

Modernised and technological teaching freedom in South African public township schools

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Abstract

Pedagogical freedom without the integration of educational technologies is obsolete in this constantly evolving educational landscape. This 21st century requires for teachers to adapt to technology-enhanced teaching and demonstrate the freedom of using the technologies for instruction and overall curriculum delivery. This study investigated how teachers employ technology enhanced teaching in selected township public schools in South Africa. This study followed a quantitative research approach and utilised the questionnaire to collect data. Descriptive statistics were used for quantitative data analysis. Purposive and convenience sampling was used to select 27 schoolteachers in selected public township schools. The results of the study show that there is a great gap between available Information and Communication Technology tools and their effective use in township schools. As a result, the study concluded that teachers were unable to fully utilize technological resources in their teaching practices. Therefore, this study recommended four strategic practices for effective integration of Information and Communication Technology in teaching and learning. This study provides valuable insights that will assist teachers, principals, and policymakers to innovate and improve school education.

Keywords: ICT tools; Technology-enhanced teaching; Technological teaching freedom

INTRODUCTION

Technological teaching freedom happens when a teacher is able to integrate digital technologies into their pedagogy without restrictions. It is an evolution of traditional academic freedom, adapting to an era where technology plays an increasingly significant role in the learning environment (Il'ko et al., 2025). Likewise, most South African public schools' classrooms are now operating using technologies and traditional teaching methods for curriculum delivery. This is supported by several studies that looked into the viability of educational technologies in delivering instruction and curriculum. For example, Ndlovu and Mtshali (2025) observed the adoption of tablets and their impact on mobile learning; and discovered that teachers in South African classrooms are accepting of the new technologies which are there to reduce the weight of carrying textbooks into classes (Department of



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Education, 2004). Nkosi et al. (2025) observed that some teachers had form professional learning communities to equip each other on how to effectively use various educational technologies in their classrooms. These findings indicate a shift in pedagogical approaches instigated by technological advancements and a call for teachers to adapt their instructional practices.

Previous studies have shown that educational technologies can improve learner engagement and achievement. However, however challenges related to teacher preparedness, infrastructure, and classroom implementation continue to limit effective technology integration in South Africa. In township schools, technology-based teaching is viewed as vital for equipping learners with 21st century skills (Mzimela et al., 2024). The rise of technology-based teaching in schools has marked a significant shift in educational methods and outcomes (Gadzali, 2023). Research indicates that technology enhances educational practices in schools (Xu et al, 2023). For instance, Khubayi et al. (2024) investigated the effectiveness of using YouTube videos as an alternative learning media in a Grade 11 classroom. These scholars found that learners who received instruction through YouTube videos achieved notably higher scores compared to those instructed through traditional lectures, a demonstration of a need for a technological classroom. Yet, the technology-enhanced teaching is not widely practiced in South African schools.

Despite increased access to Information and Communication Technology (ICT) tools, the levels of ICT integration in teaching and learning remain low in public schools. The department of basic education (DBE) made ICT integration in education its deliberate strategy in 2004. According to Department of education (2004:3), the whitepaper on e-education sets out the government's response to a new technology environment in education. The challenge of providing modern technologies to schools to enhance the quality of learning and teaching will require a significant investment (Gcabashe & Ndlovu, 2022). Given the opportunities of the task ahead, the public and the private sector should join hands to ensure that children receive high-quality learning and teaching (DBE, 2004). However, notwithstanding the recognized transformative potential of ICT in education, many schools, particularly in rural areas and townships, lack essential resources such as reliable electricity and internet access (Macfarlane, 2024; Barakabitze et al., 2019). Research indicates that even among schools equipped with ICT resources, instructional use remains sparse, predominantly due to inadequate support systems and financial limitations that restrict schools from investing in essential technology, thereby widening the existing education gap (Barakabitze et al., 2019). Therefore, resource provision is not sufficient to address the challenge of lower technology integration and there is a need for improving teacher readiness and technology competencies.

Poor teacher preparedness significantly contributes to the low levels of ICT integration. Many teachers lack the necessary skills and knowledge for effective ICT use in teaching (Filita & Jita, 2022; Mwapwele et al., 2019). Insufficient teacher training is a recurring theme; findings indicate that only a small percentage of teachers have access to training focused on integrating ICT into their teaching practices, with less than 20% of South African mathematics teachers having received related professional development (Leendertz et al., 2013). This lack of preparation hampers teachers' willingness to utilize ICT tools and adversely affects students' learning experiences (Mirzajani et al., 2016; Harrell & Bynum, 2018). This highlights a need for more context-based research that address problems faced by schools located in challenging contexts such as rural areas and township schools.

