



Investigating the impact of AI on accounting education: Evaluating technological infrastructure and resource availability in South Africa

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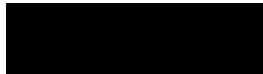
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DEDICATION

I want to dedicate this work to the following people who were/are important in my life.

To my wife and son for their support and understanding as the pressure of work and studying meant that I spent less time with them. Finally, I dedicate this work to all my foundation phase and high school teachers, who planted a seed and now it has grown into a big tree.

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ABSTRACT

Artificial Intelligence (AI) is revolutionizing industries by automating routine tasks, enhancing data analysis, and enabling informed strategic decision-making. The accounting sector is no exception, where AI plays a critical role in increasing efficiency and improving outcomes. As AI adoption grows, integrating this technology into accounting education becomes essential to equip graduates with the skills required to thrive in a dynamic, technology-driven workforce. In South Africa, however, higher education institutions (HEIs) face numerous obstacles in achieving this integration. Challenges such as inadequate technological infrastructure, insufficient faculty expertise, and a pronounced digital divide marked by disparities between urban and rural regions significantly hinder progress. These issues exacerbate inequities in access to AI-driven learning tools and methodologies. This study leverages a systematic literature review (SLR), structured through the PRISMA framework, to assess the readiness of South African HEIs to incorporate AI in accounting education. Key factors evaluated include the availability of technological resources, the current state of faculty training, and the socio-economic barriers impacting equitable adoption. The findings highlight stark disparities in resource distribution and training quality, underscoring the pressing need for systemic reforms. To address these challenges, the research recommends targeted interventions such as policy amendments to prioritize technology in education, substantial investment in upgrading infrastructure, and comprehensive capacity-building programs for educators. These strategies aim to close existing gaps, ensuring equitable access to high-quality AI education. Ultimately, such measures will empower South African HEIs to produce graduates equipped for global competitiveness, while also fostering socio-economic growth through an AI-literate workforce. Several South African universities are integrating AI into accounting education. Leading institutions include University of Pretoria, Johannesburg, UCT, Stellenbosch, Wits, NWU, CPUT, DUT, and UNISA. They use AI for tutoring, analytics, auditing, taxation, and remote learning. However, rural and underfunded institutions lag due to poor infrastructure and limited resources.

Keywords: Artificial Intelligence (AI), Technological Infrastructure and Technological Resources, accounting education, Faculty expertise, and the Digital Divide.

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LISTS OF ACRONYMS

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
AIS	Accounting Information System
CASP	Critical Appraisal Skills Programme
CPUT	Cape Peninsula University of Technology
CLT	Cognitive Load Theory
DUT	Durban University of Technology
ERP	Enterprise Resource Planning
EU	European Union
HEI	Higher Education Institution
ICT	Information and Communication Technology
IFAC	International Federation of Accountants
LMS	Learning Management System
ML	Machine Learning
MOOC	Massive Open Online Course
NLP	Natural Language Processing
NWU	North-West University
POPIA	Protection of Personal Information Act
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RBV	Resource-Based View
RPA	Robotic Process Automation
SA	South Africa
SAICA	South African Institute of Chartered Accountants
SAIPA	South African Institute of Professional Accountants
SLR	Systematic Literature Review
TAM	Technology Acceptance Model
UCT	University of Cape Town
UNISA	University of South Africa
UNESCO	United Nations Educational Scientific and Cultural Organization
WEF	World Economic Forum

CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

Artificial intelligence (AI) has been introduced as a fascinating technology that tries to imitate the concepts of human cognitive skills.

The study's focus on integrating Artificial Intelligence (AI) into accounting education within South African higher education institutions. It outlines the growing importance of AI in the accounting profession and the urgent need for academic programs to align with industry demands (Kokina & Davenport, 2017; Sangster et al., 2020). The chapter highlights challenges such as inadequate technological infrastructure, limited faculty expertise, and the digital divide between urban and rural institutions (Van Dijk, 2020; Moodley & Adam, 2022; Coetzee & Schmulian, 2021). It presents the research problem, objectives, and key questions guiding the study, emphasizing the need for systemic reforms to prepare graduates for an AI-driven workforce (Ngcobo & Maseko, 2022; Dlamini, 2021). This chapter sets the foundation for the rest of the dissertation by framing the context, significance, and direction of the research (Schwab, 2016; SAICA, 2023).

The Fourth Industrial Revolution (4IR) has accelerated the uptake of AI technologies across all aspects of our lives (Mhlanga, 2021). The Fourth Industrial Revolution (4IR)—a global shift driven by technologies like AI and automation (Schwab, 2016; Mhlanga, 2021). It's transforming industries, including accounting, by replacing routine tasks with smart systems (Kokina & Davenport, 2017). For education, this means universities must update curricula to equip students with AI skills, or risk leaving graduates unprepared for the modern workforce (Sangster et al., 2020; Coetzee & Venter, 2020).

Modern artificial intelligence is changing the way education, as well as improving banking and accounting systems with AI in different business processes (Lardo et al, 2022). It may be the most multifaceted, transformative, and disruptive 4IR technology as described by Kommunuri (2022). AI technology is growing fast, forcing change in the accounting profession. AI, which used to be the stuff of dreams and science fiction is anything but that today it's making work (Kokina & Davenport, 2017). Interpreting data computation algorithms, performing image recognition tasks, and decision automation in finance. The paper is exploratory research to

determine the technological infrastructure, resources, and support systems that are necessary for incorporating AI in the accounting curricula of South African higher education institutions (Coetzee & Venter, 2020).

The accounting landscape is being increasingly shaped by automation and AI, leading to a widening gulf between the skills of new graduates and those required in the workplace (Sangster et al. 2020). As the workforce environment changes, it is essential to educate future accounting professionals on how to use AI in their work (Howieson et al, 2014). For this purpose, the research focuses on investigating the level of AI integration in accounting curricula at South African universities including available technological resources and challenges as possible impediments to successful implementation (Coetzee & Venter 2020).

The South African case is particularly complex and challenging due to difficulties in closing the digital divide, a situation that poses barriers to quality education and equity (Van Dijk, 2020). It is even more relevant in the AI-enabled era, which demands a lot of technology back-end and a highly skilled workforce (Schwab, 2016). The study further examines the essential hardware, software, and digital tools that could be suitable for delivering quality AI education in the accounting environment in South Africa (Coetzee & Venter, 2020). It also explores the economic, infrastructural as well as human resources limitations that pose a barrier to the successful integration of AI in accounting syllabi among South African institutions of higher education (Stancheva-Todorova & Plumb 2019).

1.2 Background of the Study

AI as a term was named during an academic summer in 1955 at Dartmouth College. John McCarthy coined the term “artificial intelligence” at this conference and proposed that a machine could perform tasks like humans. McCarthy was awarded the Turing Award, which is granted to those who have made a significant impact in AI. The definition of AI is an old and debated topic, for a loose sense informal definitions have been given by researchers such as Legg & Hutter (2007). As defined by McCarthy (2007), AI is yes indeed "the science and engineering of making intelligent machines, especially intelligent computer programs."

If technological improvements, especially in the field of AI are considered then the accounting landscape is evolving as well. For instance: there is research that insinuates that AI can master elements of accounting like bookkeeping and reporting, which are activities used by

accountants for years, then the next step would be courses being provided in institutions that will have to accommodate changes as well. There are concerns that new graduates may not be ready to work in a job market where AI will play such an important role. This is confirmed by the South African Institute of Professional Accountants (SAIPA), which reports that, although automation will replace certain jobs in accounting, there will be more demand for accountants able to use AI tools.

The rapid pace of change in the accounting field has made it imperative to integrate AI into our curricula (Kokina & Davenport, 2017). South African universities are confronted with problems in the development of program alignment to respond to 4th Industrial Revolution demands, together with the ongoing need for increased access and equity (Schwab, 2016). The objective of this paper is to assess the current technology infrastructure and resource availability of accounting programs in South Africa as well as recommend action for closing the AI education divide (Coetzee & Venter, 2020).

The need to incorporate AI within the realm of accounting education is paramount. As the accounting industry adopts AI-driven, financial software at an ever-growing pace, students must learn not only about those principles but also be able to use them more effectively. New technologies require well-honed technical skills and be subjected to higher-order thinking by innovation (Howieson et al., 2014). The latter aspect is particularly relevant in the South African setting, where a new 4IR-type scenario will only act as an exacerbating factor throwing existing unequal access to education and employment opportunities into stark contrast (Van Dijk 2020).

In response to this COVID-19 crisis, South African universities need a good heart-driven look at their resources. The evaluation, however, needs to include hardware and software provision, internet connectivity reliability as well technical experience of lecturers & the financial implications related to continuous professional development/refining curriculum (Coetzee & Venter, 2020). Accounting programs that do not have the necessary information technology (IT) infrastructure and pedagogical know-how will find it challenging to train students for evolving career skills (Stancheva-Todorova & Plumb, 2019).

Information and Communication Technology (ICT) is a key element to improve the quality of the teaching & learning process as well as increase knowledge building in smart schools. ICT media immerse students into a digital universe that provides many more opportunities to weave

cultural, linguistic, and content expertise together—especially in the case of language instruction. ICT integration aims to enable it to be used for teaching better and more effectively (Paudel, 2021).

In line with this, Jayanthi & Kumar (2015) observed that integrating ICT into existing pedagogies drives both students and teachers to produce good education. However, this may create a digital divide due to unequal accessibility of ICT facilities and not having access to reliable internet, which can limit the availability of these tools in remote or economically disadvantaged areas.

ICT has also increased the interaction between students and digital tools, both online as well as physical, which makes it a good technological-based service. It fosters independence, commitment, and reflective learning (Goertler, 2020). Referring to Goertler (2020), it was stressed that online education allows for self-directed learning and real-life resources thereby enhancing interactive communication during educational activities. In addition, ICT provides a well-organized online learning environment that is very helpful during emergency circumstances such as in the state pandemic when conventional resources are running out (Goertler, 2020).

There is an emerging consensus on the importance of implementing AI in accounting education to ensure graduates are adequately equipped for the demands of twenty-first-century work-life (Sangster, Stoner, & Flood 2020). However, South African universities face considerable challenges in introducing AI education successfully (Coetzee & Venter, 2020).

1.2.1 Global Context

AI is impacting industry on a global scale, and the world of accounting is no different. AI could automate mundane tasks, assist in data analysis, and offer real-time financial intelligence (Deloitte, 2017; Pan & Seow, 2016).

Giant firms like Deloitte, PwC, and KPMG are making massive investments in AI technologies to improve the quality of audits as well as increase efficiency from better working papers they have adopted (Deloitte 2017). Such a global orientation is compelling accounting professionals to be skilled around AI and accordingly educational institutions across the globe are aligning their syllabi towards it (Pan & Seow, 2016).

1.2.2 Regional Context

The integration of AI into accounting education in Africa has been hampered by various systemic and infrastructural barriers (World Economic Forum, 2021). These include a limited technological knowledge base, inadequate infrastructure, insufficient funding for educational programs (UNESCO,2022), and a lack of qualified faculty (African Development Bank,2020). While some African countries are beginning to explore the potential of AI in their educational systems, the digital divide remains significant emphasizing the urgency of addressing these disparities to ensure equitable access to quality education (Tetteh et al,2022).

1.2.3 National Context

The 4th Industrial Revolution is forcing a rethink of priorities, especially within the sphere of accounting in South Africa. To do so, the South African Institute of Chartered Accountants (SAICA) acknowledges that AI needs to be embedded in accounting education within an evolving global landscape. However, many South African universities, including institutions such as the University of Limpopo and Walter Sisulu University—often ranked lower in global higher education indices—still grapple with outmoded curricula, insufficient technology kits, and a scarcity of AI-knowledgeable faculty (Coetzee & Venter, 2020)."

It is important to understand and address these concerns as part of ensuring that graduates are better prepared for challenges they face now or will likely encounter at some point in their accounting profession career.

1.2.4 Local Context

AI must form part and parcel of their syllabi, as with many South African institutions, the University encounters challenges and difficulties surrounding technological infrastructure capabilities and resource allocation regarding financial support for various sections of constituents who not only have to function effectively in their respective academic work environments but particularly when it comes to investing time into faculty training (Coetzee & Venter, 2020). Therefore, the objective of this study is to offer a holistic view of these challenges and possible solutions that can be implemented to further AI education in accounting making students more equipped for future workforce opportunities. Around the world, AI is becoming a staple in accounting education. Developed countries have been at the forefront of

this effort, with universities providing AI tools and developing specialized courses (Lawson et al., 2019), such as machine learning for healthcare, ethical AI design, AI policy and governance, and data-driven decision-making in public administration."

It is not surprising that these institutions are recognizing the importance of arming students with tools to manage an automated and data-driven accounting world. In turn, the graduates from these programs will have a strong foundation to apply AI technology in their line of work and begin pushing innovation and efficiency into accounting.

