

Grade 9 teachers' experience of digital technologies in the classroom

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ABSTRACT

The use of digital technologies in the classroom has escalated, especially during the COVID-19 pandemic. Although technology and teacher development centres are available for teachers to use, they are often not optimally utilised. This study used explorative qualitative case study methodologies to understand Grade 9 teachers' use of digital technologies as they integrate it into their lessons and classrooms. Seven teachers were purposely selected to be sources of data collection. Framed by the Technological Pedagogical and Content Knowledge (TPACK) framework, data was generated using semi-structured interviews to explore the Grade 9 teachers' experiences and views on the integration of digital technology post the outbreak of the COVID-19 pandemic. To analyse the data, a thematic analysis was conducted. Although the findings show limited digital technology integration, some teachers are found to be using videos, projectors, and laptop computers in their classrooms. Inadequate infrastructure and lack of support contribute and impact teachers' experience of integrating digital technology in the Grade 9 classroom.

Keywords: COVID-19 pandemic, digital technology integration, rural schools, teacher experience, technology knowledge

Categories: • *Applied Computing ~ Education, e-Learning*

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1 INTRODUCTION

The 21st century is characterised by irresistible emerging technologies and more significantly, has seen dramatic changes in the education system across the globe (United Nations, 2021). These changes in education are mirrored in the amount of digital technology that has infiltrated education, hence, as a branch of knowledge construction, education needs to be redesigned to make provision for the challenges brought by these emerging digital technologies (Ganimian et al., 2020).

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While the use of digital technologies has resulted in large scale transformation in education across the globe, teachers as leaders in the teaching and learning environment (Collie et al., 2018), emerged as one of the main role players and role models to deliver education both in- and outside of the classroom (Hicks, 2011). With so much exposure to the 4IR digital technology, teachers hardly have a choice other than to embrace the new technology and facilitate interactive teaching and learning to 21st century learners (Abukhattala, 2016). When teachers experience a sense of achievement and satisfaction while using digital technologies, they become more attracted to the continuous use of digital technology (Chigona, 2018). The use of digital technologies not only influences teachers' pedagogical approaches, but also has a positive impact on the achievement of learning outcomes (Chandra & Mills, 2014).

As the use of digital technologies in the 21st century is expanding, opportunities are created to deliver an interactive learner-centred approach to education (Fransson et al., 2018), utilising the affordances of digital technology. The current education system promotes the use of digital technologies where teachers are enabled to support learners from diverse backgrounds (Van Greunen et al., 2021). Therefore, all teachers need to be familiar with these digital technologies to integrate them into their classroom activities or lessons, moreover, keep up to date with new developments in digital technologies.

Researchers have reported many benefits based on the use of digital technology over the past years (Abukhattala, 2016; Azmi, 2017; Nikolopoulou, 2020). For example, when English language teachers integrate digital technology into their lessons, learners are motivated, engaged and enjoy the classes; hence the learning is enhanced and it boosts autonomous learning (Abukhattala, 2016; Azmi, 2017). Similar results were reported in a prior study (Nikolopoulou, 2020) which added that learners also have easy access to information when using digital technology.

Further studies report that insufficient facilities either discouraged teachers to use digital technology or forced them to buy their own resources (Abukhattala, 2016; Nikolopoulou, 2020). Since all teachers are not computer literate, it makes the adaption to the utilisation of digital technology to prepare lessons time-consuming (Abukhattala, 2016; Hill & Uribe-Florez, 2020; Hyndman, 2018), where another study found that experience, age, and gender were not deciding factors as to whether teachers will use digital technology or not (Abukhattala, 2016). Thus, for this study the purpose was to explore how teachers experience the integration of digital technologies in Grade 9 classes, while being challenged to continue with teaching and learning during the COVID-19 pandemic.

2 BACKGROUND

Although investment in digital technology has increased dramatically over the past two decades (Lim et al., 2013), concerns exist regarding benefits and the return on investment. According to Lim et al. (2013), a gap exists between schools having digital technologies and the actual use of the technologies. In South Africa, the scenario is not much different from what was observed in Lim et al.'s (2013) study. Since the South African Department of Basic

Education has embarked on various projects to dispatch digital technology, such as interactive whiteboards (Ngcume, 2021), laptops (Macupe, 2017), and tablets to schools in the various provinces (Govender, 2021), a common trend emerged that irrespective of training been given, albeit limited, technology is not optimally utilised (Mihai, 2020).