This study aims to investigate how teacher utilize educational technologies in township public schools and to identify strategies that can support effective technology-enhanced teaching. The study proposes four strategies for technology enhanced teaching in public schools. The mixed method approach was employed with 27 participants. The novelty of this study lies on its focus on township schools where learner enrolment is high compared to rural and suburb schools. It is expected that because of high learner enrolment and habitual class overcrowding, teachers could make means to use educational technologies to reach out to all learners during their lessons. Besides,

METHOD

The quantitative research approach with descriptive survey design was followed to collect data. The purpose of this study is to investigate the use of educational technologies in township schools. The researchers utilized the descriptive survey design to collect data from participants using questionnaires to describe behaviours of teachers regarding their use of digital tools to enhance teaching and learning. The participants consisted of 27 primary school teachers in Soshanguve. They voluntarily completed the questionnaires. All of the samples were teaching grades 4-7 in primary schools, and each had a Bachelor of Education degree. The participants had the same hierarchical structure, which makes no formal distinction between the teachers' duties and position in school.

The questionnaire was divided into two sections; the first section is for the respondents' biographical details. The second section contains two sets of structured questions (adapted from [Padayachee, 2017](#)). The first set of structured question was based on the scale of digital tools which comprised of 40 items regarding the frequency of use of several digital tools (mobile learning tools, websites, social media, etc.). These items were assessed by means of five-point Linkert-scales (1=several times daily...5= never). The second set of structured questions also consisted of 40 items was based on the subjective benefits of digital tools. These items were also assessed by means of a five-point Linkert-scale (1= very useful...5= not useful at all).

Data collection was conducted through random distribution. Researchers provided the survey questionnaire to primary school teachers they encountered at the school without any prior arrangement. The researchers managed the distribution process. Concurrently, the survey questionnaires were also emailed to primary school teachers. After the survey was distributed, participants were given three days for hand distribution and one week for email to complete the survey. Once the participation deadline passed, researchers combined raw data for data analysis.

This study analysed each question individually, considering all relevant factors based on descriptive analysis. The data was structured using a spreadsheet containing 40 digital tools adopted from [Padayachee \(2017\)](#). The relative usage and significance of these digital tools were documented in the spreadsheet, and the information was subsequently converted into graphical representations. Raw data was categorized by activity type: 1) Sharing information tools, 2) Experiential tools, 3) Reflective dialogue tools, and 4) Contextual tools, to achieve a more profound understanding of the category of digital tools utilized for the integration of technology into teaching and learning.

The assessments for validity encompass both face validity and content validity ([Bless et al. 2013](#)). Content validity refers to the principle that a test ought to encompass the full spectrum of behaviour represented by the theoretical concept being evaluated ([Fouché & Bartley 2011](#); [Rubin & Babbie, 2005](#)). Face validity was achieved by ensuring that the test

measured what it is intended to measure (Monette et al., 2008). Regarding content validity, the survey items pinpointed specific ICT technologies that teachers might potentially utilize. To guarantee content validity, the final survey was examined for clarity and alignment with research objectives by a subject matter expert. However, the survey created for this research is a synthesis of existing instruments; therefore, it has been validated by prior researchers.

