



# Integrating ICT in Teaching Accounting in Secondary Schools: A Systematic Literature Review

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## ABSTRACT

This study explored the integration of Information and Communication Technology in teaching Accounting in secondary schools. Utilizing Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) and a systematic literature review to understand the integration of ICT tools in assisting learners to grasp the subject matter of Accounting in secondary schools. This was a qualitative study guided by the traditions of the interpretivism paradigm. Data were generated from related literature on the teaching of Accounting through infusing ICT. Various search engines, such as Google Scholar and Research Gate, played a crucial role in finding relevant research articles on the phenomenon. The following findings emerged, namely, (1) ICT Integration improves learner Engagement, (2) ICT as a Tool for Curriculum Coverage, (3) limited access to ICT tools, and last, Accounting teacher incompetency in using ICT. The study recommends that the Department of Basic Education must provide technological resources and offer training for teachers on the integration of ICT tools in teaching Accounting in schools. The study contributes to the scholarship of teaching and learning in Accounting education, especially in integrating ICT in Accounting.

*Keywords: Accounting, ICT tools, integration, technological knowledge*

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## Publication History

Received:

31<sup>st</sup> May, 2025

Accepted:

12<sup>th</sup> November, 2025.

Published:

30<sup>th</sup> December, 2025.

## To Cite this Article:

Muanalo, Andiswa Pride, and Sithembele Goodman Ndovela. "Integrating ICT in Teaching Accounting in Secondary Schools: A Systematic Literature Review." *Journal of Education and Learning Technology* 6, no. 12 (2025): 1513 - 1522. <https://doi.org/10.38159/jelt.202561221>

## INTRODUCTION

Accounting is one of the subjects offered in the Further Education and Training phase in the South African education system. This subject uses technical language to communicate financial information to the users.<sup>1</sup> Several research studies posit that Accounting involves identifying, recording, analysing, interpreting, and communicating financial information for users to make informed financial decisions.<sup>2</sup>

<sup>1</sup> Sithembele Goodman Ndovela, "Teaching Accounting Concepts in English Second Language Context: A Case Study of Three Accounting Teachers in Pinetown Education District," *PONTE International Scientific Researches Journal* 79, no. 10 (2023), <https://doi.org/10.21506/j.ponte.2023.10.1>; Jabulisile Ngwenya, "Accounting Teachers' Experiences of Communal Feedback in Rural South Africa," *South African Journal of Education* 39, no. S2 (December 31, 2019): 1–10, <https://doi.org/10.15700/saje.v39ns2a1502>.

<sup>2</sup> Jabulisile Ngwenya and Orhe Arek-Bawa, "Exploring the Quality of Grade 12 Accounting Education Textbooks," *The Journal for Transdisciplinary Research in Southern Africa* 15, no. 1 (August 27, 2019), <https://doi.org/10.4102/td.v15i1.662>; Makeresemese R.

The main goal of Accounting education is to produce skilful, competent, dynamic Accounting teachers and businessmen who are capable of competing effectively in the business world.<sup>3</sup> Accounting education is a skill subject that is supposed to develop the necessary skills and expertise for students' self-reliance.<sup>4</sup>

There have been numerous curriculum reforms in South Africa, such as the National Assessment Testing and Evaluation curriculum (NATED550), National Curriculum Statement (NCS), and the current Curriculum and Assessment Policy Statement (CAPS).<sup>5</sup> These changes triggered a paradigm shift in the teaching of the subject of Accounting from the procedural approach to the conceptual approach to teaching. Hence, there is a need to use innovative teaching strategies, such as information and communication technology (ICT), that stimulate learners' interest in the subject. Observably, in South Africa, the inculcation of ICT knowledge and skills to Accounting learners has been occurring at a steady pace.<sup>6</sup> The incorporation of ICT in teaching and learning in South African secondary schools and the world at large is very much imperative, not only for businesses but also for Accounting teachers.<sup>7</sup> Hence, Enaifoghe et al. argue that the introduction of ICT in Accounting education makes the teaching of financial Accounting easy and enhances learners' understanding of the subject.<sup>8</sup> Furthermore, several studies highlight the necessity for the incorporation of ICT into Accounting to significantly contribute to the development of an understanding of Accounting concepts, rules, and principles.<sup>9</sup> Therefore, it is very important to explore the integration of ICT in the teaching and learning of Accounting because it has the potential to improve student results.<sup>10</sup> This study, therefore, aims to explore how Information and Communication Technology (ICT) is integrated into the teaching of Accounting in South African secondary schools, with emphasis on the real-life experiences of teachers and learners.

