

Chapter # 15

INTEGRATING ADVANCED TECHNOLOGY FOR PEDAGOGICAL ENHANCEMENT IN GRADE 10 ACCOUNTING INSTRUCTION: A SOUTH AFRICAN VIEWPOINT

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ABSTRACT

The study investigated the integration of technology into Grade 10 accounting instruction, examining how teachers adapted their methodologies to incorporate various technological tools, such as online platforms and interactive software, following the COVID-19 pandemic. A qualitative research approach was employed. The study adopted a constructivist learning theory. A purposive sample of 15 accounting teachers from five schools in the OR Tambo Coastal region was utilised. Data were collected through in-depth interviews. The data was analysed using thematic analysis. The study concluded that while technology integration offered significant benefits for educational outcomes in accounting, it also revealed challenges that require comprehensive training programs and strategic investments in resources. Future research could investigate the long-term effects of technology integration on learner performance and identify effective practices for teacher professional development. The study recommended ongoing professional development programs tailored for accounting teachers, prioritising resource allocation for technology access, and establishing collaborative learning communities among teachers. Additionally, training programs were developed to enhance learners' technological skills. Updating the curriculum to emphasise digital literacy and creating robust support systems for technical issues were essential.

Keywords: technology integration, blended learning, teacher training, learner engagement, accounting education.

1. INTRODUCTION

The integration of technology in teaching Grade 10 accounting has gained significant importance, especially in the wake of the COVID-19 pandemic, which necessitated a rapid shift from traditional classroom settings to online learning environments (Agustina & Setiawan, 2020; Ahshan, 2021). Accounting is an essential subject that equips learners with foundational skills and knowledge critical for navigating the business world, including understanding financial transactions, preparing financial statements, and applying accounting principles. The pandemic's disruption accelerated the adoption of technological tools by teachers to maintain educational standards and engage learners effectively in remote or hybrid settings (Ahshan, 2021; Haleem, Javaid, Qadri, & Suman, 2022). Before the pandemic, accounting education largely depended on face-to-face instruction and manual methods of bookkeeping and analysis. However, with the sudden need for remote learning, teachers turned to a variety of online platforms, interactive software, and digital resources to support teaching and learning processes. Tools such as spreadsheet software (e.g., Microsoft Excel), accounting software packages, and virtual classrooms became integral to lessons,

enabling learners to practice real-world accounting skills in a virtual format (Haleem et al., 2022; Technology-Integrated Lesson Plan, 2025). For instance, teachers introduced learners to spreadsheet functions to organise, analyse, and present financial data, therefore reinforcing both theoretical concepts and practical competencies in a digital context. Incorporation of technology extends beyond mere replacement of physical classrooms with online platforms; it transforms pedagogical strategies to enhance learning. Teachers employ varied approaches, including interactive lectures supplemented by digital demonstrations, group collaborations through virtual meeting tools, and hands-on exercises using accounting software, fostering an active and engaging learning environment despite physical separation (Teacher's Guide for Grade 10 Accounting, 2025). Technology also enables timely feedback and assessment, allowing teachers to track progress and address learning gaps more efficiently.

The following research question guided the study:

1. What teaching approaches were employed by teachers to incorporate technology in instructing Grade 10 Accounting learners?

2. BACKGROUND OF THE STUDY

The integration of advanced technology in teaching Grade 10 accounting has become increasingly critical within the South African education system, especially following the disruptions caused by the COVID-19 pandemic (Skhephe, 2022). Traditionally, accounting education relied heavily on face-to-face instruction and manual bookkeeping methods, but the rapid shift to remote and blended learning environments necessitated the adoption of various technological tools (Sangster, Stoner, & Flood, 2020). These include online platforms, interactive software, spreadsheet programs such as Microsoft Excel, and accounting applications that enable learners to engage with real-world accounting tasks digitally (Agustina & Setiawan, 2020; Haleem et al., 2022). In South Africa, particularly in regions such as the OR Tambo Coastal area, teachers have adapted their pedagogical approaches to incorporate technology, fostering more active, learner-centred environments aligned with constructivist theory. Such strategies promote critical thinking and enhance learner engagement, even in the face of physical separation (Banihashem et al., 2022; Teacher's Guide for Grade 10 Accounting, 2025).