RESULTS AND DISCUSSION

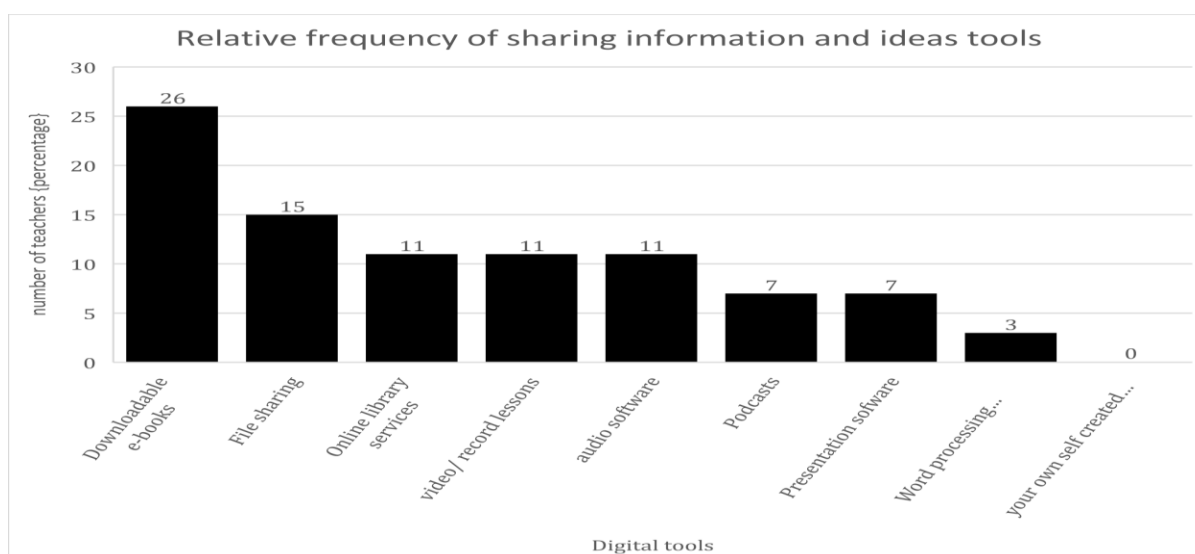
The main aim of this study is to investigate how teachers utilise technology in their teaching and learning processes. In order to determine how teachers integrate ICT into teaching and learning; quantitative measures were implemented. Twenty-seven teachers of varying subjects but whom all teach at grade 7 at Tshwane North primary schools completed a questionnaire designed to determine the ICT tools they use. The questionnaire also consisted of the biographical section to gather precise information about the participants; this included age, gender, and qualification. The collected data was organized by activity type: 1) experiential tools; 2) contextual tools; 3) sharing information and ideas; and 4) reflective dialogue. This made it possible to link the what and the how of the technology used. To obtain a deeper understanding of the category of tools used the data is organised in graphs for each category of tools.

Sharing information and ideas tools

A significant aspect of the teaching profession involves disseminating information and ideas to enhance learners' comprehension of the world. With ongoing research across various fields and disciplines, information is perpetually expanding and evolving. This necessitates that educators act as scholars, consistently pursuing knowledge pertinent to their subject areas, as well as exploring improved teaching methodologies and sharing these insights with one another. The tools for sharing information and ideas serve as vehicles for the exchange of knowledge.

Figure1

Relative Frequency of Sharing Information and Ideas Tools



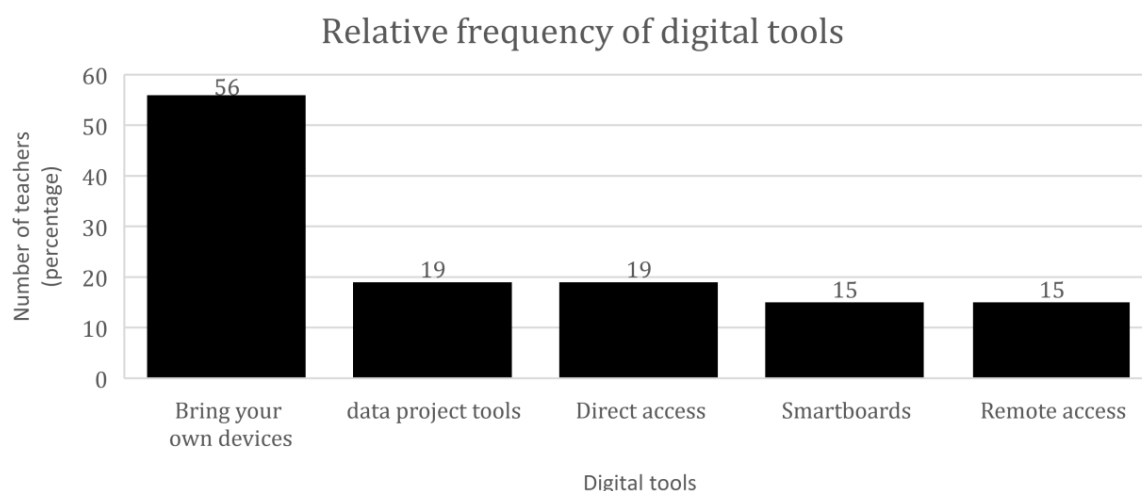
The data shows that the usage of sharing information and ideas tools is very low. The most used tools in this category are downloadable e-books which are used by 26% of the teachers. Other tools are almost not utilized. Audio software, online library services, video/record lessons are used by 11% of the teachers, whereas self-created websites are at 0%. The sharing information and ideas tools facilitates the interrelations between various stakeholders including teachers, principals, students, and parents. The use of technology for communication between schools and parents has been shown to bridge information gaps, thereby promoting parental involvement in the educational process (Howal, 2022; Pöntinen et al., 2023). Gonzalez-Dehass et al. (2022) highlights that this involvement is crucial for reinforcing positive disciplinary strategies between home and school, contributing to the holistic development of children. Supporting this notion, Husnita et al. (2022) argue that teachers need to be equipped with digital communication skills to foster parent-teacher partnerships, thus emphasizing effective communication as one of the essential competencies of modern educators. Poor utilisation of information sharing tools reflects a gap in effective use of ICT particularly in schools located in challenging contexts.