## THEORETICAL FRAMEWORK

The study is underpinned by Mishra and Koehler's Technological Pedagogical Content Knowledge (TPACK) theory.<sup>11</sup> This theory serves as a way of thinking about the knowledge teachers need to understand to integrate technology into their teaching. It consists of three knowledge domains, namely, content, pedagogy, and technology. Accounting education, like all other school subjects in South Africa, is not immune to the ever-changing technological environment. Mishra and Koehler argue that teachers must know and understand the subject matter they teach.<sup>12</sup> The TPACK theory was relevant in identifying

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Qhosola, "12 - Accounting Teacher Preparation: A Critical Accounting Perspective," *Journal of Higher Education in Africa* 13, no. 1–2 (January 11, 2022), <https://doi.org/10.57054/jhea.v13i1-2.1525>.

<sup>3</sup> Nneka Salome and Festus Chukwunwendu, "Integrating Information and Communication Technology (ICT) in Accounting Education Instruction in Ekiti State Universities," *International Journal of Business and Social Science* 5, no. 6 (2014).

<sup>4</sup> Constance I Okoli and Ifeoma Stella Ozoegwu, "Accounting Students' perception on Adoption Of Self-Evaluation Learning Strategies For Enhanced Academic Performance In Colleges Of Education In South-East Nigeria," *NAU Journal of Technology and Vocational Education* 6, no. 1 (2021): 149–56.

<sup>5</sup> T. Ngwenya, "Teacher Competence and Technology Integration in Under-Resourced Schools," *South African Journal of Education* 40, no. 3 (2020): 1–11.

<sup>6</sup> Mlindeni Celinhlalo Siyaya et al., "The Impact of Information Communication Technology in Teaching Accounting in South African Secondary Schools," 2023.

<sup>7</sup> Peter Madoda and Agnes Chigona, "Uptake and Integration of ICTs for Pedagogy in Private High Schools in Cape Town," in *Society for Information Technology & Teacher Education International Conference* (Association for the Advancement of Computing in Education (AACE), 2019), 1216–24.

<sup>8</sup> A O Enaifoghe, Tolulope Balogun, and Oluwafemi Sunday Afolabi, "The Fourth Industrial Revolution: Integrating ICT in the South African Education System," *ResearchersWorld-International Refereed Social Sciences Journal* 12, no. 2 (2021): 33.

<sup>9</sup> Enaifoghe, Balogun, and Afolabi, "The Fourth Industrial Revolution: Integrating ICT in the South African Education System"; Siyaya et al., "The Impact of Information Communication Technology in Teaching Accounting in South African Secondary Schools."

<sup>10</sup> N. Jain, "Survey versus Interviews: Comparing Data Collection Tools for Exploratory Research," *The Qualitative Report* 26, no. 2 (2021): 541–54.

<sup>11</sup> Punya Mishra and Matthew J. Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge," *Teachers College Record: The Voice of Scholarship in Education* 108, no. 6 (June 2006): 1017–54, <https://doi.org/10.1111/j.1467-9620.2006.00684.x>.

<sup>12</sup> Mishra and Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge."

Accounting teachers' pedagogical knowledge of the processes and practices of teaching and learning in Accounting. More especially, technological knowledge, because, besides understanding or knowing the subject matter, teachers need to have a deeper understanding of how the Accounting subject can be taught through the application of ICT. This systematic literature review was able to establish how teachers know the specific technologies that are best suited for the particular subject matter of Accounting. Therefore, TPACK served as a relevant theoretical perspective to understand the intersection between Accounting teachers' pedagogy, content, and their understanding of ICT with reference to the teaching of Accounting in secondary schools.

## **METHODOLOGY**

### **Research Paradigm**

This study is guided by the interpretivism research paradigm, which is used to understand the subjective world of human experience. Interpretivism was well-suited for this study because it allowed the researchers to explore how teachers and learners perceive, experience, and respond to Information and Communication Technology (ICT) in Accounting classrooms. By adopting this paradigm, the study highlights the contextual and social dynamics that shape teaching practices. The study looked at how technology is incorporated into Teaching Accounting. This was based on the experiences and perspectives of both teachers and learners in environments that are often unequal.