However, the integration process is challenged by systemic barriers, including inadequate teacher training, limited access to reliable technological resources, and disparities in learners' technological proficiency and access (Msomi et al., 2025; Starkey, 2020). Moreover, the accounting curriculum has expanded to include complex topics that require both conceptual and technological mastery, adding cognitive demands on learners (Msomi et al., 2025). Despite obstacles, effective technology integration supports continuity of instruction and enriches educational experiences, equipping learners with the essential digital literacy skills required for the evolving accounting profession, which increasingly relies on automated systems and data analytics (Agustina & Setiawan, 2020; Haleem et al., 2022). The study, therefore, examines how Grade 10 accounting teachers in the OR Tambo Coastal region pedagogically interpret and utilise advanced technology to enhance teaching and learning, aiming to identify effective strategies and address existing challenges within the South African context.

3. LITERATURE REVIEW

Recent studies have highlighted the transformative impact of technology in education, particularly in enhancing learner engagement and critical thinking, while improving access to learning materials (Okolie et al., 2022). Innovative methods such as project-based learning and flipped classrooms have gained traction, promoting active learner participation (Nkomo, Daniel, & Butson, 2021). However, many teachers continue to rely on traditional teaching methods, indicating a need for effective training programs to facilitate the integration of technology in a meaningful way. In Grade 10 accounting, the use of technology has become increasingly important since the COVID-19 pandemic, yet its implementation remains inconsistent (Sangster, Stoner, & Flood, 2020). Teachers often struggle with modern technology despite acknowledging its significance for future job preparation. Addressing challenges such as technical issues, limited resources, and gaps in learner technical skills is crucial for successful integration (Onyema, 2020). The existing literature offers a comprehensive examination of the benefits and challenges of integrating technology in Grade 10 accounting education, highlighting the issues faced by both teachers and learners. However, there is a notable gap in studies that specifically examine the interconnected effects of teacher preparedness, learner digital literacy, and infrastructural disparities within the South African context, particularly in the post-COVID-19 era (Sangster, Stoner, & Flood, 2020). Furthermore, while prior research identifies challenges and suggests broad strategies, few studies offer detailed, context-specific interventions tailored to Grade 10 accounting teachers and learners that address these multifaceted barriers holistically (Onyema, 2020). The study aims to fill these gaps by investigating how targeted professional development and resource support could enhance technology use and learning outcomes in this area.

3.1. Challenges Faced by Teachers in Using Advanced Technology to Teach Grade 10 Accounting

Research underlined the transformative role of technology in education, emphasising its capacity to enhance learner engagement, foster critical thinking, and improve access to diverse learning resources (Nkomo et al., 2021). Technological tools create dynamic learning environments that move beyond passive reception of information, encouraging learners to actively participate and apply their knowledge (Laine & Nygren, 2016). Among the innovative instructional methods gaining traction are project-based learning and flipped classrooms, which rely heavily on technology to facilitate active learner participation and deeper learning (Rothwell, 2020). Project-based learning enables learners to explore real-world problems, often utilising digital tools to research, collaborate, and present their findings, thereby connecting theory to practice. Flipped classrooms invert traditional teaching by delivering instructional content online outside of class, freeing up in-person time for interactive problem-solving and discussion, which enhances learner engagement and mastery of material (Heiss & Oxley, 2021). Despite these promising developments, many teachers continue to rely on traditional teaching approaches that may not fully leverage the potential of technology to transform learning. This adherence highlights a pressing need for effective and ongoing training programs aimed at empowering teachers with the necessary skills and confidence to integrate technology meaningfully into their pedagogy (Fobert, 2024). Technology integration is not merely about using digital devices; it requires a pedagogical shift that aligns teaching methods with modern technological affordances to support varied learning styles and promote critical competencies in learners (Thelma, Sain, Mpolomoka, Akpan, & Davy, 2024).

The pandemic accelerated the shift from conventional classrooms to virtual and blended learning environments, necessitating the adoption of various technological tools to maintain instructional continuity and quality (Anthony Jnr & Noel, 2021). However, the implementation of technology in Grade 10 accounting classrooms remains inconsistent. While some schools and teachers successfully incorporate digital resources such as accounting software, spreadsheets, and online assessment platforms, others struggle due to limited access or insufficient technical expertise. Teachers often face several barriers in utilising modern technology effectively. For example, many teachers confront challenges such as a lack of access to up-to-date devices, unreliable internet connectivity, and insufficient training on how to integrate these tools within accounting curricula to enhance learning outcomes (Nkomo et al., 2021; Insights from a South African University of Technology, 2025).

