



Exploring Teachers' Understanding of Integration of Information and Communication Technology in Teaching Accounting in Umlazi District

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ABSTRACT

The purpose of this study was to explore Accounting teachers' understanding of the integration of Information and Communication Technology (ICT) in teaching Accounting in Umlazi District, South Africa. The literature indicates that ICT has been adopted by the education sector worldwide. To integrate ICT in teaching, teachers must possess knowledge of ICT integration. Hence, this study explored Accounting teachers' understanding of ICT integration. To complement the literature, the Technological Pedagogical and Content Knowledge (TPACK) theoretical framework informed the empirical inquiry. This study adopted a mixed-methods approach and an explanatory sequential research design to understand the research phenomenon rigorously. Quantitative information was initially collected using a custom-developed questionnaire, followed by qualitative data generated through semi-structured interviews. One hundred and seventy-nine Accounting teachers were randomly sampled for quantitative research, and fourteen were purposively selected for qualitative interviews. Quantitative data was analysed through Statistical Package for the Social Sciences (SPSS), and qualitative data were analysed thematically. The findings indicated that Accounting teachers' understanding of ICT integration is limited. Findings further indicated that teachers are knowledgeable about smartphones, and they often use them for teaching. Considering the findings, this study recommended that the Department of Basic Education should initiate ICT professional development programmes. Programmes should concentrate on training teachers on practical ICT integration knowledge and skills. Insights from this article will benefit teachers and the Department of Basic Education as they strive to incorporate ICT into their teaching methods while making a timeous contribution to the scholarship of teaching and learning to enhance sustainable digital teaching practices.

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INTRODUCTION

The exponential growth of Information and Communication Technology throughout the globe has resulted in the introduction and advancements of ICT resources in the education sector. Globally, schools are introducing ICT resources such as electronic devices (laptops, chrome books), handheld devices (iPads, iPods), interactive devices (interactive whiteboards), application software, and social

media tools that are used for commerce and communication.¹ Furthermore, various scholars assert that the modern digital devices that have been observed in schools include laptops, tablets, whiteboards, overhead projectors, network computers, digital scanners and the Internet.² The intention of introducing ICT tools in schools is to embrace ICT integration in teaching and learning. In South Africa, the introduction of ICT tools is supported by the ICT policy, which aims to ensure that teachers of individual subjects can utilise all ICT applications to integrate ICT in teaching sufficiently.³

Although ICT resources are introduced in schools, there are still notable hindrances to successful integration, particularly in Accounting teaching. Siyaya contested that in rural areas, Accounting teachers do not have access to technology resources. As a result, they do not integrate digital tools when they are teaching.⁴ Furthermore, Skhephe et.al., argue that Accounting teachers still hardly utilise technology devices due to a shortage of ICT tools and skills.⁵ Teachers continue with the traditional teaching method even though ICT integration has been introduced in schools. Additionally, Skhephe et.al., maintain that Accounting teachers fail to integrate ICT into the curriculum since the policy on e-Education was too wide and not precise for each subject.⁶ Accounting teachers have inadequate computer skills to integrate ICT in their classrooms.

According to Mathevula and Uwizeyimana, scarcity of funds is the main drawback in integrating ICT into accounting education.⁷ A lack of understanding of ICT integration could be a drawback in successful integration. The literature demonstrates limited studies focusing on teachers' understanding of ICT integration. Thus, this study is unique. The study is also unique in the sense that it seeks to address a gap in teachers' limited understanding of ICT integration in this digital era. Most previous studies concentrate on teachers' ICT integration, not understanding. Understanding comes first, then the integration. Therefore, it is crucial to be informed about the extent to which teachers understand ICT integration; hence, the current study is conducted. The critical research question that guided this study was: What is Accounting teachers' understanding of the integration of ICT in teaching Accounting in Umlazi District? The findings are presented in subsequent sections.

LITERATURE REVIEW

ICT Integration

The evolution of ICT integration in the classroom due to modernisation has led to massive debate around the phenomenon of ICT integration. Hero postulates that ICT integration includes factors intertwined at school, which include curriculum, teacher characteristics, training and development, infrastructure, and organisational factors like school leadership, school culture, and supportive framework.⁸ ICT integration is a multi-dimensional method that requires a broad understanding and exploration of the many opportunities that ICT offers. It requires creativity and imagination from both teachers and learners, and teachers should believe that learners can also contribute to the learning experience. ICT integration in education and the classroom demonstrates a collaboration, a mixture of

¹ Elisheba W Kiru, "Mathematics Teachers' Use of Information and Communication Technologies: An International Comparison.," *International Journal of Research in Education and Science* 4, no. 1 (2018): 165–77.