### **Research Approach**

This study employed a qualitative research approach to explore the integration of ICT in the teaching and learning of Accounting. This approach enabled the collection of rich and detailed findings from the previous research studies on the phenomenon under exploration. The qualitative nature of this research allowed an in-depth exploration of both the benefits and challenges associated with integrating Information and Communication Technology (ICT) into Accounting education. It further enabled the researchers to gain insight into the technological tools currently used in classrooms to enhance the lessons, their effectiveness, and how they influence learner participation and understanding.

### **Research Design**

This was a systematic literature review research design. In the study, the researchers identified the research topic of ICT integration in the teaching of Accounting in Secondary schools. As a result, only empirical research articles on the use and integration of ICT in Accounting education were included. Accounting education is an under-researched area of research. Hence, few studies have been found in the South African context. Consequently, the researchers also selected literature from empirical studies undertaken in other countries, such as Nigeria. The purpose was to understand the dynamics of integrating ICT in teaching Accounting to secondary school learners. The common or similar research data or findings from reviewed articles were used to create themes that are reported as findings in the subsequent findings section.

### **Data Generation Methods and Analysis**

The data was generated from various search engines such as Google Scholar and Research Gate. These two search engines assisted me in finding articles on the integration of ICT in teaching Accounting in schools. In the 21<sup>st</sup> century, data is generated with technologies.<sup>13</sup> Hence, the aforementioned search engines were employed to generate relevant data on the phenomenon under exploration. Google Scholar was the most helpful because it generated a lot of articles on technology or ICT integration. However,

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<sup>13</sup> Jana Uher, "Data Generation Methods across the Empirical Sciences: Differences in the Study Phenomena's Accessibility and the Processes of Data Encoding," *Quality & Quantity* 53, no. 1 (January 27, 2019): 221–46, <https://doi.org/10.1007/s11135-018-0744-3>.

very few articles specifically for Accounting education, especially on the integration of ICT, were found. The reviewed articles were analysed thematically. Thematic analysis is defined as a method of identifying, analysing, and interpreting patterns of meaning within qualitative data.<sup>14</sup> From the reviewed articles, similar findings were grouped to form themes. A comprehensive review of the literature yielded several recurring themes on the integration of ICT in schools. These themes were reported as research findings that answered the research question.

### Sampling Method

In this research study, purposive sampling was used to select the most relevant research articles on integrating ICT in teaching Accounting in secondary schools. Only articles that focus on ICT integration in teaching Accounting were chosen. This assisted in addressing the phenomenon under interrogation. The rationale for adopting a purposive sampling strategy is based on the fact that only literature on ICT could provide findings on the teaching of Accounting with a special focus on technologically informed pedagogy.

## PRESENTATION OF FINDINGS AND DISCUSSION

### ICT Integration Improves Learner Engagement

The traditional teaching methods often fail to fully capture learners' attention, particularly in subjects such as Accounting. Accounting is frequently perceived as complex and difficult to understand because of its terminology and calculations.<sup>15</sup> Literature shows that ICT in education plays an essential role in enhancing learner engagement, which is a key factor in effective learning.<sup>16</sup> The integration of ICT into the teaching of Accounting can significantly enhance learner engagement and overall performance in the subject. This is because ICT enables learners to be more active and involved in lessons, as they are already familiar with digital tools and find learning through technology more interesting and engaging.<sup>17</sup> Mishra and Koehler posit that teachers need to understand and apply pedagogical strategies that apply technologies in a constructive way.<sup>18</sup> This will ultimately encourage learner engagement. Digital tools such as mobile devices, smartboards, simulations, and dynamic visualisations have altered education systems.<sup>19</sup> These tools enabled teachers to deliver subject content in ways that accommodate different learning styles while also enhancing learner engagement, encouraging collaboration, and fostering critical thinking skills.<sup>20</sup> These tools also help clarify complex concepts and encourage learners to actively engage in lessons. This paradigm shift is largely influenced by the increasing use of ICT in education, which has made learning more adaptable, accessible, and tailored to individual learner needs.<sup>21</sup>

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<sup>14</sup> Gareth Terry et al., "Thematic Analysis," *The SAGE Handbook of Qualitative Research in Psychology* 2, no. 17–37 (2017): 25.

<sup>15</sup> Rodrigo Macaraig Velasco, "Factors Associated with Failure in Accounting: A Case Study of the Omani Students Rodrigo M. Velasco1," *International Journal of Higher Education* 8, no. 6 (October 14, 2019): 157, <https://doi.org/10.5430/ijhe.v8n6p157>.