The onset of the COVID-19 pandemic caught many schools off guard as schools needed to close and adapt to remote teaching (Winter et al., 2021). Several challenges such as security of devices, teacher student ratio, electricity (load shedding), the lack of training on how to use digital technology effectively as teaching and learning tools, amplified the reality of not being able to implement remote learning (Schleicher, 2020). All countries managed to implement some form of remote learning in their educational programmes during the COVID-19 pandemic (The World Bank, 2021). Technologies such as TV, radio, and online and mobile platforms were deployed with mixed success. For example, some learners in low-income countries or poor socio-economic home surroundings could not participate in these remote learning strategies, resulting in more than 50% of the learners in these areas missing out on learning activities. While the pandemic magnified the digital inequalities (Du Preez & Le Grange, 2020; The World Bank, 2021), there were attempts to lessen the digital divide and suggestions made that focus should be placed on three areas, namely infrastructure, human resources, and logistical and administrative systems. This article focuses on the second area, with particular focus on teachers' experience of integrating digital technologies to deliver lessons.

During COVID-19 teachers continued to struggle to adapt to the digital technology integration (Akram et al., 2021). To assist teachers in using digital technology in a pedagogically sound way, the focus in this study is on how teachers' experience digital technologies to deliver lessons. The secondary schools used in this study are situated in rural areas within the Bojanala District, North West province, in the Dinaledi cluster. Due to limited digital technological equipment at the selected secondary schools, a computer laboratory was built at the Teachers Development Centre, located in one of the villages in the district, for teachers and learners to make use of. For the schools to have access to quality education and ICT infrastructure, the computer laboratory manager trains teachers on issues related to digital technologies used in teaching and learning, when the need arises. Although the computer laboratory can be used, the geographical location of schools hinders teachers from implementing what they have learned during the training in the computer laboratory because of the lack of digital devices and Wi-Fi at their schools.

This study forms part of a greater research project where the application of the TPACK framework and each component will be applied. Through the three years of the research project, the TPACK framework and the intersections of each one will be applied to assist teachers to integrate technology effectively in their classrooms. The exploration of technological knowledge (TK) would initiate the intervention process that will be done to assist Grade 9 teachers to be knowledgeable about TPACK constructs and how to apply them in their teaching and learning.

3 PROBLEM STATEMENT

Irrespective of the popularity of digital technology, the positive role that teachers play in integrating technology and the possible advantages of the use of digital technology in the classrooms, many teachers and schools in South Africa, for various reasons, still resist the use of technology or have low levels of digital technology integration (Van Greunen et al., 2021). Despite the advantages that digital technologies, such as laptops, tablets, and Wi-Fi provide and the urgency for online education highlighted by the world-wide pandemic, digital technology integration is still low (Mihai, 2020), specifically regarding many teachers and schools in South Africa.

In the Dinaledi cluster, Bojanala District in North West Province of South Africa, training opportunities and access to the Teacher Development Centre computer laboratory provides teachers with opportunities to develop the necessary knowledge and skills on how to use digital technologies to support learning and deliver lessons. However, the computer laboratory manager indicated that teachers are reluctant to attend training and only a few utilise the computer laboratory which raises concerns as teachers in the 21st century are expected to play a key role in optimally enacting the use of digital technologies to facilitate teaching and learning (Fransson et al., 2018). This leads to the question 'How do Grade 9 teachers experience integrating digital technology in their classroom', especially when teachers do not make use of the training opportunities provided. This prompted the researchers to take a further step and determine how teachers use technology and what challenges they experience. The TPACK framework, more specifically the TK construct, is used to explain the knowledge that teachers need to integrate digital technology in their classrooms (Mishra & Koehler, 2006).