² Daniel King, "Active Learning in Accounting and the Impact on Student Engagement," in *ECEL 2020 19th European Conference on E-Learning* (Academic Conferences International Limited, 2020), 252; Melikhaya Skhephe and Ntombekhaya Princess Caga, "Chronicling Factors Affecting Technology Integration in Accounting Classrooms: A Case of Secondary Schools in the Eastern Cape," *Journal of Human Ecology* 68, no. 1–3 (October 8, 2019): 213–21, <https://doi.org/10.31901/24566608.2019/68.1-3.3195>; Mlindenhi Celinhlalo Siyaya, "Factors Influencing Learner Performance in the Economic and Management Sciences in the Ilembe District" (University of Zululand, 2019).

³ Department of Education, *Draft White Paper on E-Education-Transforming Learning and Teaching through Information and Communication Technologies (ICTs)*, *Government Gazette*, 470, (26734) (Pretoria: Government printers., 2004).

⁴ Siyaya, "Factors Influencing Learner Performance in the Economic and Management Sciences in the Ilembe District."

⁵ Skhephe and Caga, "Chronicling Factors Affecting Technology Integration in Accounting Classrooms: A Case of Secondary Schools in the Eastern Cape."

⁶ Melikhaya Skhephe and Martha Matashu, "The Use of Technology in Accounting Classrooms During COVID-19: What Do Accounting Teachers in the Eastern Cape, South Africa, Have to Say?," *Research in Social Sciences and Technology* 6, no. 2 (October 1, 2021): 267–78, <https://doi.org/10.46303/ressat.2021.30>; Skhephe and Caga, "Chronicling Factors Affecting Technology Integration in Accounting Classrooms: A Case of Secondary Schools in the Eastern Cape."

⁷ Mlungishi D Mathevula and Dominique E Uwizeyimana, "The Challenges Facing the Integration of ICT in Teaching and Learning Activities in South African Rural Secondary Schools," *Mediterranean Journal of Social Sciences* 5, no. 20 (2014): 1087–97.

⁸ Jesson L Hero, "Teachers' Preparedness and Acceptance of Information and Communications Technology (ICT) Integration and Its Effect on Their ICT Integration Practices," *Puissant* 1 (2020): 59–76.

various technology resources to produce knowledge. Chisango and Marongwe maintain that ICT integration in the education system is crucial to improve teaching and learning and respond to the technological needs of today's digital era.⁹ Consequently, Naidoo et.al. point out that the majority of African countries are making attempts to integrate ICT into teaching and learning in schools.¹⁰

The attempt to integrate ICT has been observed in developing ICT policies, such as the White-Paper on e-Education in many African countries to support the integration.¹¹ Nevertheless, Padayachee argues that the DoE policy framework on e-Education does not clearly clarify its objectives, the budget for ICT, the resources needed, and the implementation strategies in the classroom, resulting in vague technological pedagogy and uncertainty about appropriate technology resources to integrate into the classroom.¹² Meyer and Gent note that although the strategy and policy are available, implementation is slow, and capacity is limited.¹³ Objectives are not clear and a strategy that is integrated across the system is lacking. Access to technology is limited and unequal across provinces and school quintiles, which affects ICT integration in education. In this study, ICT integration covers all technology tools, hardware, and software that may be utilised in teaching and learning Accounting in a classroom. Comprehending the importance of ICT integration in Accounting is also vital in this study.

Importance of ICT Integration in Accounting

Accounting is one of the subjects that emphasises and recognises the vital role of ICT integration in Accounting pedagogy due to its practical nature. Yisau and Tiamiyu posit that the appropriate use of technology in accounting classrooms can provide model modification in terms of the content and pedagogy, which in turn, usher in reforms.¹⁴ King asserts that ICT integration in Accounting improves the productivity of learners and creates an opportunity for learners to learn more information about Accounting on their own without relying on teachers.¹⁵ Skhephe and Ntombekhaya state that ICT integration in Accounting improves the relationship between a teacher and a learner, which causes the learner to be more collaborative in Accounting learning.¹⁶ Furthermore, King states that when teachers integrate ICT into Accounting teaching and learning, they become agents of learning, providing new knowledge and skills and constantly searching for subject information to update learners.¹⁷

ICT is significant in the sense that it gives teachers opportunities to utilise the internet to search for additional activities online for learners to practice every day, to assist Accounting learners and teachers in keeping up with Accounting standards. Furthermore, all Accounting topics in the Further Education and Training (FET) phase require integration of ICT to enhance learners' understanding and complement teachers' teaching materials. The rationale is that ICT tools provide additional information in a multifaceted way that allows learners to conceptualise the topic. For instance, Accounting has its own unique concepts that learners need to develop a profound understanding of; therefore, ICT integration is crucial to assist learners in searching for these concepts on the internet for greater

⁹ Grasia Chisango and Newlin Marongwe, "The Digital Divide at Three Disadvantaged Secondary Schools in Gauteng, South Africa," *Journal of Education*, no. 82 (2021), <https://doi.org/10.17159/2520-9868/i82a09>.