Contextual tools

Contextual tools are not designated for a particular type of activity; rather, they facilitate a range of activities (Padayachee, 2017). This encompasses tools like data projectors, personal devices (such as smartphones and tablets), and remote access to electronic resources, which pertains to utilizing electronic resources through computer networks. Interactive whiteboards can be employed to access the internet, save information for future reference, conduct presentations, and engage in various other activities. The graph below illustrates the relative frequency and significance of contextual tools.

Figure 2

Relative Frequency of Contextual Tools



The data indicates lower substitution levels for contextual tools except for bringing your own devices. Interactive whiteboards and remote access electronic resources are used by 15% of the teachers, whereas only 19% use direct access electronic resources. On the other hand, there is improvement in the use of bringing your own devices which are used by 56% of the teachers. These findings align with research that indicate insufficient resources to support ICT integration in township schools. The digital divide significantly undermines educational equity in disadvantaged South African schools, as highlighted in a study of three

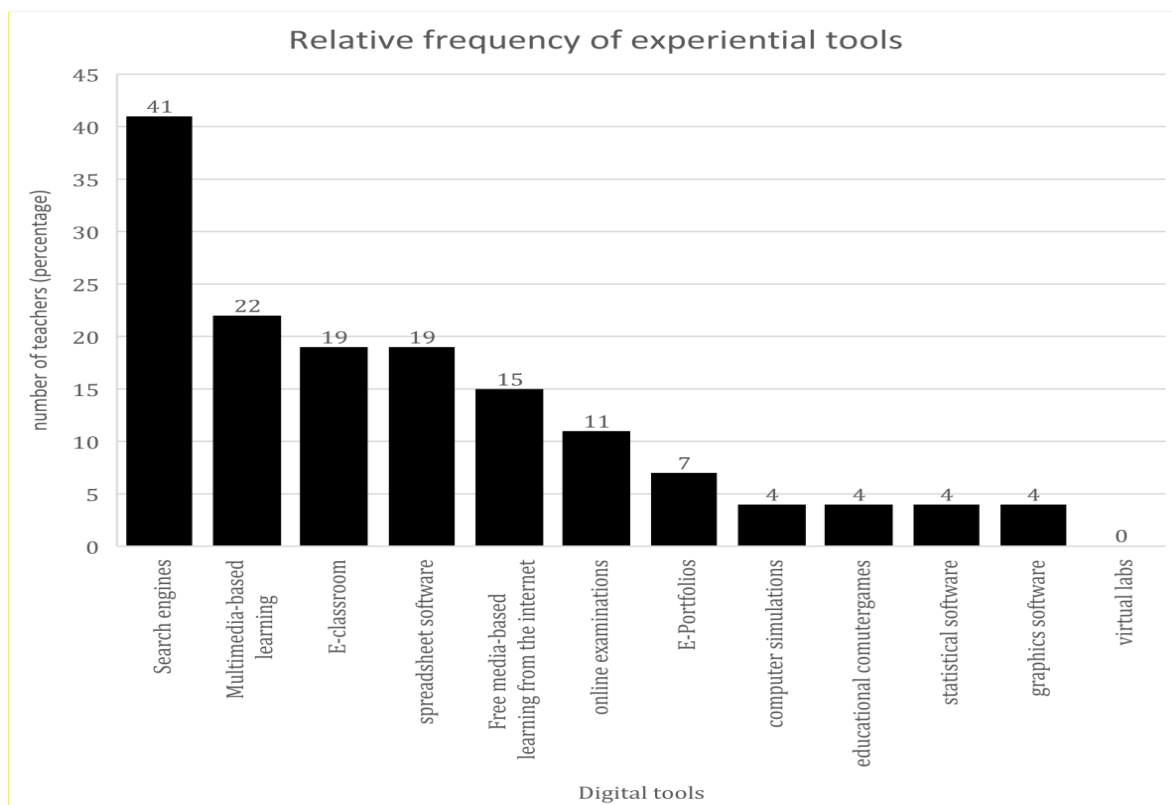
secondary schools in Gauteng 12. Inadequate ICT infrastructure, limited internet access, and a lack of digital skills among teachers and learners exacerbate existing inequalities (Kumi-Yeboah et al., 2023; Badiuzzaman, 2021). Thus, there is a need for provision of more ICT tools in township schools.