1.3 Problem Statement

The integration of AI into accounting education is crucial for equipping graduates with the skills required to navigate the (4IR) and the increasingly data-driven nature of the accounting profession, including data analytics, algorithmic thinking, digital literacy, predictive modeling, and ethical reasoning in the use of AI tools. "However, higher education institutions in South Africa face significant challenges in adopting AI in their curricula due to systemic barriers in technological infrastructure, resource availability, and faculty capacity. These barriers threaten to widen the skills gap, reduce employability, and hinder the nation's global competitiveness in the field of accounting (Schwab, 2016; Van Dijk, 2020). One of the primary challenges is the digital divide between urban and rural institutions. Urban universities often possess advanced technological systems and AI-compatible tools, whereas rural institutions grapple with outdated hardware, unreliable internet connectivity, and frequent power outages. This disparity limits equitable access to AI-driven learning, exacerbating educational inequalities (Moodley & Adam, 2022; Coetzee & Schmulian, 2021). Globally, approximately 80% of universities have adopted AI-compatible infrastructure, compared to just 35% in South Africa, underscoring the urgency of addressing this technological gap (UNESCO, 2021). Financial constraints further impede progress. Many institutions lack the funding required to acquire AI tools, software licenses, and advanced infrastructure. Additionally, limited investments in faculty training programs have left 70% of accounting educators without exposure to AI technologies, rendering them ill-equipped to teach AI-integrated curricula. Rural institutions are particularly disadvantaged, with minimal resources for professional development and curriculum enhancements (Ngcobo & Maseko, 2022; Dlamini, 2021). Another significant obstacle is the misalignment of accounting curricula with the evolving demands of the profession. Current programs fail to incorporate AI-driven tools such as robotic process automation (RPA), machine learning, and data analytics, leaving graduates unprepared for

modern workforce requirements. Moreover, many students face challenges in engaging with AI technologies due to gaps in digital literacy and inadequate training (Coetzee & Schmulian, 2021; Biyela & Thwala, 2023). Without targeted interventions to address these challenges, South African higher education institutions risk deepening educational inequities and failing to prepare graduates for the demands of an AI-driven workplace.

While AI integration is advancing globally, South African higher education institutions face unique challenges in aligning curricula with industry demands—particularly in balancing technological adoption across diverse socio-economic and geographic settings. A notable gap exists in understanding how these disparities affect student preparedness, especially between urban and rural institutions.

This research aims to critically evaluate the current state of AI integration in South African accounting education, identify disparities between urban and rural institutions, and propose targeted strategies for equitable curriculum development that aligns with the demands of the Fourth Industrial Revolution

1.4 Objective of the Study

Research objectives serve as the guiding framework for any academic study, outlining the specific goals the investigation seeks to achieve. In this dissertation, the primary focus is exploring the integration of AI into accounting education within South African higher education institutions. This exploration is critical in understanding how technological advancements, particularly AI, can bridge skill gaps, enhance curriculum design, and prepare accounting graduates for the demands of an evolving, data-driven industry. The objectives below are therefore relevant to this study:

- Identify and analyze the specific technological infrastructure and resources required for effective AI education in accounting programs.
- Assess the capacity of South African higher education institutions to provide the necessary infrastructure, resources, and learning environment for AI education in accounting.
- Investigate the challenges and barriers South African institutions face in meeting the technological and resource requirements for effective AI integration in accounting education.

1.5 Research Questions

Research questions are central to framing the focus and scope of a study, providing a clear pathway to explore and address the identified problem. In this dissertation, the below research questions are designed to investigate the integration of AI into accounting education within South African higher education institutions.

- What specific technological infrastructure and resources are essential for delivering effective AI education in accounting programs within the South African context?
- To what extent do South African higher education institutions currently possess the necessary technological infrastructure, resources, and learning environments to support AI education in accounting?
- What are the primary challenges and barriers hindering South African institutions from meeting the technological and resource requirements for successful AI integration in accounting education?

1.6 Significance of the Study

This study is significant as it addresses the critical need for integrating AI into accounting education in South Africa, focusing on overcoming challenges in technological infrastructure, faculty expertise, and curriculum alignment. By exploring barriers such as the digital divide and financial constraints, the research highlights strategies to enhance the quality and accessibility of AI-driven education, ensuring graduates are equipped for the demands of the Fourth Industrial Revolution (Schwab, 2016; Moodley & Adam, 2022).

The study contributes to:

- **Educational Equity:** Bridging the gap between urban and rural institutions through targeted interventions.
- **Workforce Readiness:** Preparing students with AI-related skills for a competitive job market.
- **Policy Guidance:** Offering evidence-based recommendations for resource allocation and curriculum design
- **Economic Development:** Supporting a tech-skilled workforce to foster innovation and growth.

1.7 Limitations of the Study

The study employs a systematic literature review (SLR) methodology, relying on secondary data from existing research and reports. While this provides valuable insights, it limits the ability to capture real-time challenges and localized nuances of AI integration in South African accounting education (Mhlanga & Moloji, 2020). Primary data collection through surveys or interviews would offer a deeper, context-specific understanding. The findings are drawn from studies across diverse contexts, both globally and locally. Although this approach highlights comparative insights, it risks overgeneralizing challenges and solutions without fully accounting for South Africa's unique socioeconomic and institutional disparities (Van Dijk, 2020; Ngcobo & Maseko, 2022). The availability and quality of secondary data pose significant constraints. Some relevant information may be outdated, inconsistent, or inaccessible due to privacy regulations or proprietary restrictions. This limits the study's ability to provide the most current and comprehensive analysis (UNESCO, 2021). The study focuses on broad themes such as infrastructure and faculty expertise but does not delve into the operational intricacies of individual institutions. This restricts its capacity to offer tailored recommendations for specific universities or regions (Coetzee & Schmulian, 2021). The research primarily evaluates technological and institutional readiness, overlooking the direct experiences and perspectives of students. Including how these perspectives could enhance the understanding of digital literacy gaps and engagement with AI tools (Biyela & Thwala, 2023). AI adoption in accounting education is a rapidly evolving field, and new technologies or pedagogical strategies may emerge after the study's completion. This dynamic nature limits the long-term applicability of the findings and recommendations.

1.8 Overview of the Study

Chapter 1: Overview of the Study

This chapter provides a foundation for understanding the research problem and its context. It begins by introducing the transformative impact of Artificial Intelligence (AI) on industries globally, with a focus on accounting. The chapter outlines the research problem, objectives, and significance of integrating AI into accounting education within South African higher education institutions. Key research objectives and questions are introduced, highlighting the challenges posed by technological infrastructure gaps, faculty expertise, and the digital divide. The chapter concludes with an outline of the dissertation structure and a synopsis of subsequent chapters.

Chapter 2: Literature Review

The literature review delves into the theoretical and empirical foundations of AI integration in accounting education. It examines global, regional, and national perspectives, addressing the evolving demands of the Fourth Industrial Revolution (4IR). The chapter synthesizes existing research, exploring themes such as technological readiness, faculty training, and socio-economic barriers. Theoretical frameworks like the Technology Acceptance Model (TAM) and Cognitive Load Theory (CLT) guide the analysis. This chapter sets the stage for evaluating South Africa's readiness to embrace AI in accounting curricula through a comprehensive review of scholarly articles, government reports, and industry insights

Chapter 3: Methodology

This chapter outlines the systematic approach employed to investigate the research questions. A Systematic Literature Review (SLR) framework, guided by the PRISMA methodology, was selected to ensure a rigorous and transparent analysis of secondary data. The methodology section details the study's inclusion and exclusion criteria, data sources, and analysis techniques. By focusing on peer-reviewed literature, institutional reports, and global best practices, this chapter aims to provide a robust foundation for addressing the challenges of integrating AI into accounting education in South Africa.

Chapter 4: Data Presentation and Analysis

Chapter 4 presents the findings derived from the systematic literature review. The analysis focuses on themes such as transparency indexes, technological readiness, and faculty expertise. Data is systematically categorized and visualized through tables, charts, and thematic maps to highlight disparities in AI adoption across South African institutions. Comparative insights are drawn from global benchmarks, showcasing the gaps between urban and rural universities. This chapter emphasizes the practical implications of the findings, providing a detailed understanding of the challenges and opportunities within the South African context.

Chapter 5: Summary, Conclusions and Recommendations

The final chapter synthesizes the study's findings, offering actionable conclusions and recommendations. It revisits the research objectives and evaluates the extent to which they were achieved. The chapter proposes targeted interventions, such as investing in technological infrastructure, enhancing faculty training, and bridging the digital divide, to ensure equitable AI integration in accounting education. Future research areas are suggested, emphasizing the

need for longitudinal studies and primary data collection to build upon the insights presented in this dissertation.

1.9 Conclusion

Chapter 1 establishes a comprehensive foundation for this study on the integration of AI into accounting education within the South African context. It highlights the transformative impact of AI as a pivotal Fourth Industrial Revolution technology, underscoring its potential to revolutionize the accounting profession and education. However, it also outlines significant challenges, including technological infrastructure gaps, limited faculty expertise, and the pervasive digital divide, which hinder equitable adoption across South African higher education institutions. The chapter defines the research problem as the urgent need to align accounting education with industry demands for AI-driven competencies while addressing systemic barriers that exacerbate educational inequities. Through clearly articulated objectives and research questions, it frames the study's intent to evaluate the readiness of South African institutions and propose actionable solutions for effective AI integration. The significance of this research lies in its potential to foster workforce readiness, bridge digital disparities, and enhance the global competitiveness of South African graduates in an AI-centric accounting environment. By providing an overview of the study's scope, rationale, and methodology, Chapter 1 sets the stage for subsequent chapters, where theoretical and empirical evidence will be synthesized to explore challenges, opportunities, and strategies for integrating AI in accounting education. The insights from this chapter reinforce the critical importance of innovative approaches to overcoming barriers and preparing accounting students for a rapidly evolving technological landscape.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter explores the AI in accounting education, focusing on the South African context. It draws on global research and theoretical frameworks to understand how AI can enhance learning and prepare students for the evolving demands of the accounting profession. The chapter highlights both the opportunities, such as personalized learning and automation, and the challenges, including poor infrastructure, limited faculty expertise, and the digital divide between urban and rural institutions. By reviewing empirical studies and implementation strategies, the chapter sets the foundation for assessing South Africa's readiness to adopt AI in accounting education and identifies key areas for intervention.

The integration of AI in education has emerged as a transformative approach to addressing the evolving demands of modern learning environments. Within the accounting discipline, the rapid development of AI technologies has the potential to revolutionize traditional educational practices by enhancing learning outcomes, streamlining administrative tasks, and bridging skill gaps. As industries increasingly adopt AI-driven solutions for tasks like data analysis, fraud detection, and financial forecasting, it becomes imperative that accounting education aligns with these advancements to prepare students for the future of work (Balarabe & Akinyele, 2023; Dai & Lin, 2023). Globally, AI has been leveraged in higher education to deliver personalized learning, automate assessment processes, and improve the scalability of instructional models (UNESCO, 2022). However, the application of these technologies in the context of accounting education, particularly in resource-constrained settings like South Africa, presents unique challenges and opportunities. While AI offers the potential to democratize access to quality education and align curricula with industry needs, it also raises significant ethical and practical considerations, including issues of data privacy, algorithmic bias, and unequal access to technology (Moodley & Naicker, 2021; World Bank, 2023). This literature review systematically examines the opportunities, strategies, and challenges associated with integrating AI into accounting education. By synthesizing existing research and identifying actionable insights, this review aims to provide a comprehensive understanding of how AI can enhance accounting education while addressing its ethical and practical implications. Special attention is given to the South African context, where the potential for AI-driven educational reform intersects with pressing socio-economic needs and systemic disparities in access to technology and resources (Choudhury & Khan, 2021). This review critically examines the

technological infrastructure, resource requirements, and barriers to integrating AI into accounting education, with an emphasis on South Africa.

2.2 Theoretical Review of Literature

Integrating AI in accounting education draws on several theoretical frameworks to help account for and extend our understanding. These bodies of theory cover the learning process, technology adoption, and the wider socio-technical systems that impact AI use in education. The following are the central theories responsible.

2.2.1 Technology Acceptance Model (TAM)

The technology acceptance model (TAM) provides a foundational framework for understanding how educators and students perceive and adopt AI technologies. It emphasizes two critical factors: perceived usefulness and perceived ease of use (Davis, 1989). In accounting curricula, these factors influence attitudes toward AI tools like robotic process automation (RPA) and machine learning (ML). For instance, educators in South Africa may be more inclined to adopt AI-driven tools if they perceive them as effective in improving learning outcomes and reducing administrative burdens (Mpofu & Mpofu, 2023). However, challenges such as inadequate AI literacy among faculty highlight the importance of professional development programs to enhance the ease of use and overall acceptance of these technologies.

Adopting AI tools in South African universities is influenced by faculty training, student digital literacy, and institutional resources. Funda & Piderit (2024) emphasize the need for targeted capacity-building initiatives to enhance the acceptance and effective use of AI in education.

2.2.2 Diffusion of Innovations Theory

The diffusion of innovations theory explains how new technologies, such as AI, spread within educational systems. This theory is particularly relevant for understanding the disparities in AI adoption across urban and rural institutions. Early adopters, often urban universities with better resources, pave the way for broader implementation (Rogers, 1962). However, compatibility with existing curricula and visible benefits, like improved student outcomes, significantly influence adoption rates. Addressing infrastructural disparities in rural areas is essential to accelerate the diffusion of AI technologies and bridge the educational divide (Mpofu & Mpofu, 2023).