Moreover, technical issues during lessons, such as software malfunctions or platform usability problems, could disrupt teaching and diminish the benefits technology could offer (Reich, 2020). The challenges underline a critical need for robust teacher training and ongoing technical support, focusing not only on familiarisation with technological tools but also on pedagogical strategies for their effective use. Inequitable access to technology creates a digital divide that affects both teachers' capacity to deliver instruction and learners' opportunities to learn effectively with digital tools. This issue affects the consistency of technology integration in Grade 10 accounting education, leading to uneven learner experiences and potential gaps in acquiring the crucial digital literacy and accounting skills necessary for future academic and career success (Eloff, 2016). Addressing these challenges requires a multifaceted intervention. Professional development programs tailored specifically for accounting teachers may incorporate hands-on training in relevant software, digital pedagogies, and troubleshooting common technical issues (Nkomo & Ndovela, 2025). Moreover, schools and educational authorities may invest in infrastructure improvements, such as reliable internet access and updated hardware, to support seamless technology use. Encouraging collaboration among teachers through professional learning communities could also facilitate the sharing of best practices and innovative strategies, fostering a culture of continuous improvement in technology integration (Antinluoma, Ilomäki, & Toom, 2021).

3.2. Challenges Faced by Grade 10 Learners in Learning Accounting using Advanced Technology

Grade 10 learners encounter several significant challenges when utilising advanced technology to learn accounting, which could substantially hinder their acquisition and understanding of key accounting concepts (Sangster, Stoner, & Flood, 2020).

3.2.1. Skills Deficit and Technical Complexity

One of the foremost issues is the gap in technical skills among learners. Many learners lack the necessary competencies to navigate and operate advanced accounting software, which is often complex and requires familiarity with various digital functions (Lajnef, 2025). The skills deficit frequently leads to frustration, anxiety, and disengagement, as learners struggle to keep pace with instructional demands that assume a higher baseline of technological proficiency. In many schools, particularly in rural or under-resourced areas, learners lack consistent access to computers, tablets, or reliable internet connections, which are essential for utilising sophisticated digital accounting tools (Msomi et al., 2025). The complexity of advanced accounting software itself presents another substantial barrier. For beginners, the steep learning curve required to understand features, menus, formulas, and functions could be overwhelming (Rothwell, 2020). Many learners encounter challenges in

mastering the software's interface and applying it to theoretical accounting principles, which may lead to decreased participation and lower motivation. This difficulty is compounded in cases where learners lack sufficient guided practice or where lesson pacing does not adequately account for the time required to master technological tools. Without appropriate scaffolding, learners may struggle to connect practical software tasks with underlying accounting concepts, which could negatively affect knowledge retention and application (Reiser, 2018).

3.2.2. Learner Attitudes and Anxiety

Learners' attitudes toward technology could also play a critical role in these challenges. Some learners may resist using technology either due to discomfort with change or a preference for traditional, pen-and-paper methods of learning. This resistance could stem from unfamiliarity with digital devices, fear of making errors in software, or an attachment to conventional teaching styles that they perceive as more straightforward or effective (Nkomo et al., 2021). Such attitudes diminish enthusiasm and openness to technology-rich learning environments, creating further hurdles for teachers seeking to integrate digital tools effectively. Furthermore, learners who experience anxiety or self-doubt when confronted with technology are less likely to engage fully or experiment with new software, limiting their opportunities to build proficiency.

3.2.3. Teacher Support and Preparedness

Moreover, a lack of adequate teacher support significantly exacerbates these challenges. Many teachers themselves feel insufficiently prepared or confident in their own ICT skills to effectively guide learners through the use of advanced accounting software (Msomi et al., 2025). Insufficient professional development and access to ongoing training leave teachers struggling to troubleshoot technological issues, deliver lessons that effectively incorporate digital tools, and provide timely assistance to learners encountering difficulties (Ferri, Grifoni, & Guzzo, 2020). This lack of support could result in ineffective technology integration, with teachers reverting to traditional methods to compensate, which further limits learners' exposure to technology-enhanced accounting education. Without teacher confidence and competence in technology, the potential benefits of digital learning tools remain underutilised, and learners' learning is compromised (Mhlongo, Mbatha, Ramatsetse, & Dlamini, 2023).

3.2.4. Infrastructure and Resource Scarcity

Many schools lack sufficient technological infrastructure, including up-to-date computers, software licenses, and stable internet connectivity. Overcrowded classrooms and a high learner-to-device ratio mean learners may share limited technology resources, reducing the time for individual practice that is essential for mastering complex software (Msomi et al., 2025). The COVID-19 pandemic has further highlighted these disparities, as remote and hybrid learning models require a greater reliance on technology, thereby amplifying inequities where inadequate infrastructure exists. This scarcity impedes regular and meaningful engagement with technology, which is crucial for learners to develop confidence and competence in digital accounting tools (Lajnef, 2025).