Experiential tools

Experiential tools denote the digital resources that allow learners to perform, observe, or otherwise participate in enriching learning experiences without the direct involvement of the teacher (Mnisi et al., 2024; Padayachee & Mbat, 2016). Despite significant investments aimed at promoting the integration of ICT within the classroom, the majority of teachers are not fully utilizing such educational technologies (Mirzajani et al., 2016). The inadequate levels of integration of experiential tools reinforce this claim. While technology can facilitate the sharing of information, it can also be employed to engage in activities that necessitate higher-order thinking and assist learners in developing problem-solving abilities (Kumar, 2024). For instance, learners can utilize computers to engage in games that involve solving puzzles, which in turn aids them in effectively addressing math problems. Therefore, experiential tools are vital for developing creativity, critical thinking and problem-solving skills among students. The subsequent graph illustrates the number of teachers who utilize experiential tools and the number who consider them beneficial.

Figure 3

Relative Frequency of Experiential Tools



The reduced levels of substitution for experiential tools suggest that numerous learners are not reaping the benefits of technology's positive impacts. Consequently, the diminished use of technology today can be viewed as a form of inefficiency. In this modern era, the capability to access information is a crucial skill. Traxler (2018) asserts that mobile devices

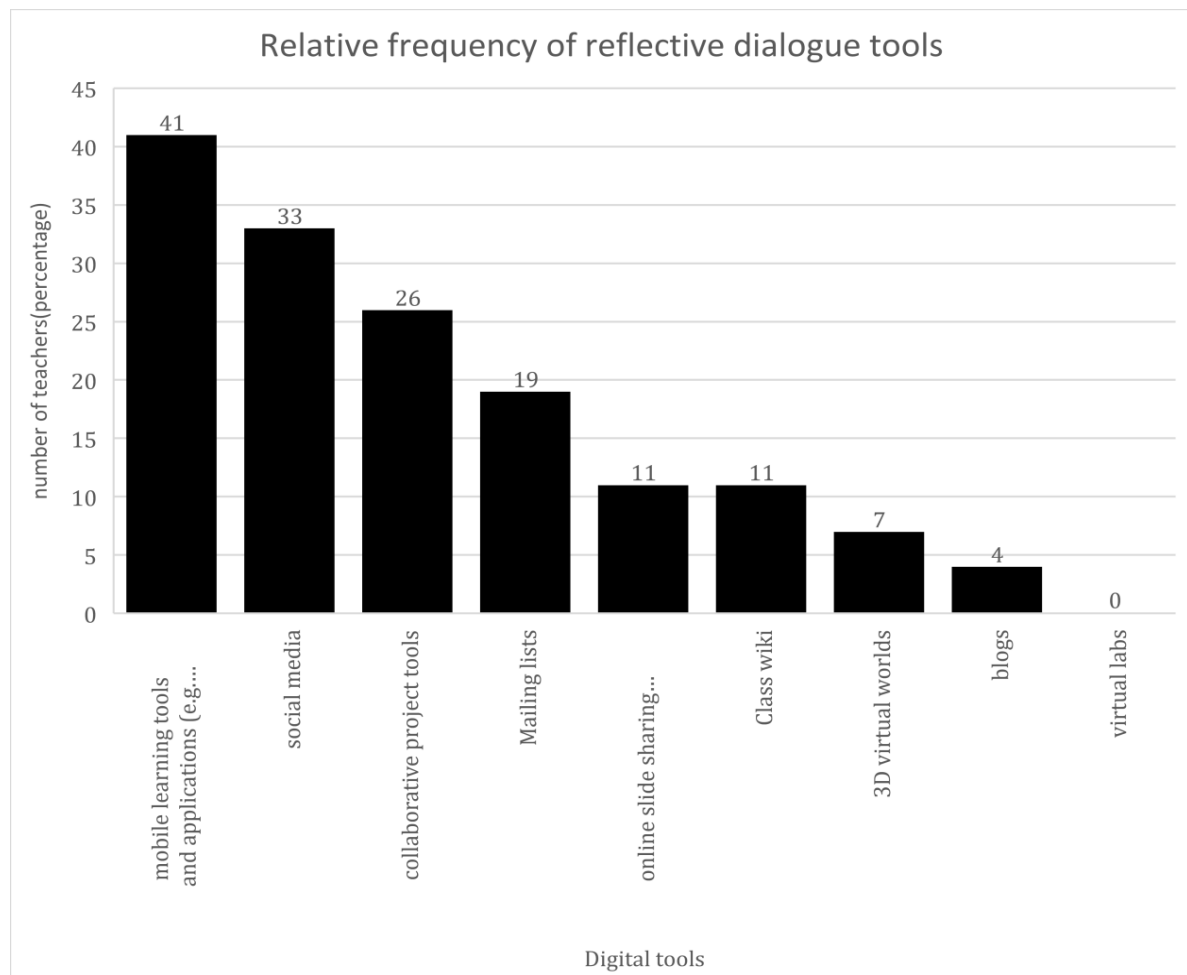
allow students to consume, that is, to access and store nearly all types of knowledge almost instantaneously and from virtually any location, with minimal effort compared to previous technologies. If technology proves to be advantageous for teaching and learning, it is essential for educators to adopt it.