2.2.3 Constructivist Learning Theory

Constructivist learning emphasizes active, experiential learning where students construct knowledge through interaction with their environment. AI tools like data visualization platforms and intelligent tutoring systems align with this theory by providing real-world, problem-solving scenarios in accounting education. For example, simulation-based learning with AI enables students to analyze complex financial datasets, fostering critical thinking and hands-on experience (Lee, 2024). This approach is particularly important in preparing students for data-driven roles in the accounting profession.

2.2.4 Resource-Based View (RBV)

The resource-based view (RBV) highlights the importance of institutional resources, including digital infrastructure, skilled faculty, and financial investment, in successfully integrating AI into accounting education. Institutions with abundant resources are better positioned to adopt AI tools and foster innovation in teaching methods (Barney, 1991). However, the digital divide in South Africa exemplifies disparities in resource allocation, necessitating partnerships between academia, industry, and government to build capacity and ensure equitable access (Mpofu & Mpofu, 2023). The digital divide theory examines how unequal access to technology impacts learning opportunities. In South Africa, this theory is critical for understanding the challenges rural institutions face in implementing AI tools, such as unreliable internet access and insufficient funding for advanced computing systems (Moodley & Adam, 2022). Bridging this divide requires strategic investments in digital infrastructure and targeted interventions to provide affordable technology to underserved communities (UNESCO, 2022).

2.2.5 Digital Divide Theory

The digital divide theory highlights disparities in access to technology based on socio-economic and geographical factors. In South Africa, many rural institutions face significant challenges in implementing AI, including poor internet connectivity, lack of funding for high-performance computing, and limited digital literacy among educators (Moodley & Adam, 2022). Addressing this divide requires strategic investments in digital infrastructure, affordable AI tools, and localized training programs. Policymakers must prioritize technology access in underprivileged regions to ensure inclusive and equitable AI adoption in accounting education.

(UNESCO, 2022). Moreover, institutional policies should focus on digital inclusivity by integrating AI training into professional development programs for educators.

2.2.6 Cognitive Load Theory (CLT)

Cognitive load theory (CLT) focuses on the mental effort required to process and learn new information. AI tools can reduce cognitive load by automating repetitive tasks, such as grading and data entry, allowing students to focus on higher-order thinking skills. For example, natural language processing (NLP) tools like ChatGPT can simplify complex accounting concepts, enhancing student understanding and engagement (Sweller, 1988; Ballantine et al., 2024). However, careful integration is necessary to avoid over-reliance on AI, which could hinder the development of independent problem-solving abilities.

2.2.7 Ethical Considerations in AI Adoption

Ethical considerations are paramount in integrating AI into accounting education. Frameworks that emphasize transparency, accountability, and equity are essential to address concerns about data privacy, algorithmic bias, and the potential erosion of critical thinking skills. Educating students about ethical AI use ensures they are prepared to navigate the challenges of deploying AI responsibly in professional settings (Choudhury & Khan, 2021).

2.2.8 Conclusion

The theoretical perspectives discussed provide a comprehensive understanding of the factors influencing AI adoption in accounting education. The Technology Acceptance Model highlights the role of perceived usefulness and ease of use, while the Diffusion of Innovations theory explains disparities in AI adoption across different institutions. Constructivist learning theory underscores the importance of interactive AI-based learning, and the Resource-Based View emphasizes the need for institutional investment in AI infrastructure. The Digital Divide Theory sheds light on accessibility challenges, while Cognitive Load Theory illustrates AI's potential in enhancing learning efficiency. Lastly, ethical considerations ensure AI's responsible integration into academia. Addressing these factors collectively will facilitate AI's effective and equitable implementation in accounting education, ensuring that both educators and students benefit from technological advancements.

2.3 Empirical Literature Review

The empirical literature on the integration of AI in accounting education provides valuable insights into the challenges, opportunities, and institutional readiness for adopting AI technologies. In this section, we explore key empirical studies that align with the research objectives and questions of this dissertation, focusing on the integration of AI in accounting curricula, technological infrastructure requirements, faculty readiness, and barriers faced by educational institutions, especially in the context of South Africa.

2.3.1 AI Applications on Accounting Education

AI tools like ChatGPT and Google Bard are reshaping accounting education by enhancing learning outcomes through personalized instruction, automation of routine tasks, and analytical problem-solving. For instance, ChatGPT excels in explaining concepts, applying rules, and conducting ethical evaluations, though it struggles with financial statement creation and technical accounting tasks (Cheng et al., 2023). Google Bard has also been integrated into accounting curricula to bridge theory and practice but raises concerns about over-reliance and data privacy (Arabiat & Alshurafat, 2023). Globally, tools such as chatbots are utilized to assist with routine tasks, provide legislative updates, and minimize errors, thereby elevating the profession's status while reducing manual workloads (Zadorozhnyi et al., 2023). In South Africa, the adoption of AI tools remains nascent but promising, with a growing emphasis on aligning educational technologies with the evolving needs of the profession and the local context, including addressing social challenges through critical and human-centered approaches (Ballantine et al., 2024). These developments call for balanced use to foster critical thinking, align with pedagogical principles, and prevent the erosion of human-centric education models. The incorporation of AI in accounting education is reshaping the discipline by introducing advanced technologies and methodologies, fostering innovation, and addressing traditional inefficiencies. In South Africa, as well as neighboring Zimbabwe, AI adoption in accounting education is still in its early stages. This slow progress is linked to systemic challenges such as a lack of digital infrastructure, limited access to technology, and insufficient training for educators and students in AI tools. Efforts are underway to develop ethical AI frameworks aligned with national policies, emphasizing the importance of collaboration between academic institutions, industries, and research bodies. Such partnerships aim to integrate AI education into curricula and enhance digital literacy among educators to accelerate adoption and effectiveness (Mpofu & Mpofu, 2023).

Globally, AI is driving a paradigm shift in accounting education, emphasizing the need to transition from traditional technical approaches to more critical and interdisciplinary pedagogies. Tools like large language models and machine learning algorithms are being utilized to teach advanced data analysis, automate routine tasks such as data entry and reconciliation, and support decision-making processes in accounting practices. Educators are now encouraged to prepare students to navigate an AI-dominated landscape that requires strong analytical, ethical, and problem-solving skills, ensuring they can handle the complexities of modern accounting systems (Ballantine et al., 2024). Despite these advancements, challenges such as data privacy concerns, ethical dilemmas, and the risk of over-reliance on AI technologies persist, underscoring the need for balanced integration.

In practical applications, AI technologies like ERP systems and expert systems enhance efficiency in processing large datasets, automating repetitive tasks, and providing strategic insights. However, they lack contextual understanding and emotional intelligence, creating risks such as misinterpretation of data or reliance on incomplete analyses. These limitations necessitate a continued role for human judgment, especially in areas requiring regulatory compliance and ethical decision-making (Korol & Romashko, 2024). As seen globally, educational institutions are responding to these dynamics by revising curricula to include AI competencies while addressing the evolving demands of the accounting profession (Zhang et al., 2020). South African universities must accelerate efforts to integrate AI technologies into their accounting programs. This requires addressing foundational challenges, including the digital divide and resource limitations, while fostering a broader understanding of the societal and ethical implications of AI in accounting (Coetzee & Venter, 2020; Moodley & Adam, 2022). By adopting AI-driven tools and methodologies, South African institutions can ensure their graduates are globally competitive and equipped to meet the demands of modern accounting practices (Biyela & Thwala, 2023; Mpofu & Mpofu, 2023). These changes align with global trends emphasizing the integration of technology in education to build a workforce adept at navigating an increasingly automated world (UNESCO, 2022; World Bank, 2023).

2.3.2 AI-Specific Technology Infrastructure and Resources Essential for Accounting Programs in South Africa

A significant body of empirical research underscores the critical role of technological infrastructure in AI education. The integration of AI tools into accounting curricula requires specialized hardware, software, internet connectivity, and digital learning platforms. These

resources are pivotal to enabling students to acquire the necessary skills and experience in AI technologies. Empirical studies confirm that modern computing infrastructure is necessary for the delivery of AI-based education. For instance, Kokina and Davenport (2017) highlight that the use of powerful computers capable of handling large datasets and running complex algorithms is essential for AI training in accounting. Similarly, in their study on AI integration in accounting education, Lardo et al. (2022) found that access to software tools such as Python for machine learning and Tableau for data visualization significantly enhances students' learning experiences. In the South African context, however, studies by Coetzee and Venter (2020) and Ngcobo and Maseko (2022) reveal that many institutions lack the technological capacity to support these advanced tools. This infrastructure gap limits the effectiveness of AI education, particularly in rural and underfunded institutions. Reliable internet access is another essential factor for the successful implementation of AI in accounting curricula. Studies such as those by Stancheva-Todorova and Plumb (2019) emphasize the importance of high-speed internet in enabling cloud-based learning and facilitating access to AI tools. In a study conducted in South Africa, Moodley and Adam (2022) observed that rural universities face significant challenges related to internet connectivity, which hampers the ability of students and faculty to fully engage with AI technologies. Moreover, the importance of digital learning platforms has been emphasized by several scholars. For example, Howieson et al. (2014) stress that digital platforms, such as Learning Management Systems (LMS), can enhance the learning experience by providing interactive AI tools and fostering collaborative learning. These platforms are essential for institutions aiming to provide flexible and accessible AI education, especially in South Africa, where geographical disparities and limited access to physical infrastructure persist (Van Dijk, 2020).

Implementing AI-driven accounting education in South Africa requires a robust foundation of technology and resources to address existing challenges like limited digital infrastructure and a lack of training. Accounting information systems (AIS) provide essential tools for managing financial data. Investments in AIS significantly enhance organizational performance and are vital for teaching students about financial decision-making and reporting. In Nigeria, similar systems have been shown to improve net profits by 62.57% when implemented effectively (Onaolapo, 2024). Cloud-based platforms and enterprise resource planning (ERP) systems cloud platforms enable scalable storage and processing capabilities, critical for handling the large datasets AI applications require. ERP systems integrated with AI functionalities automate accounting tasks like reconciliations and financial forecasting, offering students hands-on

experience with industry-standard tools (Malyutin et al., 2018). Data security and compliance tools ensure the security of sensitive accounting data is critical. Tools like encrypted data channels and secure communication protocols are indispensable for maintaining academic and operational integrity, as highlighted by European supercomputing initiatives that rely on such technologies for accurate and secure operations (Reetz et al., 2007). Human resources educators play a crucial role in integrating AI into teaching practices. However, many accounting lecturers in South Africa lack the technical expertise or training required to use AI tools effectively. Nkosi (2020) found that 68% of educators surveyed felt unprepared to incorporate AI into their teaching due to limited exposure and inadequate professional development opportunities.

South Africa's educational institutions face significant disparities in technological access. Urban universities and private institutions generally have more advanced infrastructure, including high-speed internet and updated computer systems. However, rural and township schools struggle with outdated equipment, unreliable internet connections, and insufficient budgets for technological upgrades (Van Zyl, 2019; Mabaso, 2020). Many schools and universities in rural areas lack stable internet connectivity, which is a critical requirement for using AI-powered tools. According to Govender et al. (2021), only 22% of rural institutions in South Africa have reliable broadband access. Outdated computers and devices are common in many public institutions, making it difficult to run sophisticated AI software or online platforms (Mabaso, 2020). This hardware gap limits students' exposure to technology-driven learning environments.

Globally, institutions like the Massachusetts Institute of Technology (MIT) and Stanford leverage these resources to run advanced AI courses integrated with financial data analytics and real-world simulations (Lee, 2024). In South Africa, the University of Pretoria's AE-Bot demonstrates how AI-driven tutoring systems can simulate real-world scenarios in accounting. However, this innovation is contingent on consistent access to high-speed internet and cloud resources, which remain limited in rural areas (University of Pretoria, 2024). Learning platforms and personalization AI-enabled learning platforms, such as Coursera and Knewton, tailor educational content to individual student needs, tracking progress and adapting content delivery dynamically (Dai & Lin, 2023). South Africa's potential for integrating similar platforms remains underexplored, particularly in underfunded institutions.

2.3.3. Current Technological Readiness in South African Institutions

Uneven technological capacity while global benchmarks indicate a strong adoption of AI-compatible infrastructure, South Africa lags significantly, with only 35% of institutions equipped for AI integration compared to 80% globally (UNESCO, 2021). This disparity is evident in comparisons between urban and rural institutions. Urban university institutions like the University of Johannesburg employ AI tools for financial analytics training, providing students with industry-relevant skills (University of Johannesburg, 2022). Rural institutions face challenges such as frequent power outages, limited internet access, and outdated hardware significantly hinder AI adoption, widening the digital divide (Moodley & Adam, 2022).

Regional and international comparisons of neighboring countries like Kenya have initiated AI readiness programs through partnerships with global tech companies, addressing infrastructural gaps and fostering local expertise (World Economic Forum, 2021). South Africa can draw lessons from these initiatives to accelerate AI adoption in its education system. South Africa faces unique challenges in integrating AI into accounting education. These challenges can be broadly categorized into infrastructure, curriculum alignment, and faculty readiness.