3.2.5. Language and Curriculum Complexities

Language and curriculum complexities interplay closely with technological challenges. For instance, accounting terminology and instructions are often delivered in English, which may not be the first language for many learners, complicating both comprehension and use

of software interfaces (Msomi et al., 2025). The technical language used in accounting software and educational materials could be daunting, making it difficult for learners to fully grasp instructional content or navigate digital platforms effectively (Lajnef, 2025). Additionally, the curriculum has expanded to include more sophisticated topics, such as auditing, internal controls, and financial analysis, which require a deeper conceptual understanding complemented by technological proficiency. Without adequate scaffolding, learners could feel overwhelmed by the simultaneous demands of mastering both complex content and technology, increasing cognitive load and reducing learning efficiency (Sweller, 2020).

3.2.6. Comprehensive Strategies for Addressing Learner Challenges

Addressing these multifaceted challenges requires a comprehensive and strategic approach. First, enhanced and continuous training programs for both learners and teachers are crucial (Petar, 2024). For learners, targeted digital literacy programs that focus on basic to intermediate ICT skills and software-specific training may help bridge the technical skills gap and reduce frustration (Ben Youssef, Dahmani, & Ragni, 2022). These programs could use incremental skill-building exercises that gradually introduce learners to software functionalities in manageable steps. For teachers, professional development could emphasise technological pedagogical content knowledge, combining subject mastery with effective technology use and ongoing technical support to build confidence and competence (Msomi et al., 2025; Nkomo et al., 2021). This empowerment enables teachers to confidently implement technology-enhanced accounting instruction, troubleshoot technical issues promptly, and provide effective support to learners.

4. THEORETICAL FRAMEWORK

The study adopted constructivist learning theory, which posits that learners learn most effectively through active engagement and personal experience (Banihashem et al., 2022). Within the framework, learners were encouraged to utilise technology to understand and apply accounting concepts rather than passively receive information. Tools such as interactive simulations and accounting software facilitate practice in real-world scenarios. Learner-centred pedagogy emphasises active learner participation, enabling teachers to create collaborative environments where learners may ask questions and solve problems together (Banihashem et al., 2022). Techniques such as flipped classrooms and project-based learning further promote engagement and critical thinking. To effectively integrate technology, teachers could employ models that evaluate technology use in lessons. Collaborative learning through online tools enhances understanding while developing essential workplace skills. Addressing challenges such as technical issues and inadequate teacher training is crucial for the successful implementation of this initiative.

5. METHODS

5.1. Research Approach

The study, titled "Pedagogical Interpretation in Teaching Grade 10 Accounting Using Advanced Technology," employed a qualitative research approach to investigate how teachers interpret and utilise advanced technology in their instruction (Chong & Reinders, 2020). A case study design focuses on specific teachers and their methods, allowing for an in-depth examination of technology integration in accounting lessons. An interpretive approach was used to understand the meanings attributed to experiences with technology,

understanding how both teachers and learners engaged with advanced tools in accounting education. Ethical guidelines were strictly adhered to, including obtaining informed consent from participants and ensuring confidentiality. The study acknowledges potential limitations, such as a small participant pool that may affect generalizability (Chong & Reinders, 2020). Nevertheless, the approach aims to provide valuable insights into teaching practices in Grade 10 accounting by utilising advanced technology.

5.2. Population and Sampling

For the qualitative study on integrating advanced technology in teaching Grade 10 accounting, the population consisted of 15 accounting teachers from various schools within the OR Tambo Coastal region that had incorporated technology into their lessons (Zamokuhle, Zikhona, & Ngqunguza, 2025). The group was crucial as they directly experienced the impacts of technology on teaching and learning processes. The sample size was limited to facilitate in-depth insights into their experiences, providing a diverse range of perspectives on how they utilised technology in their classrooms. The sample size was suitable for qualitative research, emphasising a deep understanding of experiences and opinions. By gathering data completely from teachers, the study uncovered effective strategies for technology use in accounting education while identifying the challenges they encountered (Handoyo, 2024). The focused approach enhanced teaching methodologies, ensuring that teachers were equipped to prepare learners with the necessary skills for careers in accounting.

5.3. Data Collection

Interviews were employed as the primary data collection method in the study, specifically through semi-structured interviews with Grade 10 accounting teachers (Mkhize, Mtshali, & Ntombela, 2023). The approach involved posing open-ended questions that enabled teachers to articulate their thoughts, experiences, challenges, and strategies regarding the use of technology in their instruction (Braun & Clarke, 2021). Such a method facilitated a deeper understanding of how teachers integrate technology into their teaching practices and the various factors influencing their experiences. Interviews lasted between 30 and 45 minutes, allowing sufficient time to explore participants' experiences in depth. Data saturation was determined when no new themes or insights emerged from successive interviews, indicating sufficient coverage of the research topics.