4 THEORETICAL FRAMEWORK

As mentioned earlier, TPACK (Koehler et al., 2009) was identified as a suitable framework for the present research project. TPACK describes the role of technology, pedagogy, and content knowledge and how the intersection of the constructs influences technology integration in teaching and learning (Figure 1). TPACK further describes a framework where the nature of technology coupled with the complexity of integrating technology in the pedagogy of teaching and learning is considered. This bond between technology, content, and pedagogy provides knowledge needed to successfully integrate technology in digital learning.

A previous study (Akram et al., 2021) assessed online teaching skills of teachers during COVID-19 and found that TK was the lowest. Hence, the present study focuses only on TK, specifically how Grade 9 teachers experience the integration of digital technology in the classroom.

Defining TK is said to be notoriously difficult as it becomes outdated by the time the study is published (Koehler et al., 2009). This is due to the ever-changing nature of technological tools and resources. Although TK, as understood within the TPACK model, is seen as the fluency of information technology which moves beyond traditional computer literacy, it is rather

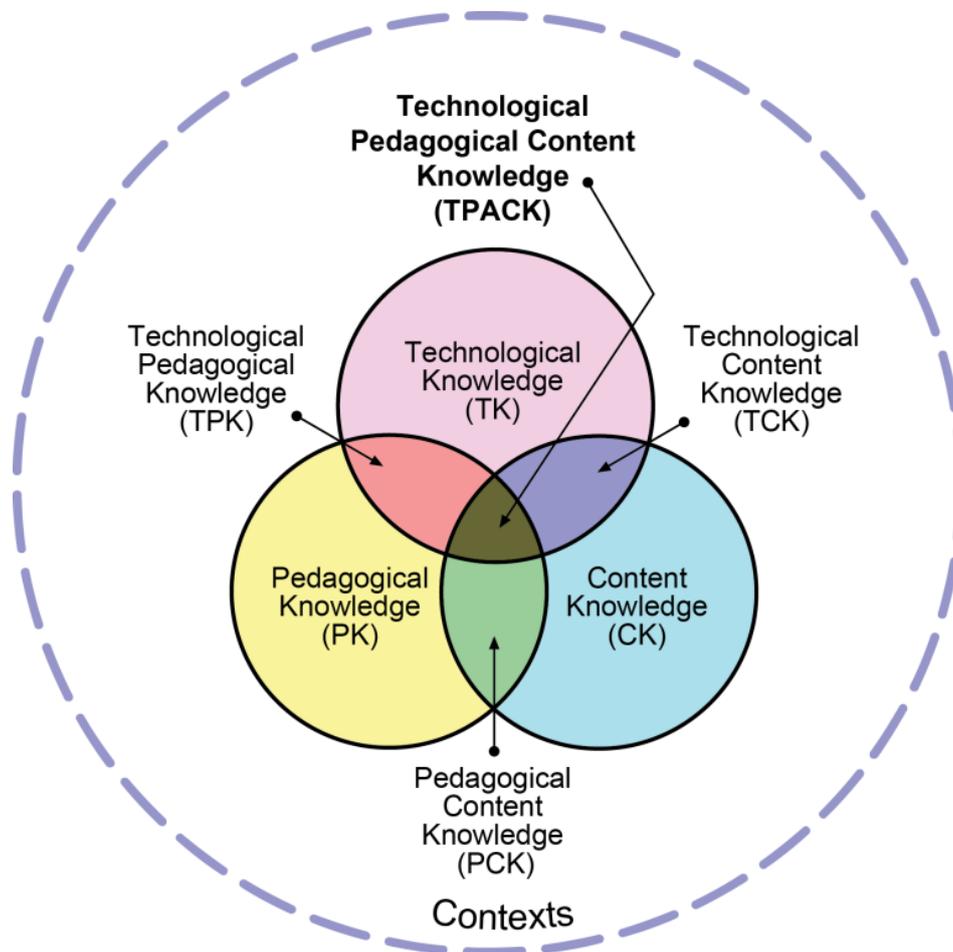


Figure 1: The TPACK framework and its knowledge components ^a

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the ability to implement information technologies for teaching and learning purposes (Koehler et al., 2009). There is a deeper level of understanding that involves the mastery of information technology to process, communicate, and problem solve. While TK is a developmental construct that is constantly evolving, it could be achieved through open-ended interaction and repetitive use of technology (Koehler et al., 2009) and refer to the knowledge teachers have of emerging digital technology (Cox & Graham, 2009). The integration of technology is a complex matter because of its volatile nature (Koehler et al., 2009) as well as the uniqueness of the challenges that come with the use of each digital technology. For example, when teachers need to create documents on a laptop, they can do so with or without having electricity, however, if they need to share documents with learners (connectivity), electricity is needed for an Internet connection. Therefore, having unreliable electricity at schools influences the utilisation of digital technology.