Urban institutions generally possess better technological resources compared to their rural counterparts. For example, universities in metropolitan areas may have access to high-speed internet and modern laboratories, whereas rural institutions often struggle with outdated equipment and frequent power outages (Moodley & Adam, 2022). Many South African universities have not yet incorporated AI-driven tools such as data analytics or robotic process automation into their accounting programs. This misalignment leaves graduates underprepared for the demands of the modern workforce (Biyela & Thwala, 2023). According to Coetzee and Venter (2020), approximately 70% of accounting educators in South Africa have limited exposure to AI technologies. This lack of expertise hinders their ability to effectively teach AI concepts and applications.

2.3.4 Challenges Hindering AI integration in Accounting Education

Policy and ethical considerations also pose challenges. Developing countries are still in the early stages of crafting ethical frameworks and policies that align AI education with broader socio-economic goals. These frameworks are essential to balance technological adoption with concerns about data privacy, ethical AI use, and the risk of over-reliance on technology, which

might undermine critical thinking skills in accounting (Mpofu & Mpofu, 2023). Financial constraints further exacerbate the problem, as institutions struggle to allocate resources for AI tools, teacher training, and curriculum development. Lastly, socio-cultural factors, including resistance to change and skepticism about the relevance of AI in traditional accounting practices, slow the adoption process. Encouraging collaboration between academic institutions and industry, investing in infrastructure, and providing educators with ongoing AI training are critical steps for overcoming these challenges and enabling a seamless transition to AI-enhanced accounting education. Despite its benefits, integrating AI into accounting education presents several challenges. Infrastructural disparities, particularly in rural areas, limit the adoption of AI-driven learning solutions. Addressing these barriers requires substantial investment in digital infrastructure and subsidized technology access programs. Studies reveal that AI algorithms trained on non-representative datasets can perpetuate existing biases. In diverse contexts such as South Africa, this poses a risk of marginalizing underserved populations (UNESCO, 2022). For instance, AI systems might favor students with access to more data-rich environments, reinforcing educational inequities.

The reliance on AI systems on large datasets raises concerns about compliance with data protection laws like South Africa's Protection of Personal Information Act (POPIA). Unregulated data collection can lead to breaches of student privacy and misuse of sensitive information (Choudhury & Khan, 2021). Faculty and institutional reluctance to adopt AI technologies is often rooted in a lack of familiarity with the tools or skepticism about their effectiveness. Addressing this resistance requires focused training and awareness campaigns (Balarabe & Akinyele, 2023). Critics caution against excessive dependence on AI, which may erode critical thinking and problem-solving skills among students. Overuse of AI tools for tasks like financial forecasting might reduce students' ability to interpret complex datasets independently (Dai & Lin, 2023).

Systemic barriers and challenges persist, including economic inequalities, and budgetary constraints that prevent many institutions from acquiring AI-compatible technologies and training programs. This issue is particularly acute in rural areas, where institutions rely on limited funding for basic operational needs (Dlamini, 2021). The absence of national AI education policies exacerbates gaps in governance, leading to fragmented implementation strategies (Choudhury & Khan, 2021). Faculty and pedagogical limitations educators are often unprepared to teach AI-driven accounting tools due to a lack of exposure and training

opportunities. Ngcobo and Maseko (2022) note that structured faculty development programs are essential for equipping educators with the requisite skills.

Research by Van Dijk (2020) and Moodley and Adam (2022) highlights that the technological gap between urban and rural institutions limits access to AI-based education, exacerbating existing educational inequalities. This divide is not only related to access to hardware and software but also to internet connectivity and reliable power supplies, which are fundamental for AI-based learning. Limited financial resources further impede AI integration, particularly in underfunded institutions. Coetzee and Venter (2020) and Ngcobo and Maseko (2022) note that many universities struggle to secure the necessary funds to invest in AI tools, software licenses, and faculty training. These financial limitations are most pronounced in rural areas, where funding for technological infrastructure is minimal.

Empirical studies indicate that South African accounting programs are not adequately aligned with the evolving needs of the AI-driven accounting profession. Biyela and Thwala (2023) found that current accounting curricula often neglect to incorporate key AI technologies such as machine learning, robotic process automation, and big data analytics. This misalignment means that graduates are often ill-prepared for the demands of modern accounting roles. The integration of AI in education also faces resistance from faculty and administrators, particularly in institutions that have not yet embraced technology in their pedagogical practices. Howieson et al. (2014) suggest that overcoming this resistance requires clear communication regarding the long-term benefits of AI and the incorporation of AI tools into daily accounting practice.

2.3.5 Impact of AI on Accounting Education

Integrating AI in South African universities for accounting education is reshaping learning methods but remains hindered by significant infrastructural challenges. Studies highlight that AI-enhanced tools can revolutionize learning environments, enabling intelligent learning, resource sharing, and active engagement in distance education (Funda & Piderit, 2024). However, the availability of robust technological infrastructure and resources is critical for effective AI integration. Research conducted at the University of Johannesburg emphasizes the need for curricula to adapt by incorporating advanced software and simulations, which can enrich theoretical understanding and practical skills in accounting (Karodia, 2015). Moreover, a review of secondary schools in South Africa reveals similar challenges, with a lack of funding and trained ICT personnel being major obstacles (Seleke et al., 2022). This underscores a

broader systemic issue affecting the higher education sector. Despite these hurdles, educators have shown a positive attitude toward technology-enhanced learning, signalling the potential for growth if infrastructural gaps are addressed. Comprehensive strategies involving governmental and private support are necessary to fund ICT improvements, provide continuous training, and integrate AI-driven tools that align with modern accounting standards.

AI is profoundly transforming the accounting profession by enhancing efficiency, accuracy, and decision-making capabilities. AI technologies like machine learning, robotic process automation and natural language processing automate repetitive tasks such as data entry and bookkeeping, enabling accountants to focus on strategic functions like fraud detection and financial analysis. However, adopting AI introduces challenges, including data security, ethical dilemmas, and the need for robust governance frameworks to manage AI applications effectively (Bhavya et al., 2024). Accountants must upskill to navigate AI tools, adapting to their evolving roles within this technologically enhanced landscape (Segura et al., 2024).

To integrate AI effectively into accounting curricula, educational institutions should emphasize interdisciplinary learning that combines technical skills with core accounting knowledge. Incorporating programming tools such as Python into coursework has shown promise in equipping students with data analysis skills relevant to modern accounting challenges (Lee, 2024). Efforts in South Africa and Zimbabwe to develop ethical AI frameworks and address barriers such as the digital divide highlight the importance of infrastructure and training for successful implementation (Mpofu & Mpofu, 2023). Additionally, aligning AI education with practical industry needs, fostering collaborations between academia and the corporate sector, and ensuring AI literacy among educators is essential for curriculum evolution (Ballantine et al., 2024).

AI is reshaping accounting education by transforming curricula, teaching methods, and the required skill sets for future accountants. In South Africa and across Africa, AI education focuses on training in AI tools and promoting equitable access to technology to bridge the digital divide and ensure inclusive learning opportunities. These initiatives aim to empower students with the necessary skills to thrive in an increasingly technology-driven world while addressing socio-economic disparities in access to digital resources (Moodley & Naicker, 2021).

Nevertheless, educational reforms are underway, focusing on incorporating AI literacy into curricula to align graduates' skills with market demands. South African universities, for example, are urged to integrate AI-driven methodologies, including machine learning and robotic process automation, into accounting programs to prepare students for the evolving job landscape (De Silva Lokuwaduge, 2024).

Globally, AI's impact is profound, requiring a redesign of accounting education to emphasize technical proficiency, critical thinking, and ethical decision-making. Universities worldwide are leveraging AI to enhance student learning by automating routine tasks, advanced data analytics, and virtual simulations. This approach not only improves operational efficiency but also develops students' ability to address complex decision-making challenges in accounting. However, the integration of AI brings ethical dilemmas, data privacy issues, and the risk of over-reliance on automated processes, emphasizing the need for balanced human oversight (Brabete et al., 2024). In Africa, the potential for AI in accounting education lies in its ability to democratize learning through remote and adaptive platforms, enabling wider access to quality education. However, barriers such as the digital divide and inconsistent policy support hinder its full potential. Globally, institutions are leading reforms by fostering collaborations with industries to ensure that accounting graduates are equipped with AI competencies, ensuring relevance in an AI-driven job market (Saad, 2024). These reforms emphasize the strategic alignment of accounting education with the technological advancements shaping the profession, thereby ensuring a competitive and future-ready workforce.

One of the pioneers, emerging from South Africa is the University of Pretoria which has been using AI tools in one of its courses taught to accounting students. AI technologies like automated assessment tools and intelligent tutoring systems can be used by the university to enhance both undergraduate learning as well as postgraduate on-campus programs tools used automated grading systems these tools grade student performances on accounting problems and go as far as to provide instant feedback. More complex teaching elements, the likes of personalized mentorship and curriculum development can become a center stage for educators if routine grading tasks are automated (Coetzee & Schmulian, 2021). These AI-based platforms essentially provide a platform that encourages students to learn at their own pace. Systems like these can adjust learning materials to customized packages that are more beneficial for each student, resulting in better results. Students claimed that artificial intelligence devices have enabled students to imbibe intricate accounting ideas relatively

quickly with the help of customized learning channels and instantaneous feedback. Students could devote more of their academic resources to meeting, high-level accounting problems rather than rote exercises.

The integration of AI in education has gained momentum as institutions recognize its potential to transform learning experiences. Countries like the United States, China, and India have invested heavily in AI-driven educational technologies, focusing on personalized learning, automation, and scalable solutions for large student populations (Zawacki-Richter et al., 2019). United States AI tools such as adaptive learning platforms and virtual teaching assistants have been widely adopted to enhance student engagement and streamline administrative tasks (Seow & Pan, 2021). The Chinese government has prioritized AI in education as part of its national strategy, leading to significant advancements in intelligent tutoring systems and AI-powered analytics (Ghatak et al., 2022). In developing economies like India, AI has been leveraged to bridge gaps in teacher availability and access to quality resources, like the challenges faced in South Africa (Govender et al., 2021).

The University of Johannesburg uses AI instruments in its accounting subjects to enhance students' data literacy and analytic capabilities, already offering them the upcoming new tech-intensive jobs in accounting (University of Johannesburg 2022). AI Integration works with tech companies to deliver modules in financial planning, auditing, and risk management featuring AI-driven data analysis and predictive modeling (University of Johannesburg 2022). It has been reported that this process also better students' employability as the experience of using software is now practical (University of Johannesburg, 2022).

Stellenbosch University research looks at AI in the accounting education sector aiming to reshape teaching practice and curricula examined based on data-driven analysis for skills deficits (Stellenbosch University, 2023). The institution uses AI to analyze the performance of students and support bespoke instruction, while case studies have been developed to emulate authentic accounting practice (Stellenbosch University 2023). Curriculum design, based on data analysis will eventually help programs to keep abreast with the industry by focusing on the latest advancements in data analytics and automation (Stellenbosch University, 2023).

University of Cape Town (UCT) has introduced AI-supported assessment tools for its accounting courses that target automatic grading and customized feedback to enhance the learning process. Utilization of AI uses an assessment and feedback system utilizing artificial

intelligence to evaluate student submissions and provide targeted feedback, integrated with adaptive quizzes to focus attention on areas requiring further work (University of Cape Town 2023). Allowing educators to grade more quickly and providing students with feedback that is timely, the new system enhances student learning (University of Cape Town 2023). The simulation of AI-based ethical training modules into the education framework by SAICA in modern accounting includes essential topics such as data privacy, anti-money laundering, and fair decision-making related to automated processes. These modules aim to equip students with practical skills and ethical awareness to handle complex scenarios in technology-driven accounting environments effectively (SAICA, 2023). Advanced AI Integration utilizes AI in these advanced modules as a teaching partner to pose realistic ethical dilemmas and constantly change the learning scenarios based on student responses leading to individualized instruction for each user (SAICA, 2023). Graduates are more equipped to deal with ethical dilemmas in technology-enriched financial roles, an important skill as organizations shift towards AI-innovative solutions (SAICA 2023).

AI tools are used in budgeting and forecasting, among other applications (University of Pretoria 2023). AI tools are integrated into courses that can be applied to financial modelling and forecasting, using historical data for analysis to predict the likely future outcomes (University of Pretoria, 2023). Being an applied AI training, it is focused on the delivery of practical predictive analytics and automation skills, hence readiness for the most demanding tech-enabled (predictive/analytical) roles in the finance services market today (University of Pretoria, 2023).

North-West University (NWU) offers an AI-enhanced curriculum focused on teaching accounting students about fraud detection and risk assessment using AI-powered tools (North-West University, 2023). AI Integration NWU incorporates AI software that simulates fraud detection scenarios and risk assessment processes, allowing students to practice identifying anomalies in financial statements and applying predictive analytics for risk management. This initiative has equipped students with practical skills in fraud detection, a critical skill given the increasing sophistication of financial fraud. Students learn to use data analytics and machine learning, preparing them for roles in forensic accounting and risk management (North-West University, 2023).

The University of the Witwatersrand (wits) incorporates AI-based financial modelling within its accounting and finance programs, helping students master complex financial forecasting

and strategic planning (University of the Witwatersrand, 2023). Wits uses AI-powered financial modelling software to simulate real-world scenarios in corporate finance, allowing students to explore and model outcomes of different financial strategies, investment options, and economic changes. Students gain hands-on experience with financial modelling tools and can apply predictive analytics in business decision-making processes. This program helps students develop skills in strategic financial analysis, which is increasingly valuable in the private and public sectors (University of the Witwatersrand, 2023).