5.4. Data Analysis

The study employed thematic analysis to identify patterns and themes within the collected data (Braun & Clarke, 2021). The process involved systematically organising information obtained from interviews, focus groups, observations, and documents to highlight key insights regarding the use of technology in the teaching of Grade 10 accounting (Mkhize, Mtshali, & Ntombela, 2023). By analysing the data thematically, the research aimed to uncover significant trends and understand how technology is integrated into instructional practices.

6. FINDINGS

Figure 1.
Traditional vs. Modern Pedagogies in Accounting Education.

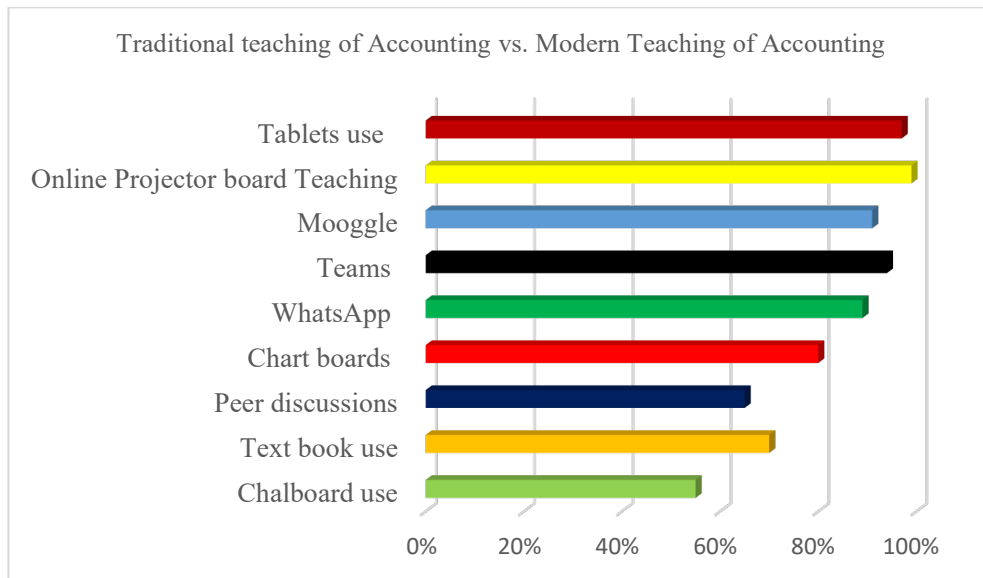


Figure 1 shows usage rates: chalkboards 55%, textbooks 70%, peer discussions 65%, chart boards 80%, WhatsApp 89%, Teams 94%, Mooggle 91%, tablets 97%, online projectors 99%.

Figure 2.
Pedagogical Challenges in Accounting.

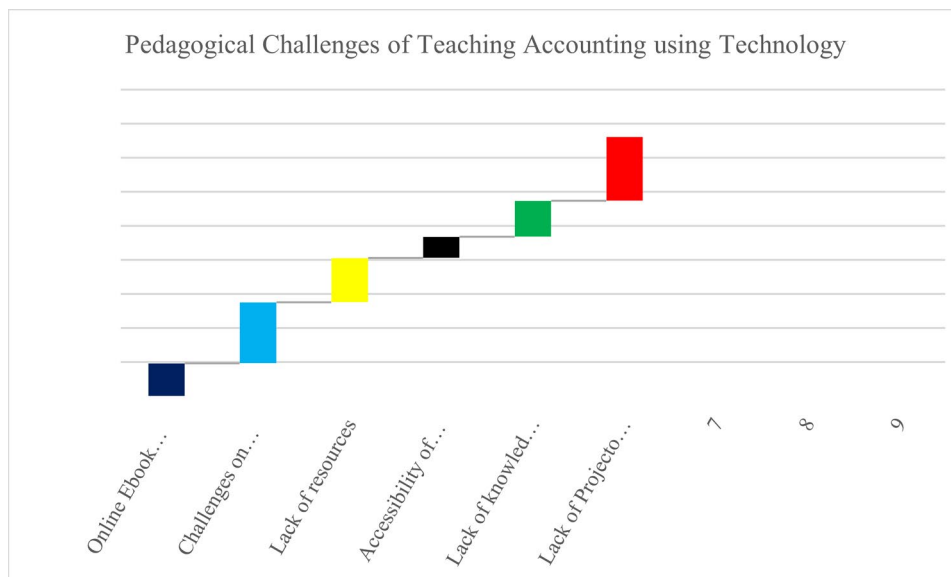


Figure 2 illustrates the challenges of pedagogy in teaching accounting with technology, highlighting issues such as teacher preparedness, resource limitations, and varying learner readiness that hinder effective integration of technology.