¹⁰ Gedala Mulliah Naidoo, Minenhle Madida, and Humduth Rugbeer, "Conceptual Framework for ICT Integration in Rural Secondary Schools in South Africa," *Journal of Gender, Information and Development in Africa* 8, no. 3 (December 15, 2019): 187–212, <https://doi.org/10.31920/2050-4284/2019/8n3a9>.

¹¹ O.A Ojo and E.O.Adu, "The Effectiveness of Information and Communication Technologies (ICTs) in Teaching and Learning in High Schools in Eastern Cape Province," *South African Journal of Education* 38, no. Supplement 2 (December 31, 2018): 1–11, <https://doi.org/10.15700/saje.v38ns2a1483>; Chisango and Marongwe, "The Digital Divide at Three Disadvantaged Secondary Schools in Gauteng, South Africa."

¹² Keshnee Padayachee, "A Snapshot Survey of ICT Integration in South African Schools," *South African Computer Journal* 29, no. 2 (2017): 36–65.

¹³ I. A. Meyer and P. R. Gent, "The Status of ICT in Education in South Africa and the Way Forward," *National Education Collaboration Trust*, 2016.

¹⁴ Babalola Yisau Abiodun and R. Tiamiyu, "The Use of ICT in Teaching and Learning of Accounting Education in Nigeria," in *33rd Annual Convention and International Conference of Nigeria Association for Educational Medial and Technology (NAEMT) at Emmanuel Alayande College of Education, Oyo State, Nigeria*, 2012.

¹⁵ King, "Active Learning in Accounting and the Impact on Student Engagement."

¹⁶ Skhephe and Caga, "Chronicling Factors Affecting Technology Integration in Accounting Classrooms: A Case of Secondary Schools in the Eastern Cape."

¹⁷ King, "Active Learning in Accounting and the Impact on Student Engagement."

understanding. Skhephe and Ntombekhaya mention the significance of technology in accounting subjects in advancing the curriculum and enhancing content understanding.¹⁸

Teachers' understanding of integrating ICT in teaching

Teachers' understanding is crucial to measuring their knowledge and skills regarding ICT integration in general. Teachers' understanding reveals both external and internal experiences. This is confirmed by the literature on teachers' understanding of ICT integration in schools.¹⁹ These scholars showed that teachers accepted and recognised the value of ICT in the education system; however, their understanding was not equivalent. A study conducted by Zulu indicated that teachers had different levels of understanding and implemented different practices regarding ICT integration in Mathematics, although they all believed it would support instruction.²⁰ Stoilescu found that Mathematics teachers showed a disconnect between Mathematics theory and practice when they integrated ICT and thus failed to utilise all available technology when teaching Mathematics.²¹ Pirtheepal found that teachers had a moderate understanding of ICT integration in English and that ICT integration supported their teaching and students' learning process.²² The overall finding from the above-mentioned studies is that teachers have an idea of ICT, and they are fascinated by ICT integration in all school subjects; nevertheless, they have encountered substantial setbacks. To further comprehend teachers' understanding, it is crucial to describe the theory underpinning this study.

THEORETICAL FRAMEWORK

TPACK was used to frame the study. TPACK is a theoretical framework that explains and defines the types of knowledge required by a teacher for effective pedagogical practice in a technology-enhanced classroom.²³ According to Meyer and Gent, TPACK highlights the important knowledge components to consider for the successful integration of technology in the instructional process.²⁴ Furthermore, Amory and Mhlanga concur that this theoretical framework supports teachers in integrating technology theory and practice into the teaching and learning process.²⁵ This theory was relevant in this study in the sense that it gave comprehension of what knowledge and understanding Accounting teachers necessitate for ICT integration. The types of knowledge mentioned in the theory were aligned with ICT integration understanding, such as technology knowledge. This theory gave guidance on identifying Accounting teachers' understanding of ICT integration.

Initially, the Technological Pedagogical Content Framework (TPCK) was designed by Shulman to include teacher knowledge in the pedagogy and content of a subject.²⁶ Shulman's framework focused on three important elements, namely, Pedagogical Knowledge (PK), Content Knowledge (CK) and

¹⁸ Skhephe and Caga, "Chronicle Factors Affecting Technology Integration in Accounting Classrooms: A Case of Secondary Schools in the Eastern Cape."