Cape Peninsula University of Technology (CPUT) has integrated AI into its accounting program, specifically in the areas of auditing and automated financial reporting, to modernize the learning experience for students (Cape Peninsula University of Technology, 2023). AI integration the university leverages AI-powered auditing software that automates parts of the auditing process, such as data entry, reconciliation, and variance analysis. This enables students to learn how to manage and interpret automated audit reports. By working with automated auditing tools, students gain valuable exposure to AI-driven audit workflows, an essential skill in large accounting firms and financial institutions where AI is increasingly used to streamline auditing tasks (Cape Peninsula University of Technology, 2023).

Durban University of Technology (DUT) has introduced AI applications in its taxation courses to teach students how to handle compliance and regulatory requirements using AI-assisted software (Durban University of Technology, 2023). The curriculum includes AI-based tools for processing and analyzing tax data, allowing students to simulate tax filing, compliance checks, and detect discrepancies in tax records. This program provides students with the skills needed to operate in tax management roles that use AI for compliance, automating tasks like data verification, and improving accuracy in tax filing processes. This training is particularly relevant as tax compliance becomes more complex and automated (Durban University of Technology, 2023).

University of South Africa (UNISA), as an open distance learning institution, has integrated AI to improve accessibility and personalize the learning experience for accounting students across South Africa (University of South Africa, 2023). The university uses AI-driven learning platforms to provide personalized study recommendations, automated assessments, and real-time feedback for remote accounting students. These tools help students identify areas needing improvement, even when studying independently. AI has enhanced the effectiveness of remote learning at UNISA, making it easier for students across South Africa to access quality

accounting education. The personalized feedback mechanism has helped students improve performance and engagement in online courses (University of South Africa, 2023).

Universities have recognized the transformative impact of AI on accounting and have adjusted their curricula accordingly. Developed countries, including the United States, the United Kingdom, and Australia, are at the forefront of integrating AI-driven tools into accounting education. United States and United Kingdom institutions such as Stanford University and the London School of Economics offer specialized courses in AI and accounting. These programs focus on emerging technologies such as machine learning, data analytics, and robotic process automation. The aim is to produce graduates who can not only operate AI tools but also understand their implications for decision-making and ethical considerations (Pan & Seow, 2016). Australia Universities in Australia have collaborated with professional accounting bodies to embed AI into their education systems. For example, Chartered Accountants Australia and New Zealand (CA ANZ) have supported the development of AI-integrated accounting modules to ensure alignment with industry demands (Lawson et al., 2019).

Major firms such as Deloitte, PwC, and KPMG have incorporated AI into their operations, necessitating graduates who are proficient in these technologies. Deloitte's AI-driven audit tools, for instance, provide real-time financial insights, reducing human error and increasing efficiency (Deloitte, 2017). This industry push highlights the urgency for educational institutions to align their curricula with technological advancements.

2.3.6 Opportunities in AI driven Accounting Education

Personalized and adaptive learning platforms powered by AI, such as Knewton and Coursera, enable tailored educational experiences. These systems analyze students' performance data and learning behaviors to provide customized resources, remedial content, and progress tracking (Dai & Lin, 2023). This personalization is especially valuable in technical fields like accounting, where mastery of foundational concepts such as financial reporting and auditing is critical. Skill development for industry readiness is facilitated by AI tools, which bridge the gap between theoretical knowledge and practical application. Platforms like QuickBooks and Tableau provide experiential learning opportunities in tasks such as data visualization, financial analysis, and the automation of accounting processes, ensuring students gain the skills required for modern industry demands (Balarabe & Akinyele, 2023). Research highlights that AI-

integrated learning equips students with competencies demanded by employers, such as proficiency in predictive analytics and fraud detection (World Bank, 2023)

AI-driven remote and inclusive learning solutions present a significant opportunity to address disparities in educational access, particularly in regions with limited resources, such as South Africa. By utilizing AI-powered remote learning tools, students in under-resourced areas gain access to high-quality instruction and interactive content, which can help close educational gaps (Moodley & Naicker, 2021). Technologies such as AI-powered translation and speech recognition tools, including Google Translate, further promote inclusivity by accommodating South Africa's diverse linguistic landscape, thus making education more accessible across different language groups.

AI systems also enhance efficiency in teaching and administration. Platforms like Grade Scope automate routine administrative tasks such as grading, thereby reducing the workload on educators and enabling them to focus more on pedagogy (Choudhury & Khan, 2021). Simultaneously, automated feedback mechanisms provide students with immediate and consistent evaluations, fostering a more efficient and personalized learning experience.

Moreover, AI plays a pivotal role in modernizing curricula to meet the demands of a rapidly evolving job market. Analytics-driven insights into emerging trends, such as robotic process automation (RPA) and ethical AI considerations, ensure that curricula remain relevant to industry standards (UNESCO, 2022). Institutions integrating tools like QuickBooks and ERP systems in accounting courses equip students with practical skills that align with professional demands, thereby enhancing their employability (Lee, 2024).

Promoting equity in education remains a core advantage of AI, as adaptive learning platforms offer personalized educational experiences, particularly benefiting students in underserved areas. The University of South Africa's AI-based remote learning initiatives exemplify how education can be democratized on a larger scale (University of South Africa, 2023). Furthermore, the incorporation of AI into teaching methodologies encourages experiential learning through simulations and real-world applications, fostering critical thinking and innovation. This approach, as demonstrated by the University of Pretoria, empowers students to develop essential problem-solving skills (University of Pretoria, 2024).

In conclusion, AI integration in education is not only addressing existing inequalities but also preparing students for the future by aligning educational practices with technological advancements and workforce demands. However, continued efforts are required to address ethical implications, ensure accessibility, and sustain curriculum relevance to maximize the potential of AI in education.

2.3.7 Strategies for Effective implementation of AI in Accounting Education

Professional development programs should train educators in using AI tools such as Tableau and Gradescope. Workshops can address both technical skills and ethical considerations, ensuring that educators can critically assess AI outputs and maintain pedagogical integrity (Choudhury & Khan, 2021). Institutions can partner with AI vendors and industry stakeholders to develop customized educational tools. For instance, collaborations with firms like SAP or Xero can give students exposure to real-world accounting technologies (Balarabe & Akinyele, 2023). Introducing AI tools in pilot projects allows institutions to evaluate their impact before scaling up. For example, testing adaptive learning platforms in introductory accounting courses can reveal insights into their effectiveness and areas for improvement (UNESCO, 2022).

Governments and institutions must prioritize digital infrastructure development. Programs providing affordable internet access, subsidized devices, and AI-ready facilities are critical to bridging the digital divide (World Bank, 2023). Establishing clear guidelines for ethical AI use in education is essential. These should include data governance policies, mechanisms for addressing algorithmic bias, and accountability structures for AI-driven decision-making (Moodley et al., 2023).

2.3.8 Addressing Strategies for Effective AI Integration

To bridge the technological gap, targeted investments in infrastructure are critical in Public-private partnerships collaborations with tech companies, such as Google and Microsoft, can provide subsidized tools and platforms for educational institutions (Mpofu & Mpofu, 2023). Government initiatives and policies aimed at universal internet access, particularly in underserved areas, would address foundational gaps in connectivity.

Faculty training programs should prioritize both technical and ethical aspects of AI. Certifications in tools like Python, Tableau, and RPA would enhance educators' ability to teach

AI-integrated curricula effectively. Collaborative workshops with industry stakeholders can further build capacity (Balarabe & Akinyele, 2023).

Modern accounting curricula must integrate interdisciplinary modules that combine AI technologies with traditional accounting principles. These updates should include AI competencies modules on data analytics, fraud detection, and predictive modeling. Ethical considerations in education on ethical AI use, including data privacy and algorithmic fairness, are essential to prepare students for the challenges of an AI-driven workplace by equipping them with the knowledge and skills to navigate ethical dilemmas, ensure compliance with legal standards, and promote equitable and responsible use of AI technologies (Ballantine et al., 2024). Establishing governance frameworks that address ethical and operational aspects of AI adoption is essential. These frameworks should promote equitable access to AI-driven education including data governance policies to safeguard student information (Choudhury & Khan, 2021). Awareness campaigns targeting educators, students, and policymakers can demystify AI's role in education. These campaigns should emphasize the potential of AI to enhance learning outcomes without undermining human-centric educational values (Moodley & Adam, 2022). South Africa can adopt best practices from global leaders in AI integration, such as Singapore's investment in AI-focused teacher training and adaptive learning platforms. United States partnerships between universities and tech firms to develop AI-driven accounting tools (Deloitte, 2017).

2.4 Conclusion

The integration of AI into accounting education presents transformative opportunities for aligning curricula with the evolving demands of the Fourth Industrial Revolution. This review underscores the significant role of AI technologies—such as machine learning, robotic process automation (RPA), and natural language processing (NLP)—in enhancing learning outcomes, addressing skill gaps, and improving operational efficiencies within accounting education (Kokina & Davenport, 2017; Mpofu & Mpofu, 2023). Despite the substantial potential, South African higher education institutions face critical barriers, including limited technological infrastructure, inadequate faculty training, and the persistent digital divide, which disproportionately affects rural institutions (Van Dijk, 2020; Coetzee & Schmulian, 2021). Globally, AI's integration in education is driving curriculum modernization and fostering skills essential for a data-driven economy. However, the South African context is marked by socio-economic disparities that necessitate targeted interventions such as infrastructure development,

comprehensive training programs for educators, and policies to bridge the digital divide (Moodley & Adam, 2022; UNESCO, 2022). Addressing these challenges is imperative to ensure equitable access to AI-enhanced education and to prepare graduates for the technology-centric accounting profession of the future.

The integration of AI into accounting education offers transformative opportunities for aligning curricula with the demands of the Fourth Industrial Revolution. However, systemic barriers such as economic constraints, limited faculty expertise, and infrastructural disparities must be addressed. A multi-pronged approach that includes infrastructure investments, curriculum reforms, faculty development, and policy interventions is essential for realizing AI's potential in South Africa. By drawing on global best practices and leveraging local strengths, South African institutions can produce graduates equipped to excel in an AI-driven professional landscape. Future research should focus on longitudinal studies to monitor the impact of implemented AI education strategies, and the development of ethical frameworks tailored to the South African socio-economic context (Ballantine et al., 2024). By tackling these issues, South Africa can position itself to produce globally competitive graduates equipped with the technological acumen necessary for modern accounting role

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The research methodology outlines the approach employed to address the objectives of the study, focusing on the integration of (AI) in accounting education within South African higher education institutions. A qualitative, exploratory research design was adopted, utilizing a Systematic Literature Review (SLR) framework (Tranfield, Denyer, & Smart, 2003). This chapter details the research design, data collection methods, analysis techniques, and ethical considerations adopted for the study. A systematic literature review (SLR), guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, was chosen to ensure a comprehensive, transparent, and rigorous synthesis of existing research. An elaboration on the design choices, differentiation between qualitative and quantitative methods, and a comprehensive rationale for the chosen approach is provided.

3.2 Research Design

This study utilized a qualitative, exploratory research design through a Systematic Literature Review (SLR) approach. The PRISMA framework was employed to identify, screen, and synthesize relevant literature systematically (Tranfield, Denyer, & Smart, 2003). The research focused on secondary data sources, such as peer-reviewed articles, institutional reports, and global best practices (UNESCO, 2022; World Bank, 2023). This approach was appropriate for understanding the challenges, opportunities, and strategies related to AI integration in accounting education (Coetzee & Venter, 2020; Mpofu & Mpofu, 2023). Qualitative research was selected for its ability to capture rich, contextual insights that are particularly relevant for exploring complex and multifaceted issues like technological readiness, faculty expertise, and infrastructural disparities in South Africa (Moodley & Adam, 2022; Ngcobo & Maseko, 2022). Qualitative methods focus on understanding phenomena through detailed, subjective exploration of experiences, perceptions, and contexts (Creswell & Poth, 2018). Conversely, quantitative methods emphasize numerical data and statistical analysis to test hypotheses and establish generalizable patterns. For this study, the qualitative approach was deemed more suitable as it allows for an in-depth synthesis of diverse perspectives from existing literature. This is particularly critical given the nascent state of AI integration in South Africa and the socio-economic disparities influencing its implementation.

An SLR was chosen as the primary method to systematically collect, evaluate, and synthesize existing knowledge. This approach ensures comprehensive coverage of relevant literature while mitigating bias. By focusing on peer-reviewed articles, institutional reports, and global best practices, the SLR provides a robust foundation for understanding AI integration challenges and opportunities. For example, studies by Kokina and Davenport (2017) and Howieson et al. (2014) have successfully used SLR to explore the integration of emerging technologies in accounting education, demonstrating its effectiveness in synthesizing complex, multidisciplinary insights. The use of the PRISMA framework enhances the methodological rigor and transparency of the review process.