<sup>16</sup> Naning Tri Wahyuni and Gunawan Ariyanto, "Empowered Learners in a Digital Age: The Critical Nexus of Engagement, Agency, Interest, and Motivation," *Muslim Education Review* 3, no. 2 (December 31, 2024): 304–30, <https://doi.org/10.56529/mer.v3i2.261>.

<sup>17</sup> Simin Ghavifekr et al., "Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions," *Malaysian Online Journal of Educational Technology* 4, no. 2 (2016): 38–57; S. Ghavifekr and W. A. W. Rosdy, "Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools," *International Journal of Research in Education and Science* 1, no. 2 (2015): 175–91.

<sup>18</sup> Mishra and Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge."

<sup>19</sup> A. Haleem et al., "Understanding the Role of Digital Technologies in Education: A Review.," *Sustainable Operations and Computers* 3 (2022): 275–85.

<sup>20</sup> Shahid Rafiq, Saleem Iqbal, and Dr Afzal, "The Impact of Digital Tools and Online Learning Platforms on Higher Education Learning Outcomes," May 21, 2024.

<sup>21</sup> Rafiq, Iqbal, and Afzal, "The Impact of Digital Tools and Online Learning Platforms on Higher Education Learning Outcomes."

## ICT as a Tool for Curriculum Coverage

Information and Communication Technology (ICT) has proven to be a valuable tool for improving curriculum coverage in Accounting classrooms. Integrating technology into the classroom is one of the most efficient ways to minimize repetitive and time-consuming tasks performed by teachers.<sup>22</sup> ICT can be used to support the effective delivery of the entire curriculum, helping overcome challenges such as limited time and insufficient resources. Covering the curriculum on time indicates that the teacher understands the subject matter. This agrees with Mishra and Koehler, who suggest that understanding the subject matter is very important when incorporating technology in teaching.<sup>23</sup> The global outbreak of the COVID-19 pandemic disrupted educational activities across the world, leading to the adoption of online learning as a new approach to delivering education.<sup>24</sup> Teachers were using ICT to deliver the Accounting content to learners and cover the curriculum in a timely manner. ICT integration in secondary education offers several benefits, particularly through some improvements in the teaching and learning processes that directly enhance curriculum coverage.<sup>25</sup> This emphasises that ICT fosters more equitable access to Accounting educational resources and content, which can lead to more consistent and complete delivery of Accounting curricula across diverse learner populations. ICT enhances learning by making abstract concepts easier to understand and allowing learners to learn at their own pace.<sup>26</sup> This benefit and the ability to revisit or extend lessons through ICT support revision and consolidation of topics without disrupting the teaching schedule. The amount of time allocated in the Annual Teaching Plan (ATP) for Accounting may hinder effective teaching and learning, potentially affecting learner performance negatively.<sup>27</sup> However, the integration of ICT into Accounting helps teachers maintain the pace of the ATP, addressing time-related challenges. Overall, the integration of ICT in Accounting enables more structured and flexible lesson planning, contributing to improved curriculum coverage and more consistent learner progress.

## Limited Access to ICT tools

ICT is increasingly important because it enables flexibility and empowers learners to be active in their learning through the use of digital tools.<sup>28</sup> However, lack of access to digital resources presents a significant challenge that prevents teachers from effectively integrating ICT into education.<sup>29</sup> When ICT tools and resources are available, they allow learners to access the subject content and engage with the learning material in their own time. Learners who progress more quickly can move ahead without being held back, while those who need more time can work at their own pace without feeling pressured to keep up.<sup>30</sup> This helps reduce frustration among learners, allowing them to focus more on understanding the Accounting subject matter rather than just completing tasks. This is consistent with Mishra and Koehler, who argue that the use of technology in teaching accounting enhances learners' comprehension of the

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<sup>22</sup> Haleem et al., "Understanding the Role of Digital Technologies in Education: A Review. ."

<sup>23</sup> Mishra and Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge."

<sup>24</sup> Shengnan Yang et al., "The Use of <sc>ICT</Sc> during <sc>COVID</Sc> -19," *Proceedings of the Association for Information Science and Technology* 57, no. 1 (October 22, 2020), <https://doi.org/10.1002/ptra.2297>.