¹⁹ Ronald Manhibi, "Information and Communication Technologies Integration into Early Childhood Development Education in Masvingo Province, Zimbabwe: A Critical Analysis," *Unpublished Doctor of Philosophy Dissertation*. Durban: University of KwaZulu-Natal (University of KwaZulu-Natal, 2019), <https://core.ac.uk/download/pdf/304374529.pdf>; Siyaya, "Factors Influencing Learner Performance in the Economic and Management Sciences in the Ilembe District"; Rohith Rambrij, "Technology Literacy for Teachers in Rural Schools : Constructing Key Concepts in Technology Education for Teachers in the Ilembe District" (Durban University of Technology, 2018), <https://openscholar.dut.ac.za/items/4a05d4e1-99e7-4166-abe8-f049613e7f86>; Shirley Sympathonia Mukhari, "Teachers' Experience of Information and Communication Technology Use for Teaching and Learning in Urban Schools" (University of South Africa, 2016), <https://uir.unisa.ac.za/items/d4ead6c3-1562-45b8-b84a-67516bbb6208>.

²⁰ Mzwandile Wiseman Zulu, "An Exploration of the Integration of Technology by Mathematics Teachers: The Case of 10 Schools in KwaZulu-Natal under Umlazi District" (University of Kwazulu-Natal, 2020), <https://researchspace.ukzn.ac.za/items/fb191236-62db-4c1e-9541-cfbc69d99907>.

²¹ Dorian Stoilescu, *Studying Challenges in Integrating Technology in Secondary Mathematics with Technological Pedagogical and Content Knowledge (TPACK)*. (ERIC, 2014).

²² Pirtheepal, Tashmika. "Exploring teachers' experiences of implementing an integrated natural science and technology curriculum in the intermediate phase." PhD diss., 2019.

²³ Matthew J. Koehler et al., "The Technological Pedagogical Content Knowledge Framework," in *Handbook of Research on Educational Communications and Technology* (New York, NY: Springer New York, 2014), 101–11, https://doi.org/10.1007/978-1-4614-3185-5_9.

²⁴ Meyer and Gent, "The Status of ICT in Education in South Africa and the Way Forward."

²⁵ A. Amory, F. Rahiman, and E. Mhlanga, "Rapid Research on the Use of ICT in Education," *South African Institute for Distance Education*, 2015.

²⁶ Lee S Shulman, "Those Who Understand: Knowledge Growth in Teaching," *Educational Researcher* 15, no. 2 (1986): 4–14.

Pedagogical Content Knowledge (PCK). Later Koehler and Mishra.²⁷ modified Shulman's framework by adding Technology Knowledge (TK) to develop the TPACK. In the context of this study, two elements were used to understand the research phenomenon rigorously. The two elements were: Technological Pedagogical Knowledge and Technological Content Knowledge. Each element is vital in demonstrating what knowledge teachers need to understand ICT integration. Through this theory, it was clear that Accounting teachers' understanding of ICT integration involves teacher knowledge in pedagogy, subject content and technology. In this study, TPACK informed the teachers' understanding of ICT integration in accounting, as questionnaires were developed under TPACK elements. In other words, each theme consisted of questionnaires derived from the elements' descriptions. This made it easy to acquire relevant data on Accounting teachers' ICT integration.

METHODOLOGY

Study Approach, Paradigm and Design

This study employed a mixed-method approach with the intention of using both quantitative and qualitative methods to conduct the research. Patten and Newhart believe that the mixed-method approach works best since the researcher can utilise both quantitative and qualitative approaches at once to gather information.²⁸ This approach provided comprehensive data on teachers' understanding of ICT integration. Furthermore, pragmatism was adopted as the research paradigm. According to Creswell and Creswell, pragmatic researchers concentrate on what and how questions, which are essential to comprehend the intended results.²⁹ This paradigm provided concrete information to understand what understanding, worldviews and beliefs teachers have on ICT integration in teaching Accounting. An explanatory sequential mixed-method research design was employed to comprehend teachers' understanding of ICT integration in teaching Accounting. The explanatory sequential mixed-method research provides the researcher with a two-stage model of data collection.³⁰ The two-stage model created the opportunity to collect data in two categories. The first category collected data using the quantitative method (questionnaires) and then analysed the data collected to build on the next category. The next category was to collect data using qualitative methods (interviews) and then analyse it to support the quantitative data generated. These two categories are more accurate since qualitative data provides a clear understanding of the quantitative data.

Sampling and Population

This study targeted a population of Accounting teachers in the Umlazi Durban South District. Therefore, 179 Accounting teachers were simply randomly selected for quantitative data; however, only 129 (83 females and 46 males) ended up participating, and the rest were not willing to participate. Therefore, the response rate was 85,4%. In the Umlazi district, schools are clustered in groups according to their closeness to each other, and that is regarded as a circuit. For qualitative data in this study, one teacher was purposively sampled from each circuit for semi-structured interviews. Umlazi district has 14 Accounting circuits; thus, in total, 14 Accounting teachers participated in interviews. Convenience sampling was used under purposive sampling since the aim was to select participants who were more convenient. Through convenience sampling, it was easy to obtain participants for the study, as accessibility was also very high. Gutterman argues that mixed-method sampling strategies involve using both probability and non-probability sampling in selecting cases for a research study.³¹ Thereafter, data was collected.