Reflective dialogue tools

Effective teaching necessitates reflection; therefore, educators must contemplate their methods to enhance their instructional practices. As an educator, it is crucial to evaluate the teaching process to ascertain whether the intended educational objectives were met. It is essential to identify what was accomplished and what was not, as well as to explore ways to enhance the overall teaching process. Reflective dialogue tools serve as instruments for self-reflection or collaborative discussions regarding the subject matter and the learning experience. The graph below illustrates the relative frequency and significance of digital tools.

Figure 4

Relative Frequency of Reflective Dialogue Tools



Despite the growing availability of technology in educational institutions, educators are often depicted as reluctant users (Harrel et al., 2018). They tend to be familiar with

traditional methods, which can lead to frustration when attempting to transition to a new paradigm, causing them to distance themselves from utilizing 21st-century technological devices. This claim is somewhat corroborated by the lower levels of substitution for digital devices. Educators reported a reduced use of reflective dialogue tools compared to the other three categories of digital tools. The most frequently utilized reflective dialogue tools are mobile learning tools and applications, such as WhatsApp, which are used by 41% of teachers. In contrast, blogs represent the least utilized reflective dialogue tools, with only 4% usage. The graph below illustrates the usage of reflective dialogue tools

CONCLUSION

This study investigated how teachers in township schools utilize digital technologies in teaching and learning. Despite increased access to ICT tool evidence about their impact on teaching and learning, there is a significant gap between effective use of these tools and how they are currently employed in public schools. The findings of this study reveal that teachers are only familiar with relatively few digital tools and are unfamiliar with a variety of digital tools that can enhance the quality of teaching and learning in these schools. Consequently, there is low integration of technology in township schools. Essentially, this study revealed a link between technology use and crucial teaching and learning dynamics that can be improved through strategic integration of ICT. *First*, sharing information and ideas tools support stakeholder engagement which is associated with increased learner motivation and achievement. *Second*, contextual tools contribute to increased classroom engagement by making lessons more concrete. *Third*, experiential tools improve critical thinking and problem-solving skills as they enable learners to work on their own and construct their knowledge as they explore and solve problems independently.

Finally, reflective dialogue tools provide teachers with crucial information to improve their practices by giving them constructive feedback. By revealing current state of teachers' familiarity and use of digital tools the findings of the study contribute to the body of knowledge dedicated to improving ICT integration in township schools and addressing challenges faced by township schools. However, this study comprised of relatively small sample size and focused on one region. Therefore, future studies may explore technology integration across different educational contexts using larger samples and mixed-method approaches.

Based on the findings of this study we recommend that the department of basic education, school leaders, and policy makers, develop a contextual ICT integration program focused at improving teachers' knowledge and skills regarding the various ICT tools and their applications, promote the use of technology to enhance stakeholder engagement, provide contextual tools to improve classroom interaction and engagement, and encourage utilization of experiential tools to improve students' critical thinking and problem-solving skills and use of reflective dialogue tools to promote a culture of continuous learning.

AUTHOR CONTRIBUTION

Mzimela, A came up with the presented idea and collected the data in the schools. Whereas Mtshali, TI supervised the findings of this study. Both authors discussed and contributed to the final manuscript.

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