<sup>25</sup> Mgambi Msambwa Msafiri, Daniel Kangwa, and Lianyu Cai, "A Systematic Literature Review of ICT Integration in Secondary Education: What Works, What Does Not, and What Next?," *Discover Education* 2, no. 1 (November 16, 2023): 44, <https://doi.org/10.1007/s44217-023-00070-x>.

<sup>26</sup> Siyaya et al., "The Impact of Information Communication Technology in Teaching Accounting in South African Secondary Schools."

<sup>27</sup> Mantekana J. Letshwene and Elize C. du Plessis, "The Challenges of Implementing the Curriculum and Assessment Policy Statement in Accounting," *South African Journal of Education* 41, no. Supplement 2 (December 31, 2021): S1–10, <https://doi.org/10.15700/saje.v41ns2a1978>.

<sup>28</sup> Sumbul Siddiqui, "ICT Tools in Education," *International Journal For Multidisciplinary Research* 6, no. 2 (April 20, 2024), <https://doi.org/10.36948/ijfmr.2024.v06i02.17712>.

<sup>29</sup> Ghavifekr et al., "Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions."

<sup>30</sup> Haleem et al., "Understanding the Role of Digital Technologies in Education: A Review. ."

subject matter.<sup>31</sup> Despite these benefits, many schools in South Africa face significant challenges in integrating ICT into the teaching of accounting due to the limited access to ICT tools. The digital divide extends beyond just having physical access to devices and internet connectivity. It also includes access to essential resources like relevant content and technological literacy.<sup>32</sup>

Most schools are under-resourced and do not have access to ICT tools such as reliable internet and relevant software, which hinders the effectiveness of utilizing digital tools in the classroom. Adequate school resources are essential for effective curriculum delivery and improved learner performance.<sup>33</sup> The distinction between rural and urban schools is often used to highlight the different access to adequate educational resources.<sup>34</sup> In well-resourced schools, learners benefit from stable connectivity and teachers who can effectively integrate ICT into their accounting lessons to deliver the curriculum content. However, in poorly resourced schools, the absence of such support creates unequal learning experiences in the country, which widens the gap in educational outcomes. Curriculum delivery is the process of teaching, learning, and assessment carried out to ensure effective education in schools.<sup>35</sup> Just as learners in Science streams are supported through laboratories and chemicals for their learning, Commerce learners should also receive equal support through technology integration because Accounting is equally practical and application-based, like Physical Sciences.

### **Accounting teacher's incompetence in using ICT.**

Teacher competency and training in ICT are essential for the effective teaching of accounting in modern education systems, especially since digital tools have become increasingly embedded in classroom practice. Competence refers to the capacity to handle complex tasks by applying relevant knowledge, skills, and attitudes within a specific context.<sup>36</sup> These competencies include skills in the digital planning and creation of assessments, managing the digital learning environment, and the general use of ICT. Competencies for teachers encompass both technological and pedagogical elements; technological skills involve the ability to operate devices such as computers and mobile applications, while pedagogical skills focus on effectively integrating these tools into curriculum planning and accounting teaching methods.<sup>37</sup> This shows a clear distinction between ICT literacy and ICT competency because ICT literacy focuses on the basic skills to operate digital tools, while ICT competency involves more advanced abilities such as integrating technology into lessons. Many teachers are unable to effectively integrate ICT in classrooms due to limited access to adequate training opportunities.<sup>38</sup>

These teachers lack the technological knowledge to incorporate ICT in their teaching of accounting.<sup>39</sup> Despite the importance of these competencies, many Accounting teachers still face

<sup>31</sup> Mishra and Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge."

<sup>32</sup> Arfa Afzal et al., "Addressing the Digital Divide: Access and Use of Technology in Education," *Journal of Social Sciences Review* 3, no. 2 (June 30, 2023): 883–95, <https://doi.org/10.54183/jssr.v3i2.326>.

<sup>33</sup> Oluwatoyin Ayodele Ajani, "Challenges of School Resources Management for Curriculum Delivery in South African Rural High Schools: Principals' Perceptions on the Way Forward," *International Journal of Research in Business and Social Science* (2147- 4478) 12, no. 6 (September 14, 2023): 275–85, <https://doi.org/10.20525/ijrbs.v12i6.2709>.

<sup>34</sup> Dumisani Wilfred Mncube et al., "Exploring the Problems of Limited School Resources in Rural Schools and Curriculum Management," *UMT Education Review* 6, no. 2 (October 24, 2023): 1–31, <https://doi.org/10.32350/UER.62.01>.