²⁷ Matthew Koehler and Punya Mishra, "What Is Technological Pedagogical Content Knowledge (TPACK)?," *Contemporary Issues in Technology and Teacher Education* 9, no. 1 (2009): 60–70.

²⁸ M. L. Patten and M. Newhart, *Understanding Research: An Overview of the Essentials*, 10th ed. (New York: Routledge, 2018).

²⁹ John W Creswell and J David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Sage publications, 2017).

³⁰ Timothy C. Guetterman et al., "Process Evaluation of a Retreat for Scholars in the First Cohort: The NIH Mixed Methods Research Training Program for the Health Sciences," *Journal of Mixed Methods Research* 13, no. 1 (January 26, 2019): 52–68, <https://doi.org/10.1177/1558689816674564>.

³¹ Guetterman et al., "Process Evaluation of a Retreat for Scholars in the First Cohort: The NIH Mixed Methods Research Training Program for the Health Sciences."

Data Collection

This study utilised questionnaires and semi-structured interviews to collect data. The questionnaire consisted of closed-ended questions to collect responses on teachers' understanding of ICT integration in teaching Accounting. The questionnaires were designed according to each TPACK element context, and participants were asked to rate their responses on a Likert Scale of strongly disagree, disagree, neither disagree nor agree, agree and strongly agree. Questionnaires were distributed electronically to teachers via WhatsApp and email. The questionnaires were previously used by Koehler et.al., however, in this study, they were reconstructed to suit the context of the study.³² After questionnaires were returned, they were analysed, and the second phase of generating data through a qualitative method followed. The rationale for the qualitative component was to ensure that in-depth data was obtained to understand participants' responses to the quantitative data. Semi-structured interviews with Accounting teachers in secondary schools were administered. Each interview lasted 60 minutes per teacher and took place in the teacher's natural setting via Zoom and WhatsApp. The interview schedule was used, and the questions asked were evaluating teachers' understanding of ICT integration. The interviews were digitally recorded for transcribing and safekeeping. Data were stored on a laptop computer and later analysed.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) version 27 was employed to analyse the quantitative data collected. Quantitative data was reduced and analysed using inferential statistical analysis. Data analysis was recorded in the form of tables and graphs and supplemented by qualitative findings. Thematic analysis was administered in the following ways to analyse qualitative data: firstly, we listened to the audio several times. Secondly, data was transcribed into texts, and the transcript was read several times; thirdly, similar data from transcripts were grouped to develop themes. Fourthly, the data was reread to check if the themes that had been identified corresponded with what the participants had said and with the research question. Thematic content analysis has been discussed in the literature as one of the methods that can be used in qualitative research to analyse data and measure trustworthiness in research.³³ To report on the data analysed, a written presentation including the voices of participants, descriptions and literature was provided. Validity and reliability were ensured through a pilot study and member check method. The pilot study was conducted with ten teachers who were willing and available. In the pilot study, the reliability check indicated that the element of TCK had poor internal consistency with a Cronbach's alpha coefficient reported below .5. This meant that most items did not correlate. Therefore, the items were removed. For member checking, after the data had been analysed, it was sent to participants to validate the accuracy of the data they provided.

Ethics Considerations

Before proceeding to data collection, permission to conduct the study was granted by the University of KwaZulu-Natal (UKZN) Research and Ethics Committee. Authorisation was also requested from the KZN DoE (Pietermaritzburg) to conduct research in Umlazi District schools. After permission was granted with ethics number: HSSREC/00004068/2022, consent forms were issued via WhatsApp or e-mail to principals of the schools and teachers to inform them about the study. Informed consent letters explicitly described the nature of the study and its objectives, confidentiality, anonymity, voluntary participation, and withdrawal time.

PRESENTATION OF FINDINGS

Two TPACK elements were selected to measure teachers' knowledge, namely Technological Content Knowledge and Technological Pedagogical Knowledge. The two elements were selected because the items in each element relate to teachers' knowledge of integrating ICT in teaching Accounting. Additionally, there is an interaction between Content, Pedagogy and Technology for teachers to integrate ICT into teaching Accounting. Participants' responses (quantitative findings) are presented in

³² Koehler et al., "The Technological Pedagogical Content Knowledge Framework."

³³ Creswell and Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*.

numerical tables and confirmed with qualitative interview data. In addition, statistical analysis was utilised to confirm the findings. In the tables, percentages were used as they clearly demonstrated the responses. The findings are presented in the sections below.