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework is widely used to ensure methodological rigor in systematic reviews, particularly in evaluating reliability and validity. A study analyzing the PRISMA protocol's application in risk management surveys found that while the approach enhances methodological consistency, its validity can be compromised when studies fail to report statistical rigor, particularly in construct and content validity (López Domínguez et al., 2024). Similarly, research validating the PRISMA-7 questionnaire for frailty screening demonstrated high intra- and inter-rater reliability, confirming its diagnostic accuracy through rigorous translation and cross-cultural adaptation (Yeung et al., 2024). However, qualitative approaches within PRISMA-based studies often remain underdeveloped. Qualitative expansion in PRISMA methodologies involves integrating thematic analysis, narrative synthesis, and contextual evaluation, which enhances interpretive depth. For instance, a systematic review of preschool screening tools using PRISMA showed that predictive validity could be strengthened by incorporating qualitative assessments alongside quantitative measures (Sim et al., 2019). This highlights the need for a mixed-methods approach, where qualitative synthesis complements statistical validation, thereby addressing cultural, contextual, and conceptual gaps in systematic reviews.

3.3 Population and Sampling

The study's population included published research articles, conference proceedings, institutional reports, and policy documents addressing AI integration in accounting education. The inclusion criteria encompassed materials published between 2019 and 2024, focusing on the South African context or developing countries with comparable challenges in technological infrastructure, digital access, and faculty development.

A purposive sampling technique was employed—this non-probability method allowed for the intentional selection of sources based on their relevance, quality, and alignment with the study’s objectives. This approach was deemed appropriate due to the exploratory nature of the research, which aimed to capture context-rich insights rather than generate statistically generalizable results. By focusing on studies that directly addressed key themes—such as AI in education, digital inequality, and curriculum innovation—the sampling strategy ensured that the final literature set would provide deep, focused understanding of the topic.

A total of 1,250 records were identified through database and manual searches. After applying the inclusion criteria and screening for relevance and methodological rigor, 85 studies were selected for final synthesis. These studies provided both conceptual and empirical evidence necessary to explore the challenges, strategies, and opportunities associated with integrating AI in accounting education in South Africa.

3.4 Data Collection and Sources

Data were collected from multiple academic databases, including Scopus, Web of Science, and Google Scholar, as well as gray literature such as government reports and policy documents. Search terms included combinations of keywords like "Artificial Intelligence," "accounting education," "South African higher education," "technological infrastructure," and "digital divide." A standardized data extraction template was used to capture key details such as publication year, geographical focus, AI tools discussed, and challenges identified.

3.5 Data Analysis

Thematic analysis was conducted to synthesize data into coherent themes aligned with the study’s objectives. Key themes identified included technological infrastructure readiness, faculty expertise, and barriers to AI integration. Quantitative insights were derived from visualizations such as tables and charts to contextualize disparities between urban and rural institutions. The analysis emphasized comparative insights from global benchmarks to understand the gaps in South African institutions.

The PRISMA flow diagram depicted below in Figure 3.1 serves as a visual tool commonly utilized in systematic reviews and meta-analyses to represent the progression of information through the various steps of the review process (Page et al. 2021). It graphically details the

procedure for choosing publications for review, from the identification of the study to the decision of whether to include or exclude it. The following explains what typically occurred in each part of the PRISMA flow diagram related to this study:

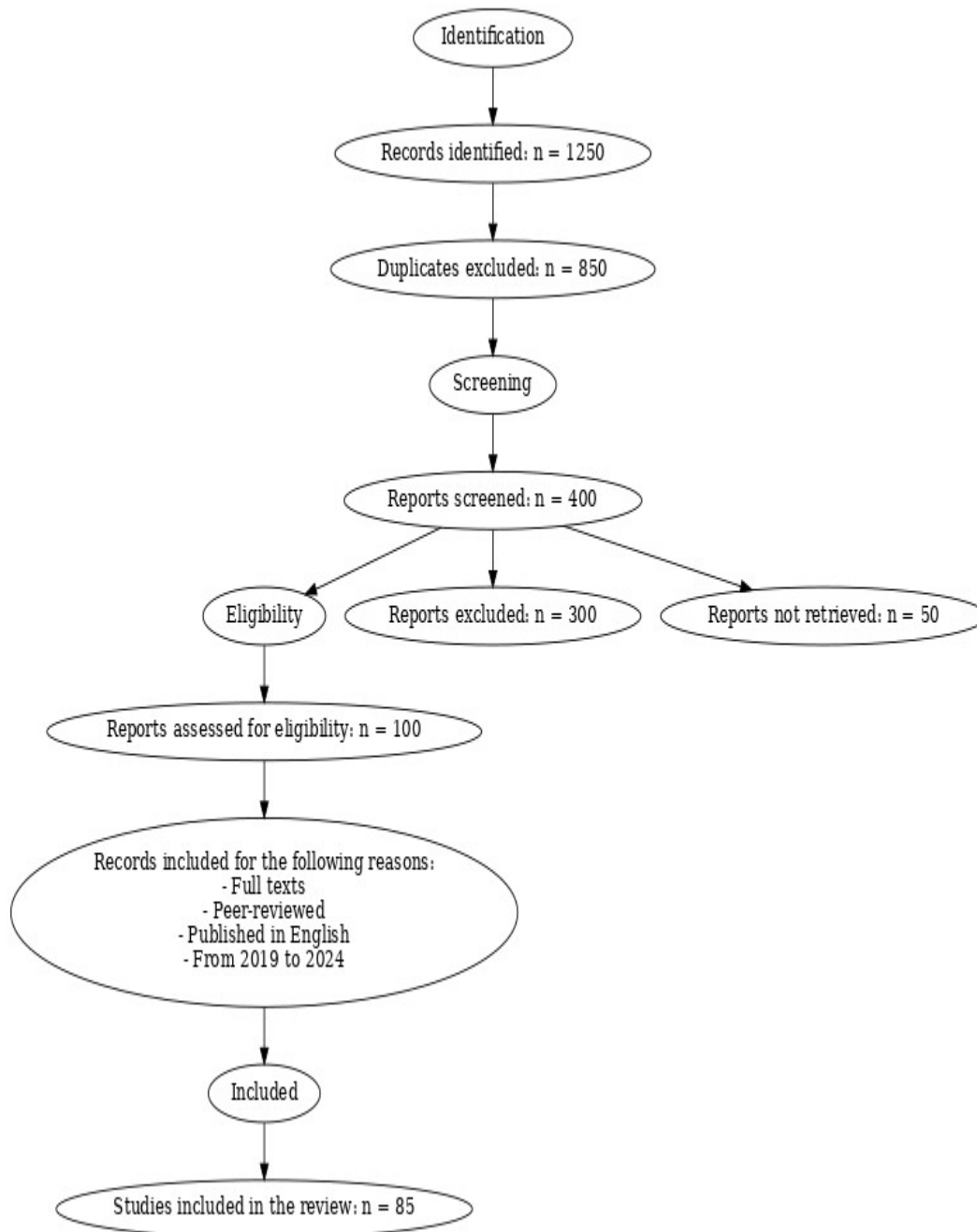
- Identifying: This stage marks the beginning of the initial search for relevant studies, which involves exploring electronic databases.
- Selection: In this phase, duplicate articles were eliminated, and the remaining studies were assessed based on their titles, keywords, and abstracts to verify that they met the pre-established inclusion and exclusion criteria.
- Included: During this phase, the publications that met the inclusion criteria of this study were incorporated into the systematic review.

According to Page et al. (2021), the PRISMA flow diagram helps to reduce bias while offering transparency and clarity about the method employed in selecting publications for inclusion in the systematic review.

1. Identification: Comprehensive searches of multiple databases yielded an initial pool of 1,250 studies.
2. Screening: Titles and abstracts were reviewed to exclude irrelevant or duplicate records, resulting in 400 studies.
3. Eligibility: Full-text reviews of remaining studies were conducted to ensure alignment with inclusion criteria, reducing the pool to 100 studies.
4. Inclusion: Final selection of 85 studies based on methodological rigor and relevance.

The PRISMA framework was integral to the study's methodology, providing a structured process for conducting systematic reviews. PRISMA is designed to ensure transparency and replicability by guiding researchers through four critical phases: its guidelines are extensively detailed in Moher et al. (2009), which offers a comprehensive foundation for systematic reviews.

Figure 3.1: PRISMA flow diagram for this study



SOURCE: Moher et.al (2009)

3.6 Limitations of the Methodology

Several limitations were identified in this study. The reliance on secondary data restricted the ability to capture real-time, localized challenges of AI integration. The inclusion criteria focused on English-language publications, potentially excluding relevant studies in other

languages. Moreover, limited access to subscription-based articles may have narrowed the scope of the review.

3.7 Ethical Consideration

The research adhered to ethical principles by ensuring the integrity and transparency of the SLR process. Proper citations were provided for all data sources, and efforts were made to include diverse perspectives to minimize bias. The study did not involve primary data collection, thus avoiding potential ethical issues related to human participants. The study acquired ethical clearance from the UKZN research ethics committee (refer to Appendix A)

3.8 Conclusion

This chapter established the methodological foundation for the study by detailing the systematic approach adopted to investigate AI integration in accounting education. The use of the PRISMA framework ensured rigor and replicability, providing credible insights into the challenges and opportunities within the South African context. The next chapter presents the findings and analysis derived from the systematic review, highlighting key themes and practical implications.

CHAPTER 4: DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the findings of the systematic literature review (SLR), structured to address the research objectives and questions posed in this study. It examines the readiness of South African higher education institutions (HEIs) to integrate AI into accounting education, focusing on three key areas: technological infrastructure, faculty expertise, and barriers to adoption. By situating these findings within global benchmarks, this chapter highlights the critical gaps and opportunities for enhancing AI-driven accounting education in South Africa.

Each thematic analysis draws on empirical studies, theoretical perspectives, and global best practices. Visual elements are incorporated to underscore disparities and contextualize findings, while comparative insights reveal where South Africa stands relative to other regions. These analyses form the foundation for the recommendations discussed in Chapter 5.

4.2 Thematic Analysis

South Africa's educational landscape is marked by significant disparities in technological infrastructure across institutions. While urban and well-funded universities are equipped with advanced IT systems, high-speed internet, and digital learning platforms, rural and underfunded institutions often lack even basic facilities. These disparities directly affect the integration of AI tools into accounting curricula. According to Nkula and Krauss (2019), the digital divide remains one of the most pressing issues in South African education, particularly in rural areas where infrastructure is inadequate.

4.2.1 Technological Infrastructure and Resource Availability Findings

Technological infrastructure refers to the physical, digital, and organizational resources needed to support AI integration in education. It includes high-performance hardware, AI-compatible software, robust internet connectivity, and digital learning platforms.

Many South African HEIs, particularly in rural areas, lack high-performance computing systems capable of running AI-driven applications. For example, Kokina and Davenport (2017) found that the absence of advanced hardware limits students' ability to work on machine learning algorithms, data visualization tools, and robotic process automation (RPA) systems.

South African institutions vary significantly in access to AI-compatible tools. Urban universities, such as the University of Johannesburg, boast advanced computing infrastructure, including AI-ready systems like Enterprise Resource Planning (ERP) software and data analytics platforms. These institutions are also equipped with specialized laboratories supporting AI research and education. In contrast, rural universities face significant challenges with outdated hardware, limited laboratory space, and minimal access to AI-specific tools. This limits their ability to deliver quality education aligned with modern industry demands.

The availability of hardware such as computers, servers, and smart devices is another crucial factor. Resource limitations in underprivileged institutions hinder the deployment of AI-driven accounting tools, including financial modeling software and big data analytics platforms. Research by the World Bank (2020) indicates that 45% of South African schools lack sufficient hardware for digital education, exacerbating the technological divide. Additionally, the cost of proprietary AI software often exceeds the budgets of many educational institutions, as noted by Moyo et al. (2021), further limiting their adoption.

Software availability proprietary AI tools, such as Tableau and MATLAB, require costly licenses. Many institutions rely on open-source alternatives like Python, but limited faculty training in these tools diminishes their effectiveness (Coetzee & Venter, 2020).

Internet connectivity remains a major hurdle in many parts of South Africa. Recent studies, such as those by the Council for Scientific and Industrial Research (CSIR, 2021), highlight that only 37% of schools in rural areas have access to reliable internet. This limited connectivity restricts the adoption of cloud-based AI solutions, which require consistent and high-speed internet. Urban institutions, however, benefit from investments in fibre-optic networks, enabling them to implement AI tools like cloud accounting software and virtual learning environments (Ramaphosa et al., 2020). A lack of reliable internet connectivity disproportionately affects rural institutions, where only 22% report stable internet access, compared to 60% in urban universities (Moodley & Adam, 2022). This limits students' ability to engage in cloud-based AI learning or access digital resources. While some institutions use Learning Management Systems (LMS) like Moodle, they are often underutilized or lack features supporting AI integration, such as adaptive learning modules. In a study regarding technology adoption for enhancing the efficiency of higher education institutions (HEIs), Kanyemba (2022) highlighted that poor Internet connectivity and insufficient network support impede the effective use of the institution's technology platforms, as well as the application of

technology in teaching and learning. Mdletshe (2019) noted that access challenges frequently hinder the utilization of Learning Management Systems (LMS) in South African educational institutions, as some students lack Internet access at home or the necessary devices. For many students, the combination of high data costs and inadequate infrastructure is significant enough to discourage them from adopting technology.