<sup>35</sup> Ajani, "Challenges of School Resources Management for Curriculum Delivery in South African Rural High Schools: Principals' Perceptions on the Way Forward."

<sup>36</sup> Maria Napal Fraile, Alicia Peñalva-Vélez, and Ana María Mendióroz Lacambra, "Development of Digital Competence in Secondary Education Teachers' Training," *Education Sciences* 8, no. 3 (July 20, 2018): 104, <https://doi.org/10.3390/educsci8030104>.

<sup>37</sup> Jiri Vilppola et al., "Teacher Trainees' Experiences of the Components of ICT Competencies and Key Factors in ICT Competence Development in Work-Based Vocational Teacher Training in Finland," *International Journal for Research in Vocational Education and Training* 9, no. 2 (June 1, 2022): 146–66, <https://doi.org/10.13152/IJRVET.9.2.1>.

<sup>38</sup> Taban Habibu, Abdullah Al Mamun, and Che Clement, "Difficulties Faced by Teachers in Using ICT in Teaching-Learning at Technical and Higher Educational Institutions of Uganda," *International Journal of Engineering Research & Technology* 1 (October 12, 2012).

<sup>39</sup> Mishra and Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge."

challenges due to insufficient training and support. Notable variations were observed in teachers' readiness to learn, with individual characteristics and attitudes toward using ICT playing a key role in digital competence.<sup>40</sup> The lack of training on how to integrate ICT into lessons for meaningful instruction creates a significant gap in teacher readiness. Certain individuals may be hesitant to adopt digital tools because they are uncomfortable with change or they prefer traditional teaching methods.<sup>41</sup> Teachers are often resistant to adapting to change and are attached to traditional teaching methods because they find the use of technology disruptive for learners. Emphasizing digital teacher training is essential as it transforms teaching practices and redefines the teacher's role by incorporating new skills. Teachers become facilitators of knowledge construction while effectively managing the technological tools and competencies required in the digital age.<sup>42</sup>

## RECOMMENDATIONS

There is a general agreement emanating from scholarship on integrating ICT in the teaching of Accounting. ICT is very important in enhancing learners' comprehension of the Accounting subject matter. Hence, this paper offers two significant recommendations. The first primary recommendation is that there is a greater need for Accounting teachers to be supported through training and professional development to ensure a successful integration of Information and Communication Technology (ICT) in the teaching of Accounting. This emerges from the reviewed literature that Accounting teachers are unable to properly use ICT tools when teaching Accounting in schools. The final recommendation is directed to the school management of schools offering the Accounting subject. The Department of Basic Education must provide resources such as computers, tablets, and a stable network for teachers and learners to access relevant ICT tools for the teaching of the Accounting subject.

## CONCLUSION

The study focused on the integration of ICT in the teaching of Accounting in secondary schools. There is widespread agreement that ICT enhances learner engagement. This ultimately improves learner understanding of the Accounting subject matter. ICT plays a significant role in subjects such as Accounting. The findings revealed that through integrating ICT, teachers could complete the syllabus in the stipulated time. However, the beauty of ICT does not go without any challenges. It has emerged that teachers and learners experience limited access to ICT tools. This is due to the limited availability of resources, especially in rural schools. Another major finding shows the incompetence of Accounting teachers regarding the use of ICT. Possessing technological knowledge is viewed as a very important knowledge for the successful infusion of technology in the teaching of Accounting in schools.

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<sup>40</sup> El Mustapha Baytar et al., "Teachers' Sense of Competence in Terms of ICT Use: The Case of Secondary School Teachers," *Research in Learning Technology* 31 (May 26, 2023), <https://doi.org/10.25304/rlt.v31.2874>.

<sup>41</sup> Vikela Liso Sithole and Ifeanyi Mbukanma, "Prospects and Challenges to ICT Adoption in Teaching and Learning at Rural South African Universities: A Systematic Review," *Research in Social Sciences and Technology* 9, no. 3 (October 3, 2024): 178–93, <https://doi.org/10.46303/ressat.2024.54>.

<sup>42</sup> José María Fernández-Batanero et al., "Digital Competences for Teacher Professional Development. Systematic Review," *European Journal of Teacher Education* 45, no. 4 (August 8, 2022): 513–31, <https://doi.org/10.1080/02619768.2020.1827389>.

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