Technological Content Knowledge (TCK)

This section depicts findings of Technological Content Knowledge, which was selected to measure teachers’ knowledge of ICT integration in teaching Accounting. This element consists of four items on teachers’ knowledge of the new technologies and skills required to integrate ICT into the Accounting curriculum. A Likert Scale of strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree was also included for respondents to rank their knowledge of technology and content. Interviews were added to supplement the quantitative results. Statistical analysis was also used to confirm the findings.

Table 1A: Technological Content Knowledge (TCK) items

		Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1A:1	I can learn technology easily.	1.6	19.4	8.5	48.8	21.7
1A:2	I keep up with important news about technologies.	13.2	60.5	3.9	21.7	0.8
1A:3	I have the technical skills I need to use technology.	7.8	58.9	4.7	27.9	0.8
1A:4	I use the technologies to develop learning activities and learners’ tasks.	1.6	14.7	9.3	69.8	4.7

Table 1 above lays out findings on how participants comprehend technology and content. Over 60% of participants acknowledge that they do not keep up with important news about technologies because they have little knowledge. Further, 58.9% of participants felt that they did not have the technical skills needed to use technology. However, above 60% of participants showed they could use the technologies to develop learning activities and learners’ tasks. During the interviews, participants indicated that they know about a few technologies they usually use, such as laptops and printers. Participants alluded that what they know is preparing activities and documents for teaching and learning, not the actual integration. Participants also disclosed that they possess moderate skills in using technology. Nevertheless, participants affirmed that they will not struggle to learn about technology integration. The participants who disagreed stated that a lack of personal technical gadgets is the reason why it won’t be easy to learn technology. Teacher 8 commented:

“I don’t have much knowledge about ICT tools. To be honest, I know the tools by seeing them and doing the basics of typing and printing, so I do know about full integration. But I believe I can learn technology easily because we have had technologies such as smartphones and tablets that were introduced to us, and we managed to master them.”

Participants disclosed that they have more traditional teaching skills than technical skills to deliver the accounting content. Many of them alluded that they have basic technical skills. Statistical analysis showed the following results:

Table 1B Comparison of Male and Female Accounting Teachers on Technological Content Knowledge (n = 83 females, 46 males)

Variable	<i>M</i>	<i>SD</i>	<i>T</i>	<i>Df</i>	<i>P</i>	<i>MD</i>	<i>CI</i>	<i>D</i>
Technological Content Knowledge			-0.51	127	0.61	-0.23	-0.10 to 0.65	0.00
Females	12.14	2.24						
Males	12.37	2.68						

In the second table above, the Technological Content Knowledge independent variable indicates no statistically significant difference in the results of female and male Accounting teachers' comprehension. Female teachers reported $M = 12.14$; $SD = 2.24$ and males $M = 12.37$; 2.68 . For both genders ($df = 127$, $t(127) = -0.51$; p -value < 0.61 and $MD = -0.22$). The Confidence Interval (CI) ranged between -0.10 to 0.65 and Eta Squared was scored at 0.00 . Since the analysis of the confidence interval reveals that the interval includes 0 (zero), it can be concluded that there was no statistically significant difference between the two groups of Accounting teachers in this study. Further, the null hypothesis is accepted, whereas the alternative hypothesis is rejected. The next theme measured teachers' technological understanding in teaching accounting.

Technological Pedagogical Knowledge (TPK)

This section presents findings on teachers' knowledge of technologies in instructional practices, adapting to the use of technologies in instructional practices and the use of strategies that combine content, technologies, and instructional approaches. Respondents were requested to indicate their responses on a Likert Scale of strongly disagree, disagree, neither disagree nor agree, agree and strongly agree. They were also asked about this during the interview to confirm the findings.

Table 2A: Technological Pedagogical Knowledge (TPK) items

		Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
2A:1	I can choose technologies that enhance the teaching approaches for a lesson.	0.8	30.2	3.9	62.0	3.1
2A:2	I can choose technologies that enhance learners' learning for a lesson.	0.8	29.5	4.7	60.5	4.7
2A:3	I can select technologies to use in my classroom that enhance what I teach, how I teach, and how learners learn.	0	33.3	3.9	58.9	3.9
2A:4	I can use strategies that combine content, technologies, and teaching approaches that I learn about in my coursework in my classroom	3.1	34.9	7.8	51.9	2.3

The findings above indicate that a high number of participants concur that they can select technologies to enhance teaching approaches in the lesson (62% agreed). Participants were asked how they selected those technologies and how those technologies enhanced their teaching approaches. They alluded that they select technologies according to the topics they are teaching and the availability of the technologies in the school. In a follow-up on selecting technologies and combining them into their teaching, teachers mentioned downloading teaching materials, printing and photocopying. No integration was mentioned in the actual teaching. The technologies they reported choosing most

frequently were calculators, laptops, smartphones, tablets, and printers. One teacher commented that he uses TikTok to incorporate technology in his teaching of Accounting. Participants disclosed that they can choose the technology that will align with content teaching; however, they cannot successfully understand it. Another concern from participants was that they could only choose the technologies available in their schools.