Figure 3.
Effective Accounting Teaching Strategies.

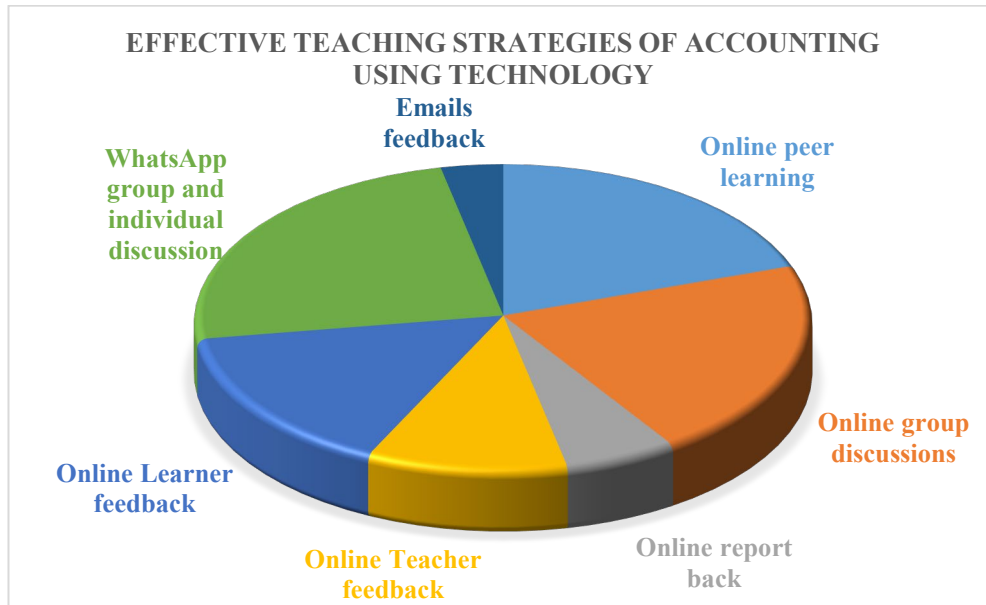


Figure 3 shows effective accounting teaching strategies: Email feedback 13%, WhatsApp discussions 94%, online learner feedback 60%, teacher feedback 41%, report back 23%, group discussions 82%, and peer learning 77%.

7. DISCUSSIONS

The data revealed varying degrees of technology integration in accounting education, with significant preferences for digital tools (Onyema, 2020). Online Projector Board Teaching was the most utilised method at 99%, followed by Tablets at 97% and Microsoft Teams at 94% (Das, 2024). However, traditional methods such as chalkboards (55%) and textbooks (70%) remained common, indicating resistance to digital transformation (Oyinloye, 2022). The findings highlighted critical gaps in resources, teacher preparedness, and technological accessibility (Starkey, 2020). 94% of schools lacked projector boards, limiting teachers' ability to present complex concepts effectively. Approximately 53% of teachers reported insufficient knowledge of online teaching methodologies, emphasising the need for professional development (Sangster, Stoner, & Flood, 2020). Connectivity issues further complicated the landscape, with 90% of teachers experiencing online connectivity challenges. Effective teaching strategies emerged, with WhatsApp groups and individual discussions favoured by 94% of participants (Nkomo, Daniel, & Butson, 2021). The high WhatsApp adoption rate in low-resource settings suggests that appropriate technology strategies could prioritise accessibility, low data consumption, and usability on widely available mobile devices. WhatsApp's popularity in regions such as Africa, where it accounts

for a significant portion of mobile internet use, highlights how technologies that operate efficiently with limited infrastructure and offer offline-friendly features could be highly effective. This suggests that digital education or communication interventions in low-resource contexts may leverage inexpensive, familiar, and easy-to-use platforms, such as WhatsApp, to maximise reach and engagement. The platform's success also demonstrates the value of integrating multimedia communication and facilitating quick, real-time interactions in such settings to support effective learning and collaboration.