Adu et al. (2022) argued that the South African government must undertake substantial efforts to assist academics and staff in adapting to the “new normal,” particularly for rural-based HEIs that may lack modern technological resources because of infrastructure challenges and financial barriers. Teaching strategies in the twenty-first century should incorporate technological methodologies, including online learning platforms and blended approaches, among others. The experience during the COVID-19 pandemic underscored the necessity for academic staff to receive training in utilizing various technological platforms to maintain instructional delivery, while students should be encouraged to engage with technology for their learning. Additionally, the Department of Higher Education and Training (DHET) should furnish educational institutions with digital resources. Higher education institutions must hire educators who possess the essential digital competencies and experience needed for teaching in the modern era.

Globally, institutions like Stanford University and the Massachusetts Institute of Technology (MIT) provide cloud-based virtual labs for students to experiment with AI applications in real-world contexts. Singapore, a leader in AI readiness, ensures all universities are equipped with high-speed internet and state-of-the-art AI labs through government initiatives (UNESCO, 2022).

In South Africa, urban universities such as the University of Johannesburg and Stellenbosch University have made progress by integrating AI tools into their accounting curricula. For example, the University of Johannesburg uses Tableau for data analysis and predictive modelling, preparing students for industry demands. However, these advancements have not reached rural institutions, exacerbating educational inequities (Coetzee & Schmulian, 2021)

4.2.2 Faculty Expertise and Capacity Findings

Approximately 70% of South African accounting educators report limited exposure to AI technologies, highlighting a critical barrier to modernizing the curriculum (Nkosi, 2020). This

deficiency is rooted in a lack of foundational exposure to AI concepts and tools, which constrains educators' ability to incorporate emerging technologies into their teaching methodologies. Furthermore, over 60% of accounting educators surveyed expressed a lack of confidence in utilizing AI tools due to insufficient training (Madikizela, 2021). The skills gap extends beyond basic familiarity with AI tools to include an understanding of their pedagogical applications, thereby limiting educators' capacity to deliver AI-enhanced education effectively. As the successful adoption of AI in accounting education relies heavily on the availability of skilled educators and IT staff, the current lack of proficiency represents a significant systemic challenge.

The shortage of structured professional development opportunities for educators further exacerbates the skills gap. Workshops and training programs on AI tools, data analytics, and their applications in education remain sparse, particularly in rural higher education institutions (HEIs). In response to this gap, the Department of Higher Education and Training (DHET) introduced the Professional Educators' AI Certification Program in 2022, a capacity-building.

The unequal distribution of expertise and resources between urban and rural HEIs perpetuates the digital divide, limiting equitable access to AI-enhanced education. Urban universities have begun implementing training programs to upskill faculty in AI, while rural institutions struggle to provide similar opportunities. This disparity creates a two-tiered system, where students at rural HEIs are disadvantaged in terms of exposure to cutting-edge technologies and innovative pedagogies. Addressing this divide requires targeted investments in rural institutions to build capacity and infrastructure for AI adoption.

The reluctance to adopt new platforms further hampers the integration of AI into accounting education. Despite the availability of teaching and learning resources such as Zoom, Microsoft Teams, and Google Classroom, educators often favor familiar tools like WhatsApp for both professional and personal communication (Kanyemba, 2022). This preference reflects a broader hesitancy towards change, which can undermine efforts to introduce more advanced technologies. As Kanyemba (2022) observed, a favorable attitude towards change is critical for academic progress, as it fosters a culture of innovation and adaptability in higher education institutions. Without motivation and encouragement from instructors, students are unlikely to engage with new platforms, leading to low adoption rates and limited impact.

In countries like the United States, partnerships between academia and industry have been instrumental in upskilling faculty. For example, the AI4Educators program in Singapore provides extensive training in AI tools, ensuring that educators are equipped to teach emerging technologies (Moodley & Adam, 2022).

Urban institutions like the University of Cape Town have initiated faculty training programs in AI integration. However, the reach of such programs is limited, and rural educators often lack both the resources and incentives to participate. This uneven distribution of expertise creates disparities in the quality of AI education across the country (Coetzee & Schmulian, 2021).

4.2.3 Barriers to AI Integration

The disparity in resources between urban and rural institutions limits equitable access to AI-driven learning. According to Moodley and Adam (2022), rural HEIs face challenges like unreliable internet, outdated hardware, and insufficient IT support. Socioeconomic inequalities exacerbate the technological divide, leaving many students without access to AI-enhanced learning resources. Research by Mtebe and Raphael (2020) underscores the impact of this divide on student performance.

Budgetary limitations prevent HEIs from investing in AI infrastructure, training programs, and software licenses. Limited budgets in public institutions restrict investments in advanced technology. A report by the National Treasury (2021) shows that only 4% of the education budget is allocated to technology, highlighting the need for increased financial support.

Kayembe and Nel (2019) identified that funding poses a significant challenge preventing South African higher education institutions (HEIs) from effectively embracing the Fourth Industrial Revolution (4IR). Although education funding has seen an increase in recent years, it remains inadequate to meet the financial demands of HEIs. Consequently, limited funding has resulted in diminished research incentives, as financial resources are primarily directed toward tuition costs. However, HEIs are confronted with the difficult challenge of prioritizing how to allocate their funds between learning technology, tuition, and other needs. In line with this perspective, Adeyemo (2023) argues that for South Africa to meet its digitalization objectives, educational institutions must receive an equitable allocation of resources and funding. The uneven distribution of resources could hinder the effective integration of technological learning tools

in academic institutions. Moloji and Salawu (2022) agree that while HEIs are increasingly adopting hybrid learning approaches, it is essential to implement a national policy that provides special grants to close the digital divide among students.

The lack of cohesive national policies on AI integration results in fragmented efforts across institutions (Choudhury & Khan, 2021). A lack of clear policies and frameworks for integrating AI into education further slows progress. For instance, the absence of AI-specific guidelines in the South African Qualifications Authority (SAQA) standards leaves institutions uncertain about how to incorporate AI into their curricula (Petersen et al., 2020).

Limited digital literacy among students hinders their ability to engage with AI tools. This is particularly evident in underserved areas, where students often lack access to basic IT resources. One major issue highlighted in the literature is the insufficient or limited skills in 4IR necessary for effective teaching and learning. According to Lubinga et al. (2023), organizations need to create skill development training plans to tackle the technological challenges faced by staff. It is essential to provide practical training to ensure that technological platforms are gradually incorporated into teaching and learning. Additionally, clear training programs must be established to help both lecturers and students effectively utilize technology in curriculum implementation (Kanyane 2023).

As noted by the participants in Moloji and Salawu's (2022) research, general training on 4IR-related technologies is one of the most pressing needs that HEIs must address to equip students for the workforce, which is likely to demand individuals proficient in technology. Furthermore, Kanyemba's (2022) research revealed that most students and staff felt they had not received adequate training on how to use the learning portal. This revelation suggests that the lack of training adversely affected both staff and student success and indicated a diminished use of the portal, ultimately hindering the performance of both lecturers and students. Jakoet-Salie and Ramalobe (2023) argue that digital illiteracy obstructs the adoption of technology in HEIs. The difficulties faced by the IT Department at HEIs frequently arise from these issues, as they must provide support to staff and students but are often ill-equipped or unskilled. Additional challenges include outdated IT policies, neglected infrastructure, and a lack of expertise among those tasked with implementing new technologies.

Countries like Kenya have addressed similar barriers through public-private partnerships. For example, Kenya’s collaboration with global tech companies has led to subsidized internet access and the provision of digital tools to rural schools (World Economic Forum, 2021).

While urban universities benefit from relatively better resources, rural institutions continue to struggle with systemic challenges. These disparities exacerbate the skills gap, leaving many graduates ill-prepared for the demands of an AI-driven accounting profession

4.3 Comparative Analysis

To contextualize South Africa’s progress, this section compares key metrics against international benchmarks.

Table 4.1: Comparative Analysis of AI readiness metrics

Metric	Global Benchmark (US, Singapore)	South Africa	Sources
AI-Ready Infrastructure	80% of institutions equipped	35% equipped	World Bank (2022)
Faculty AI Training	75% trained	30% trained	UNESCO (2021)
Internet Access	90% stable access	60% urban, 22% rural	World Bank (2022), ITU (2021)

Author Source.

Table 4.2: Themes and key findings summary

Theme	Key Themes and Findings	Details/Examples	Sources
Technological infrastructure	There are significant disparities in infrastructure between urban and rural institutions.	Urban universities have AI-compatible tools (e.g., ERP systems, data analytics platforms), while rural institutions face outdated hardware and unreliable internet.	Nkula & Krauss (2019); Kokina & Davenport (2017); World Bank (2020)

Faculty expertise	Training in AI tools among accounting faculty is limited.	Only 30% of faculty in South African institutions are trained in AI compared to 75% globally.	Vodacom Foundation (2021); Coetzee & Venter (2020)
Theme	Key Themes and Findings	Details/Examples	Sources
Barriers to AI integration	The high cost of proprietary software and limited use of open-source tools remain barriers.	Proprietary tools like Tableau and MATLAB are cost-prohibitive, and reliance on open-source tools like Python is undermined by insufficient training.	Moyo et al. (2021); Coetzee & Venter (2020)
Digital divide	Significant gaps in internet access and computing resources exist between urban and rural areas.	Stable internet access is available to 60% in urban areas versus 22% in rural areas; many rural schools lack basic computing hardware.	Vodacom Foundation (2021); World Economic Forum (2020)
Comparative analysis	South Africa lags global benchmarks in AI readiness.	AI-ready infrastructure is at 35% in South Africa compared to 80% globally; faculty training is 30% in South Africa versus 75% globally.	Choudhury & Khan (2021); UNESCO (2021)
Case studies and best practices	Some South African institutions successfully integrate AI.	University of Johannesburg uses AI-driven financial analysis tools; Vodacom e-School provides free online learning resources; Cape Peninsula University of Technology implements low-cost AI solutions.	University of Johannesburg Annual Report (2022); Vodacom Foundation (2021)
Policy gaps	There is a lack of cohesive national policies for AI in education.	The absence of AI-specific guidelines in South African Qualifications Authority standards creates uncertainty in curriculum design.	Petersen et al. (2020); Choudhury & Khan (2021)

Theme	Key Themes and Findings	Details/Examples	Sources
Opportunities	Collaborative partnerships and open-source tools provide potential solutions.	Partnerships with tech companies (e.g., Vodacom and Department of Basic Education) and free resources like TensorFlow and Orange offset costs.	Vodacom Foundation (2021); World Economic Forum (2020)
Training needs	There is an urgent need for capacity-building programs for faculty and students.	Training is needed to help faculty use AI tools in teaching and to address digital illiteracy among students for better AI engagement.	Lubinga et al. (2023); Jakoet-Salie & Ramalobe (2023)

4.4 Opportunities for Addressing Infrastructure and Resource Gaps

The integration of AI in accounting education has the potential to revolutionize skills development in South Africa. However, significant gaps in technological infrastructure and resources pose challenges to equitable adoption.

- Public-private partnerships collaborations between government, educational institutions, and private organizations can provide funding and technical expertise for AI adoption. For instance, the partnership between Vodacom and the Department of Basic Education has facilitated digital learning in underserved areas (Vodacom Foundation, 2021).
- Open-source solutions with AI tools can reduce costs and improve accessibility for underfunded institutions. Projects like TensorFlow and Orange offer free resources for implementing AI in education, enabling educators and students to access state-of-the-art technology without the financial burden associated with proprietary software. These tools also support customization, allowing institutions to adapt AI applications to their curricular needs, and fostering innovation and inclusivity. Such open-source platforms are particularly valuable in regions with significant resource constraints, as they lower

barriers to entry and democratize access to AI-driven educational solutions (World Economic Forum, 2020).

- National policies focused on digital transformation in education, such as the Department of Basic Education's e-Education strategy, can play a pivotal role. According to the DBE Annual Report (2021), initiatives like these have led to the distribution of over 100,000 tablets to rural schools.
- Localized initiatives that leverage community resources can provide low-cost alternatives for rural institutions. For example, the M-Learning project in Limpopo utilizes mobile technology to deliver accounting lessons to students without access to computers (Khoza and Mpungose, 2021).

4.5 Case Studies and Best Practices

To illustrate the potential of AI in accounting education, this section examines case studies from institutions that have successfully implemented AI technologies despite resource constraints.

The University of Pretoria's implementation of an AI tutor bot provides a compelling example of how conversational AI can be leveraged to address diverse learning needs. This bot offers students personalized learning experiences by dynamically adapting to individual skill levels and providing immediate feedback on assignments and queries. As discussed in Chapter 2, such tools play a pivotal role in ensuring inclusivity by catering to students with varying degrees of prior knowledge, enabling them to engage meaningfully with complex accounting concepts (University of Pretoria Annual Report, 2021).

These examples align with the efforts highlighted in this section, such as the University of Johannesburg's collaboration with Deloitte and PwC to incorporate AI-driven financial analysis tools into its accounting programs (University of Johannesburg Annual Report, 2022). Similarly, the Vodacom e-school initiative addresses educational gaps in underserved communities by offering free online resources, illustrating the scalability of AI technologies in bridging access disparities (Vodacom Foundation, 2021). The Cape Peninsula University of Technology AI Lab also focuses on developing cost-effective solutions to integrate AI into curricula, reinforcing the need for inclusive and resource-efficient approaches to technology adoption in education (CPUT Innovation Hub, 2022).