Therefore, a focus on the TK includes how the technology works and that the integration of the digital technology itself is key (Koehler et al., 2009). Appropriate digital technology needs to be selected to suit the content intended to be delivered. When integrating digital technology in the classroom, it becomes the change agent even though it was not designed specifically for education (Dietrich, 2018) as it could transform content and lesson delivery. Therefore, in this study TK was used to guide the research in framing the interview questions. The questions were built around aspects such as the access teachers have to digital technology, how they integrate and experience using the digital technology, and what kind of challenges they experience or support they get or need.

In this study teachers had to practise their teaching under challenging circumstances. Not only were they amidst a pandemic which caused schools to implement various kinds of social distancing, sanitising, and rotational attendance measures, they were forced to use digital technology in an environment that lacked electricity, security, and sufficient Internet access / data. It is within this scenario that the present community project was launched to use the TK part of the TPACK framework to determine how Grade 9 teachers use digital technologies to support learning and deliver lessons in their teaching and learning environments.

5 METHODOLOGY

An explorative qualitative case study (Creswell, 2014; Maher et al., 2018; Yin, 2018) was conducted in the Bojanala District, North West province, the Dinaledi cluster. This district was chosen since the schools do have some digital technologies that were sponsored or provided by the South African Department of Education. The researchers aimed to explore how these digital technologies were being used for lesson delivery.

5.1 Sample

A purposeful sample of seven Grade 9 teachers were interviewed online due to COVID-19 regulations at the time. In qualitative research, purposeful sampling is often used to select participants who have an interest in the matter under investigation (Palinkas et al., 2015). The teachers were selected based on the grade they taught. In some schools it is a practice for Grade 9 teachers to follow their learners to the next grade and scaffold their learning as they progress from one grade to the next. For example, the same mathematics teacher in Grade 9, will in all likelihood be the learners' mathematics teacher in Grade 10 since they know what scaffolding they have done to guide learners as they learn new concepts and construct new knowledge. While this study is part of a three-year project, the data collection focuses on Grade 9 teachers. In three years, class visits, document analysis and implementing an intervention for the same group of teachers is being done, while they teach Grades 9, 10 and 11.

5.2 Data collection

To collect qualitative data for this explorative case study, semi-structured interviews were designed and conducted virtually or telephonically after school hours using Microsoft Teams or a voice recorder (Smith, 1995). Semi-structured interviews allow the researchers to clarify concepts, probe for more detail, and to ask participants to explain their responses (Bless et al., 2013). The interview questions were designed based on the TK construct of TPACK and keeping the research question in mind. Permission was obtained to record the interviews which were conducted over a 30-minute time period. The interview consisted of open-ended questions which relate to what digital technology the teachers have access to, how they integrate technology in the classroom and what challenges they experienced. The collection of data included teachers' authentic experiences of using various digital technologies to plan and deliver lessons. These interviews were transcribed and analysed to identify themes related to teachers' use of digital technologies in their Grade 9 classrooms.

5.3 Data Analysis

After the interviews were transcribed, a thematic analysis was carried out where the text was identified, analysed, and interpreted (Braun & Clarke, 2006). First, the text of the transcript was read with the research questions in mind (deductively), with emphasis (highlight) placed on what digital technology the participants used (TK), how they experienced the use of digital technology, what challenges they experienced, what support they received, and their suggestions for improvement. From this thematic analysis, the responses were grouped according to themes which guided the presentation of the findings.

