95
Q21	69	1	4	2.35	.93
Q22	69	1	4	2.30	.96
Q23	69	1	4	2.25	.98
Valid N (listwise)	69				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00007	5	2.25	2.45	2.35	.1732
VAR00008	5	.65	1.12	.8340	.17695
Valid N (listwise)	5				