The findings study highlighted the constructivist learning theory's emphasis on active learner engagement and meaning-making through technology-enhanced pedagogies. For example, the integration of interactive platforms such as Microsoft Teams and accounting software aligns with constructivist principles by enabling learners to construct knowledge through collaboration and hands-on experience (Banihashem et al., 2022). The prevalence of digital tools, such as online projectors and tablets, supports the shift towards learner-centred instruction, which facilitates critical thinking and the practical application of accounting concepts, extending beyond traditional rote methods. However, the challenges related to teacher preparedness and resource limitations highlight the gap between theoretical ideals and practical realities. Despite constructivism's support for rich, technology-mediated learning environments, many teachers reported insufficient training and infrastructural support, which restricted the full realisation of these pedagogical innovations. This inconsistency highlights the need for further support of teacher development programs, enabling educators to confidently translate constructivist approaches into technologically mediated contexts (Fobert, 2024). Furthermore, the digital divide and learners varied technological competencies emphasise the importance of adaptive pedagogical strategies that accommodate diverse learner needs, a key principle of constructivist theory. Employing differentiated instruction and support may help mitigate cognitive overload, enabling learners to effectively connect complex accounting principles with technological tools (Sweller, 2020; Banihashem et al., 2022). The study thus confirms and extends constructivist understandings by illustrating the critical interplay between pedagogical theory, technological access, and educational equity in the South African Grade 10 accounting context.

The prominent use of digital tools such as Microsoft Teams, tablets, and online projectors reflects a shift towards learner-centred pedagogies, consistent with constructivist principles that prioritise collaboration, interaction, and hands-on activities. These tools enable learners to engage meaningfully with accounting concepts through real-world simulations and problem-solving exercises, aligning with research encouraging the integration of information technology and curriculum content as a dynamic, inseparable educational process (Zhou, 2017). The study highlights that technology-supported instruction facilitates scaffolding, allowing teachers to tailor support to learners' varying levels of digital literacy and accounting knowledge. This scaffolding is crucial in managing the cognitive load introduced by simultaneously mastering complex accounting principles and advanced technological tools (Sweller, 2020). The findings align with prior research, which has consistently demonstrated the effectiveness of differentiated instruction and project-based learning within technologically enriched environments in promoting deeper learning and learner autonomy (Antonietti, 2025; Rothwell, 2020).

However, the results also underline persistent challenges that impede pedagogical transformation, such as inadequate teacher training and uneven access to resources. These systemic barriers create a tension between the ideals of constructivist pedagogy and practical realities in under-resourced contexts (Msomi et al., 2025; Fobert, 2024). The reported lack of confidence and technical know-how among some teachers highlights the critical need for comprehensive professional development programs that integrate technological,

pedagogical, and content knowledge (TPACK) to bridge this gap (Nkomo et al., 2021). This aligns with the literature, which emphasises that the effective integration of technology requires not only device availability but also pedagogical readiness and ongoing technical support (Anthony Jr. & Noel, 2021). In applying these findings, schools and educational policymakers could consider fostering collaborative professional learning communities where teachers share best practices and co-develop technology-enhanced instructional strategies. Moreover, addressing infrastructural inequities through targeted investments may help minimise the digital divide, enabling a more equitable learning experience, an imperative echoed throughout South African education research (Eloff, 2016; Starkey, 2020). Comparatively, while some schools demonstrate high levels of technology adoption with active learner participation, others remain reliant on traditional approaches, revealing variability reminiscent of findings in other regions facing similar resource disparities (Onyema, 2020; Nkomo et al., 2021). This variability suggests opportunities for further comparative research to identify contextual factors that facilitate or hinder the successful integration of technology in accounting education.

8. CONCLUSION

The qualitative study has understood the transformative impact and critical importance of integrating advanced technology into Grade 10 accounting education within the South African context, particularly in the OR Tambo Coastal region. The research revealed that teachers have progressively adopted blended learning strategies that merge traditional pedagogical approaches with digital tools such as online platforms, interactive software, and accounting applications. These strategies have been instrumental in promoting increased learner engagement, fostering critical thinking skills, and enabling learners to work actively with accounting concepts in a dynamic, learner-centred environment, consistent with principles of constructivist learning theory (Banihashem et al., 2022).

However, the findings exposed considerable challenges that undermine the smooth and effective integration of technology in teaching Grade 10 accounting. Major barriers identified include insufficient teacher training in ICT and pedagogical strategies for technology use, limited access to necessary technological resources such as computers, internet connectivity, and specialised software, as well as technical difficulties experienced during instruction. These constraints have been compounded by systemic issues, such as overcrowded classrooms and resource inequities, which are particularly pronounced in rural and under-resourced schools (Msomi et al., 2025; Starkey, 2020). The digital divide creates disparities in learners' access to technology, which manifests in inconsistent learning outcomes and varying levels of digital literacy and accounting proficiency. Furthermore, the study highlighted a gap between teacher preparedness and the demands of the curriculum. While the post-pandemic era necessitated a rapid shift towards online and blended learning, many teachers lacked confidence and competence due to inadequate professional development opportunities, which limited their ability to effectively employ technological tools and digital pedagogies in accounting instruction (Sangster, Stoner, & Flood, 2020; Nkomo et al., 2021). This challenge is mirrored by learners, many of whom face their own technological skills deficits and attitudinal resistance towards technology-enhanced learning, with some preferring traditional learning modes due to unfamiliarity or discomfort with digital environments.