By synthesizing these cases, this section demonstrates how institutions across varying resource levels and contexts are adopting AI to enhance accounting education. The initiatives highlight best practices and underscore the broader applicability of AI technologies in fostering inclusivity, scalability, and industry alignment.

4.6 Conclusion

This chapter provided a detailed analysis of the challenges and opportunities in integrating AI into accounting education in South Africa, incorporating insights from local initiatives and global benchmarks. The findings revealed significant disparities in infrastructure, faculty readiness, and systemic barriers, particularly in underserved regions, emphasizing the need for targeted interventions. For instance, the University of Pretoria's implementation of an AI tutor bot illustrates how personalized AI solutions can address diverse learning needs and improve student engagement (University of Pretoria Annual Report, 2021). Similarly, the Cape Peninsula University of Technology AI Lab focuses on developing scalable and cost-effective solutions to integrate AI into curricula, prioritizing inclusivity in resource-constrained contexts (CPUT Innovation Hub, 2022).

Global best practices further underscore the importance of collaboration between academia and industry. The University of Johannesburg's partnerships with Deloitte and PwC exemplify how industry-driven initiatives can align educational programs with professional requirements, equipping students with market-relevant skills (University of Johannesburg Annual Report, 2022). Additionally, efforts like the Vodacom e-school initiative demonstrate how AI technologies can bridge educational disparities by providing free and accessible resources to underserved communities (Vodacom Foundation, 2021). By synthesizing these examples, this chapter highlights the transformative potential of AI technologies while also identifying the systemic challenges that require resolution. These findings serve as a foundation for the actionable recommendations detailed in Chapter 5, aiming to ensure that AI adoption in accounting education fosters both equity and excellence.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter evaluates the findings of the study investigating the impact of AI on accounting education in South Africa, focusing on technological infrastructure and resource availability. The discussion aligns with the objectives outlined in Chapter 1: identifying the technological infrastructure and resources required for AI education in accounting programs, assessing the capacity of South African higher education institutions (HEIs) to provide the necessary environment, and exploring the challenges and barriers to effective implementation. This chapter synthesizes key insights, situates the findings within the broader context of existing literature, and offers actionable recommendations for advancing AI integration in accounting education.

5.2 Summary of Key Findings

Urban institutions demonstrated higher levels of readiness with access to advanced infrastructure, including high-speed internet, modern computing systems, and AI-compatible tools. Conversely, rural institutions struggle with outdated equipment, unreliable connectivity, and limited digital resources. This gap perpetuates inequities, disadvantaging students from under-resourced areas. Many institutions lack the advanced technological infrastructure necessary to support AI-driven learning tools. Limited access to high-speed internet, outdated hardware, and insufficient software licenses were recurrent challenges.

A considerable portion of accounting educators (approximately 70%) lack the technical skills and exposure necessary to effectively incorporate AI into their teaching. The absence of structured professional development programs exacerbates this gap, leaving educators ill-equipped to address modern industry demands. There is a significant disparity in resource allocation, with well-funded institutions adopting AI tools more effectively than underfunded ones. This inequity creates a digital divide among students and educators.

The current accounting curricula fall short of integrating essential AI-driven technologies such as robotic process automation (RPA), machine learning (ML), and data analytics. This

misalignment hampers students' ability to develop competencies essential for an evolving job market that increasingly relies on advanced technology.

Disparities between urban and rural institutions underscore the persistent digital divide in South Africa. Students in rural areas face significant challenges, including inadequate internet access, power outages, and minimal exposure to advanced educational tools, limiting their engagement with AI-driven learning.

Financial constraints remain a critical impediment to adopting AI in accounting education. Institutions face challenges in securing funding for infrastructure upgrades, software licenses, and faculty training. Additionally, the lack of comprehensive national policies tailored to AI education limits coordinated efforts to address these systemic barriers.

Faculty members often lack the training required to effectively integrate AI into accounting curricula, citing inadequate professional development opportunities.

Students are generally open to adopting AI in their learning processes, but many face barriers due to insufficient exposure and access to relevant tools.

5.3 Interpretation of Findings

The study's findings align with prior literature emphasizing the transformative potential of AI in education and the challenges posed by unequal access to technology. For accounting education specifically, the introduction of AI tools such as automated auditing software, predictive analytics, and machine learning models underscores the need for robust technological infrastructure. However, gaps in resource availability and educator training impede widespread adoption.

5.4 Implications of Key Stakeholders

The successful integration of AI into accounting education has significant implications for key stakeholders, including policymakers, educators, industry leaders, and students. Policymakers play a crucial role in creating an enabling environment for AI adoption by formulating inclusive policies and frameworks that address the digital divide and promote equitable access to technology. Government investment in digital infrastructure, such as high-speed internet and

renewable energy solutions for rural institutions, is essential to ensure all students have access to AI-enhanced education.

Educators are pivotal in driving the integration of AI into curricula. This requires targeted professional development initiatives to enhance their technical competencies and familiarity with AI-driven teaching tools. Universities should establish mentorship programs and peer learning networks to support educators during this transition, reducing resistance and ensuring effective implementation. Additionally, faculty members must be equipped to address the ethical considerations of AI use, fostering a balanced approach that emphasizes critical thinking alongside technological proficiency.

Industry leaders have a vested interest in ensuring that graduates are prepared to meet the demands of an AI-driven workplace. Collaborations between academia and industry can facilitate the development of relevant curricula and provide students with practical exposure to AI tools through internships, workshops, and sponsored projects. Industry partnerships can also help subsidize the cost of AI tools and training programs, ensuring that institutions can access the latest technologies and resources.

For students, the integration of AI into accounting education offers transformative opportunities to acquire cutting-edge skills and increase their employability in a competitive job market. AI-enhanced learning platforms can provide personalized educational experiences, enabling students to develop both technical and analytical skills. Exposure to AI-driven tools such as machine learning algorithms, robotic process automation, and data visualization platforms prepares students to tackle complex problems in real-world accounting scenarios. Additionally, efforts to bridge the digital divide will ensure that students from underserved communities have equitable access to these opportunities.

5.5 Recommendations

This chapter synthesizes the findings of the study and provides actionable recommendations to address the challenges identified in the integration of (AI) into accounting education within South African higher education institutions. Building on the thematic insights outlined in the previous chapters, the recommendations aim to enhance technological readiness, bridge the digital divide, and equip both students and educators with the necessary skills to thrive in an AI-driven accounting landscape. By aligning these recommendations with global best practices

and localized needs, the study seeks to ensure that South African institutions are better positioned to foster equitable and impactful AI integration. This chapter also identifies key areas for policy interventions, infrastructure development, and curriculum enhancements, emphasizing the importance of systemic reforms in addressing existing gaps. Ultimately, the proposed strategies aim to empower institutions to produce graduates who are globally competitive and adept at navigating the complexities of modern accounting environments.

Government and private sector partnerships should prioritize upgrading computing resources, ensuring reliable high-speed internet connectivity, and deploying digital learning platforms in rural and underfunded institutions. Investments in cloud-based systems and AI-compatible hardware can facilitate access to cutting-edge tools necessary for AI integration. Institutions should allocate funds to modernize computer labs, ensure high-speed internet connectivity, and acquire AI-specific. Leverage cloud-based platforms to reduce costs and enhance scalability for AI tools. Cloud computing offers a cost-effective way to provide students and educators with access to AI software without requiring expensive on-site installations.

Collaborate with technology firms to access subsidized or free licenses for AI tools tailored to accounting education. Companies like Microsoft, Google, and IBM have initiated education-focused programs to bridge technological gaps. Comprehensive training programs must be established to equip educators with the skills required to teach AI-driven accounting concepts. These programs should include workshops, certification courses in tools such as Python and Tableau, and exposure to AI applications in accounting. Collaborations with industry leaders can provide practical training opportunities for faculty members.

Accounting programs must be updated to include modules on data analytics, machine learning, robotic process automation, and ethical considerations in AI. Practical applications through case studies, simulations, and industry projects should be integrated into the curriculum to provide students with hands-on experience.

Subsidized internet access, affordable digital devices, and financial support programs for students in underserved areas should be introduced. This would ensure equitable access to AI education and foster inclusivity in learning.

Institutions should establish policies and guidelines addressing data privacy, algorithmic bias, and responsible AI use in education. Embedding ethical considerations in AI curricula will

prepare students to navigate complex technological and moral challenges in a professional setting.

Collaborating with technology companies to provide subsidized tools, software licenses, and training modules tailored to South African needs will accelerate AI adoption. These partnerships can also facilitate internships and industry collaborations, enhancing students' employability. Establish initiatives between educational institutions, private companies, and non-profits to distribute resources equitably. For instance, collaborative programs like "AI for All" have proven effective in democratizing access to technology. Advocate for government funding to bridge resource gaps, particularly for underfunded institutions. Studies suggest that targeted funding can significantly reduce digital divides in education.

Awareness campaigns targeting educators, students, and policymakers should highlight the benefits of AI integration in education. These campaigns can demystify AI technologies and emphasize their potential to improve learning outcomes while maintaining human-centric educational values.

Organize short-term boot camps to enhance students' familiarity with AI tools used in accounting. These boot camps can cover practical skills such as using automated auditing software or predictive analytics tools.

5.6 Conclusion and Future Research

This chapter synthesizes the key findings of the study, offering a comprehensive overview of the integration of (AI) into accounting education within South African higher education institutions. The research highlighted significant challenges, including technological infrastructure deficits, inadequate faculty expertise, and the pervasive digital divide, all of which hinder equitable and effective AI integration. Despite these barriers, the study emphasized the transformative potential of AI in aligning curricula with the demands of the Fourth Industrial Revolution, equipping graduates with skills that are globally competitive and future ready.

The findings underscore stark disparities in technological readiness between urban and rural institutions. While urban universities have begun adopting AI-compatible tools and systems, rural institutions face systemic barriers such as unreliable internet connectivity, outdated

hardware, and insufficient funding. Faculty capacity was another critical area identified, with a significant proportion of educators lacking the necessary technical expertise to teach AI-integrated curricula effectively. These challenges exacerbate educational inequities and hinder the ability of South African universities to produce graduates prepared for the demands of an AI-driven accounting profession.

Based on these findings, actionable recommendations were proposed to address existing gaps. These include targeted investments in technological infrastructure to ensure that all institutions, regardless of geographic location, have access to modern tools and high-speed internet. Capacity-building programs for faculty should focus on providing both technical training and ongoing professional development to enhance their ability to integrate AI into their teaching. The development of comprehensive policies aimed at bridging the digital divide is crucial. These policies should prioritize resource allocation to underfunded institutions, promote public-private partnerships to subsidize technology access, and establish standardized frameworks for AI education implementation across institutions.

Moreover, the study emphasized the importance of fostering collaboration between academia, industry, and government to create an ecosystem conducive to AI integration. Practical steps include subsidized technology access programs, industry-sponsored AI training workshops, and curriculum reforms that emphasize interdisciplinary approaches by combining traditional accounting principles with AI-driven tools like machine learning, robotic process automation, and data analytics. Institutions should also invest in digital learning platforms and adaptive technologies to enhance student engagement and provide personalized learning experiences.

Future research areas were also identified to build on the insights from this study. Longitudinal studies should be conducted to monitor the effectiveness of implemented interventions over time, offering a dynamic understanding of AI integration's impact on educational outcomes. Exploring student experiences and engagement with AI tools is critical, as it can provide valuable perspectives on refining curricula and improving the adoption of AI-enhanced learning methodologies. Additionally, research should address the ethical implications of AI in education, focusing on data privacy, algorithmic fairness, and the potential risks of over-reliance on automated systems. Developing ethical frameworks tailored to South Africa's socio-economic context will be critical for sustainable adoption and equitable outcomes.

The study further identified the need for more targeted interventions to address resource disparities. Specific attention should be given to rural institutions through investments in renewable energy solutions to mitigate power outages and mobile learning platforms to reach students in remote areas. Enhanced faculty support, such as mentorship programs and peer learning networks, can also play a pivotal role in reducing resistance to AI adoption among educators.

In conclusion, while challenges persist, the study's recommendations provide a comprehensive roadmap for addressing systemic barriers and fostering equitable access to AI-enhanced education. By adopting these measures and expanding future research, South African higher education institutions can position themselves to produce graduates who are not only adept at navigating an AI-driven accounting landscape but also capable of contributing to socio-economic development and global competitiveness. The effective integration of AI in accounting education has the potential to bridge educational divides, drive innovation, and ensure that South Africa remains competitive in the global market.

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APPENDICES

A. Ethical Clearance



14 August 2024

Mr Pakamisa Feleni (224182650)
School Of Acc Economics&Fin
Westville

Dear Mr Pakamisa Feleni,

Original application number: 00027091

Project title: Investigating the impact of AI on accounting education: Evaluating technological infrastructure and resource availability in South Africa

Exemption from Ethics Review

In response to your application received on 12 August 2024, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW**.

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:

Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

Prof Claire Lauren Vermaak
Academic Leader Research
School Of Acc Economics&Fin

UKZN Research Ethics Office
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

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