One participant indicated that she has a small number of 33 learners, so she normally groups learners to watch content on laptops. She disclosed that learners work well together, especially if you use a unique teaching style. Another participant reported that her technology is a calculator, and she integrates it into every day of her teaching in any teaching approach. Teacher 10 had this to say:

“Personally, I feel we are capable of choosing the technologies in Accounting for teaching, but we don’t have the appropriate resources for exact implementation. I always try to use the ones that are available in my school, which include a few laptops and computers. I use visuals and online documents such as question papers, memoranda and answer books. These technologies enhance my teaching approaches as learners can relate what is in the textbook with what is currently happening in the real world. In other words, they construct advanced knowledge.”
(Teacher 10)

Smartphones and the Internet are highly rated technologies that teachers use to enhance learners’ learning. Participants alluded that the Internet assisted learners in exploring more information on each topic being taught. Some participants mentioned that under challenging topics, they would use the Internet to enhance learners’ learning, for instance, by giving them projects and assignments requiring them to search and discover more information on the topic. Teacher 1 remarked:

“I normally use my laptop, the internet and the projector for PowerPoint occasionally because we don’t have all the required resources. The Internet also assists with videos during teaching and learning to enhance learners’ understanding; my lessons would be well delivered, and I realised that my learners were becoming active and collaborative”.

Teacher 10 also said:

“There is a colleague we used to work with, but he is far so sometimes he will make video conferences on certain topics where he would be teaching my learners. In that way, learners’ learning is enhanced as they see a different learning method. We normally use a small computer laboratory”.

The findings above were confirmed by statistical analysis, which is outlined below:

Table 2B Comparison of Male and Female Accounting Teachers on Technological Pedagogical Knowledge (n = 83 females, 46 males)

Variable		<i>M</i>	<i>SD</i>	<i>T</i>	<i>Df</i>	<i>P</i>	<i>MD</i>	<i>CI</i>	<i>d</i>
Technological Content Knowledge				-0.51	127	0.61	-0.23	-0.1.10 to 0.65	0.00
	Females	12.14	2.24						
	Males	12.37	2.68						

Table 2 above still indicates that the population consists of 129 Accounting teachers of two groups (females and males). For females, scores were indicated as follows (*M*=23.54; *SD*=4.95) while males’ scores were (*M*=23.69; *SD*=4.83). *T*=0.88; *p*-value scored <0.88 and the mean difference between these teachers was -0.13. The effect size was very small (Eta Squared = 0.00). The Confidence Interval and ATE Squared scores reveal that there is no statistically significant difference between the Accounting teachers; therefore, the null hypothesis is accepted, whereas the alternative hypothesis is rejected.

DISCUSSION

The findings of this study show that Accounting teachers possess a moderate understanding of Technological Content Knowledge. Siyaya confirmed the above findings by positing that Accounting teachers do not know much about technology tools that could enhance learners' understanding of Accounting content, even in forever-changing times.³⁴ Although Accounting teachers have the ability to utilise the technologies to develop learning activities and learners' tasks, during the interview with the participants, they mentioned that they lack some skills related to Technological Content Knowledge. Manhibi, Ndlovu and Siyaya supported this finding by maintaining that teachers' technological content knowledge is lacking; hence, training must focus on enabling teachers to combine technology and content knowledge.³⁵ Rambrij outlined that a lack of Technological Content Knowledge is problematic since this knowledge can create new representations for specific content.³⁶ The latter found that even teachers who teach Technology as a school subject lack technical knowledge. The intention is to train teachers to know what technologies to use with certain pedagogical strategies.

In this study, findings showed that teachers in Accounting are moderately knowledgeable about combining technology and teaching strategies to influence teaching and learning. Teachers mentioned that their choices are dependent on the technologies that are available and accessible to them in schools. Mudrikah et.al. supported the above findings by indicating that Technological Pedagogical Knowledge (TPK) concentrates on how various technologies can be selected in teaching and learning and understanding that using technology can change how teachers teach.³⁷ Teachers normally select technologies such as smartphones, laptops, tablets, computers, printers, and copier machines to enhance teaching and learning in their lessons. In addition, WhatsApp social media was mostly used to support Accounting teaching. Teachers downloaded the WhatsApp application on their smartphones and tablets. A few teachers acknowledge using technology platforms such as Facebook, Messenger, YouTube, electronic books, and TikTok to improve their instructional practices. According to Kaarakainen, Saikkonen and Verma et.al., digital devices help increase the accessibility of educational applications and downloadable mobile applications provide an abundance of possibilities for educators and learners to use.³⁸

Teachers mentioned that they are not informed about technologies that are directly designed for teaching the Accounting subject matter, such as software. Evidently, they cannot integrate various Accounting software to enhance their teaching and learners' learning. They have never done it before. These findings are supported by Kiru, Kwarteng, and Siyaya, who allude that in South Africa, there is no Accounting software available in secondary schools.³⁹ Even Accounting courses in higher education have limited software. Amory et. al. confirmed the above findings by indicating that the majority of Accounting schools across the world continue to provide their teaching without the assistance of Accounting software.⁴⁰ Further, schools continue to practice with paper and pen, which limits teachers'

³⁴ Siyaya, "Factors Influencing Learner Performance in the Economic and Management Sciences in the Ilembe District."