The curriculum has evolved, introducing complex topics such as auditing, internal controls, and financial analysis, which necessitate a deeper conceptual understanding supplemented by technological proficiency (Msomi et al., 2025). Yet, this expansion raises

concerns about cognitive load for learners who may simultaneously master intricate accounting concepts and sophisticated software functionalities. Effective scaffolding and instructional design are crucial for bridging the gap between theoretical knowledge and practical application through technology. Importantly, the study found evidence that where technology integration succeeds, it not only sustains instructional continuity during crises such as COVID-19 but also enriches learning experiences. Use of tools such as Microsoft Excel, virtual classrooms, and online collaborative platforms facilitated interactive lessons, timely feedback, and peer learning opportunities. These tools enhance learners' digital literacy, which is critical for the contemporary accounting profession, as it is increasingly automated and data-driven (Agustina & Setiawan, 2020; Haleem et al., 2022).

The study contributes to understanding how the integration of advanced technology in Grade 10 accounting teaching resonates with constructivist learning theory by fostering active, learner-centred environments that enhance critical thinking and real-world application. The high uptake of digital platforms and software tools among teachers reflects a progressive adoption of pedagogical strategies that empower learners to engage collaboratively and construct knowledge interactively. However, the findings reveal substantial barriers that hinder the full realisation of these theoretical ideals, including inadequate teacher training, limited resources, and uneven access to technology for learners. These constraints understand the pressing need for comprehensive, context-sensitive professional development that enhances educators' technological, pedagogical, and content knowledge, enabling them to effectively facilitate constructivist learning through digital means. Similarly, addressing infrastructural inequities is crucial to support equitable learner participation and the acquisition of digital literacy. Beyond confirming the theoretical benefits of technology in education, this study offers practical insights for policymakers and educators. The study emphasises strategic investments in technology infrastructure, sustained teacher capacity building, and curriculum enhancements that explicitly embed digital literacy alongside accounting competencies. These measures could better align teaching practices with constructivist principles, enriching educational experiences and preparing learners for a technologically advanced accounting profession.

9. RECOMMENDATIONS

The study recommends integrating advanced technology into Grade 10 accounting education within South Africa's resource-diverse context. Prioritising continuous, context-specific professional development for teachers is essential, focusing on building technological, pedagogical, and content knowledge (TPACK). Training could be hands-on, sustainable, and include peer mentoring and communities of practice to improve both technical proficiency and pedagogical skills. Addressing the digital divide requires strategic resource allocation and improved infrastructure, ensuring equitable access to devices, reliable internet, and curriculum-aligned software, particularly in rural and under-resourced schools. Strategic resource allocation could be essential to ensure equitable access to devices, reliable internet connectivity, and curriculum-aligned software, particularly in rural and under-resourced schools. Extending technology access to learners' homes through partnerships with community organisations and stakeholders may further support blended learning models. Supporting technology access at learners' homes through partnerships could further facilitate blended learning. Regular revision of assessments to integrate technology use is recommended to incentivise learner engagement with digital tools.

Updating the curriculum to explicitly embed digital literacy alongside accounting principles is critical. Curriculum and assessments could promote technological competence through authentic, scaffolded tasks reflecting real-world accounting scenarios. Similarly, learning training programs could bridge technical skill gaps with incremental digital literacy modules, motivational strategies, and peer learning to reduce resistance and build confidence. Fostering collaborative learning communities among teachers could encourage sharing of best practices and collective problem-solving. Robust technical support systems, featuring dedicated IT personnel and accessible troubleshooting resources, are vital to minimise disruptions and sustain engagement. Pedagogical approaches may adapt to learner diversity and software complexity by segmenting lessons, integrating formative assessments, and leveraging flipped classrooms and project-based learning to connect theory with practice. Addressing language and cultural barriers through translated materials and responsive teaching practices may enhance inclusion. Address language and cultural barriers through the use of translated teaching materials and responsive pedagogical strategies that accommodate diverse learner backgrounds, enhancing inclusion and equity in technology-enhanced accounting education.

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