5.4 Ethical clearance

The principal investigator requested permission to do the project at nine schools in the Dinaledi cluster within the Bojanala District, Northwest province, through the University of South Africa's Ethics Committee. Furthermore, an entry request to the nine schools in the Dinaledi cluster was sent to the acting sub-district manager at the time. Letters to the respective principals of the schools asking permission to interact with teachers were also considered. Ethical consideration was maintained by using voluntary participation, informed consent, anonymity, and confidentiality. To ensure anonymity, the participants' names were not disclosed, however, their responses were labelled as T1 to T7 respectively.

6 FINDINGS AND RESULTS

This study explored Grade 9 teachers' use of digital technologies in their classrooms. The research question 'How do Grade 9 teachers experience integrating digital technology in their classroom' was formulated and used to reveal opinions and experiences of Grade 9 teachers in integrating digital technologies in their lesson delivery.

There was no apparent reason for gender, age, and experience preference in this study, however, it does provide the context and background of the participants. As Table 1 illustrates, five of the participants were the so-called digital natives (born after 1980), while the other two participants are digital immigrants (born before 1980) (Prensky, 2001). All the participants teach Grade 9, however, some of the participants also teach subjects that range from Grades 8 to 12 (Table 1). The influence of gender, age, and experience was not investigated, since a previous study (Abukhattala, 2016) found that these factors do not influence digital technology integration in secondary schools.

Table 1: Biographical data of participants

Participants	Gender	Age	Grades teaching
T1	F	31–40	8 9 11 12
T2	M	20–30	9 11 12
T3	F	20–30	8 9 10 11 12
T4	M	20–30	9 10 11 12
T5	M	20–30	8 9 10
T6	M	51–60	8 9 10
T7	M	41–50	8 9 10 11 12

Prior to exploring how teachers experience the integration of digital technology in their classrooms, it was important to have an indication whether teachers have access to digital technology and what digital technology is available and used. For example, in Figure 2, it is evident that all seven participants indicated that their schools have laptops and projectors, while the applications used are minimal (only one or two of the participants are using the devices available to them).

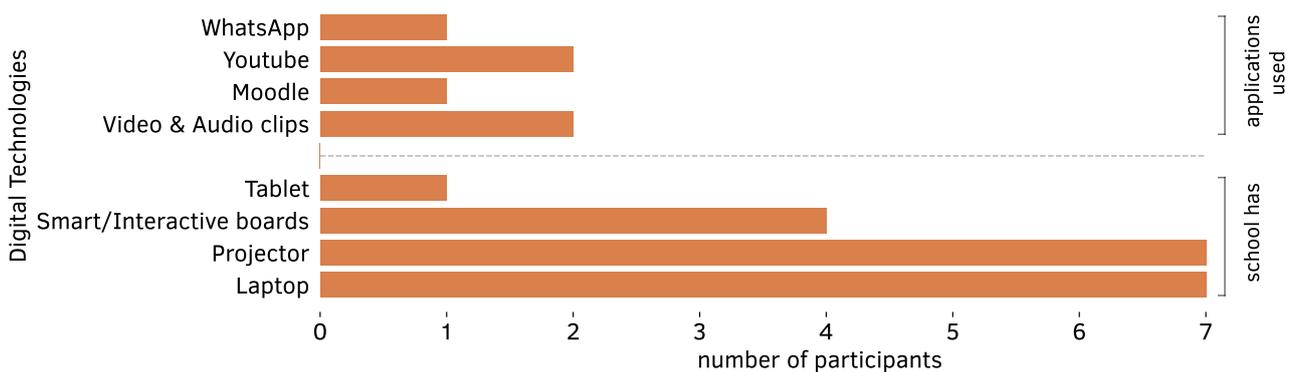


Figure 2: Digital Technology available at school [T1–T7]

Apart from the biographical data (Table 1) and the digital technology that the teachers used (Figure 2), three themes emerged: limited integration of digital technologies; lack of

infrastructure; and support in the use of digital technologies and experience in using digital technologies. The presentation and discussion of the findings are concurrently done. Seven participants shed light on their experiences regarding delivery of lessons using digital technologies and the support rendered to learners in teaching and learning.