³⁵ Vusumuzi Prince Ndlovu, "Exploring Grade 9 Teachers' Experiences of Enacting Financial Literacy/Accounting in the Zululand District=Ucwaningo Ngokwehlela Othisha Bebunga 9 Ekufundiseni Ifinancial Literacy Ne-Accounting EZululand District" (University of Zululand, 2022); Manhibi, "Information and Communication Technologies Integration into Early Childhood Development Education in Masvingo Province, Zimbabwe: A Critical Analysis"; Siyaya, "Factors Influencing Learner Performance in the Economic and Management Sciences in the Ilembe District."

³⁶ Rambrij, "Technology Literacy for Teachers in Rural Schools : Constructing Key Concepts in Technology Education for Teachers in the Ilembe District."

³⁷ Saringatun Mudrikah, Jarot Santoso, and Dwi Astuti, "Exploring the Technological Pedagogical and Content Knowledge (TPACK) of Vocational High School's Accounting Teachers," in *Proceedings of the 3rd International Conference on Economics, Business and Economic Education Science, ICE-BEES 2020, 22-23 July 2020*, (Semarang, Indonesia: EAI, 2021), <https://doi.org/10.4108/eai.22-7-2020.2307933>.

³⁸ Meri-Tuulia Kaarakainen and Loretta Saikkonen, "Multilevel Analysis of the Educational Use of Technology: Quantity and Versatility of Digital Technology Usage in Finnish Basic Education Schools," *Journal of Computer Assisted Learning* 37, no. 4 (2021): 953–65; Chaman Verma, Sanjay Dahiya, and Yogesh Kumar Sharma, "An Empirical Study of Outlook Difference among Indian Students towards ICT for Demography and Educational Standards," *International Journal of Engineering Technology and Sciences* 3, no. 2 (December 30, 2016): 54–63, <https://doi.org/10.15282/ijets.6.2016.1.8.1058>.

³⁹ Kiru, "Mathematics Teachers' Use of Information and Communication Technologies: An International Comparison."; Joseph Tufuor Kwarteng, "Degree of Senior High School Accounting Curriculum Implementation in Ghana: Relevant and Problematic Topics," *MOJES: Malaysian Online Journal of Educational Sciences* 7, no. 3 (2019): 1–11; Siyaya, "Factors Influencing Learner Performance in the Economic and Management Sciences in the Ilembe District."

⁴⁰ Amory, Rahiman, and Mhlanga, "Rapid Research on the Use of ICT in Education."

and learners' understanding and practice of relevant accounting software. It is evident that very few frequently integrate technology in their teaching by giving learners technology-based activities, monitoring their progress, covering curriculum content, and fostering collaboration in teaching and learning.

RECOMMENDATIONS

Primarily, teachers' understanding of any transformation in the education sector depends on how well teachers are continuously being empowered. For Accounting teachers to be well informed and to successfully implement ICT integration within the subject, the DBE should initiate professional development programmes. Programmes should concentrate on training teachers in practical ICT integration. In other words, programmes should be more practical than theoretical. Teachers should be taught how ICT tools are used to deliver the accounting curriculum, not the basic skills teachers possess. The focus should be on ensuring that teachers are digitally literate while they are in the classroom rather than just when they are preparing lessons. The current digital era, globalisation, 4IR, the nature of Accounting subjects and the profession mandate the government to prioritise teachers' development in infusing ICT in the classroom to equip learners. The argument is that professional development should occur urgently for teachers to develop professional competence with ICT integration.

CONCLUSION

The findings of this study have highlighted that Accounting teachers' knowledge of the integration of ICT in teaching Accounting remains minimal. Although teachers use some technology resources in their teaching, such as smartphones, tablets, laptops, printers, and photocopier machines, they are not informed about using these resources directly for teaching. They use them to prepare lessons and enhance content understanding. For instance, using digitals and the internet to search for educational resources. In other words, teachers' knowledge of ICT integration remains inadequate since they are aware of ICT integration in schools but do not implement it for some reason. The reasons are viewed as impediments for teachers to understand ICT integration in Accounting sufficiently.

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