6.1 Limited integration of digital technologies

The integration of digital technologies in the context of this study is a concern. Only two [T2; T4] of the participants deliver lessons regularly using digital technologies. Their reaction is that,

“The integration of digital technologies is not taken seriously in Grade 9 because priority is given to the Grade 12,” [T5]

referring specifically to the subject content. It appears the priority of the school is to use technology for the Grade 12 subjects (higher grades) rather than the lower grades. Since Grade 12 is the entry requirement to higher education, their syllabus gets preference. This raises a concern, since teachers should understand how to use different digital technologies to transform the delivery of lessons irrespective of the grade they teach and should not limit the use of technology only to higher grades. According to a previous study (Koehler et al., 2009), TK requires a deep understanding of a variety of digital technologies to process, communicate, and problem solve when teaching the content.

Contrary to the findings of this study, an earlier study (Beardsley et al., 2021) revealed that the integration of digital technologies has increased and the teachers are motivated to improve their digital skills as they proceed using digital technologies for delivering their lessons. In the current study emphasis is on delivery of lessons using digital technologies. Participants used:

“a laptop as well as the data projector, sometimes the interactive white board to show them my activities.” [T4]

In other instances, YouTube videos are downloaded while connected to Wi-Fi at the participants' respective homes [T2] and this allows the learners to watch and listen to the video clip at school without Internet connection (offline) or video lessons are downloaded and sent to learners after hours [T3]. Audio clips were also sometimes played, for example:

“I make use of audio for listening comprehension activity, they can listen to and then they also write or ask questions that I have given them.” [T1]

Learners are requested to respond to questions after watching the videos or listening to the audio clips. Two participants [T6; T7] did not integrate digital technologies into their lessons. Participant [T7] admitted:

“Not really, I don’t use any digital, it is just like I don’t know whether to call it an older traditional teaching and then at times if I have like certain lessons, maybe where there are teaching aids, nothing really digital.” [T7]

Although the integration of digital technology was limited, the participants' views on the use of digital technologies agrees with an earlier study (Huang et al., 2021) that there is always a positive impact in teaching and learning. A further study (Dzakpasu & Adom, 2017) found that digital technologies have impacted favourably on the digital technology integration of teachers. Teachers' perceived knowledge of how to effectively integrate digital technologies in teaching and learning is lacking, which makes delivery of content inadequate (Chigona, 2018). However teachers have no choice but to embark on the use of digital technologies to deliver their lessons, since digital technologies play a significant role in paving learners' future careers paths and enabling them to become informed citizens. Since the present study found that technology is not often used, the TK is lacking, making it nearly impossible to implement lessons using technology (Cox & Graham, 2009).

6.2 Inadequate infrastructure and support in the use of digital technologies

Since the common digital technologies identified by the participants at their schools were laptops and projectors (in [Figure 2](#)), the challenge is to use them since many have no Internet and sometimes no electricity. In some schools only a few of the classrooms have electricity and in some cases the laptops are locked away and it takes time to sign them out and take them to the class [T3]. Four of the schools have either a smart board or an interactive whiteboard while the Grade 12s have tablets to use [T5]. The following excerpt bears evidence:

“Our school has the interactive white boards, it also has the projector, and then laptops, yes, and that is what we have in our school.” [T4]

Another participant [T5] said;

“All teachers have laptops, there are 2 projectors in our school and a smartboard. Grade 12’s (students) have been given tablets.” [T5]

The available digital technologies in a school plays an essential role in the integration of digital technologies. Although not all schools have the same digital technology available, digital technology integration is possible, however, dependent on the type of digital technologies a school has. In a previous study (Kundu et al., 2020), the empirical findings revealed that the integration of digital technologies was delayed as a result of moderately low infrastructure and poor teachers' perception on digital technologies integration. Bariu (2020) echoed a different sentiment, where the availability of ICT infrastructure necessitates the need for transforming the delivery of content. Teachers can only be encouraged to integrate digital technologies in their lessons if a variety of devices are available for use within a school. Furthermore, the

provision of infrastructure should be the appropriate choice of digital technologies that should be used to advance student learning and understanding (Koehler et al., 2009).

The lack of training on how to integrate technology can increase the dependency on support and can be another reason for teachers not to use digital technologies in delivering their lessons. Only one participant mentioned receiving formal training while at university, however, the remainder did not receive any background training. However, the eagerness of some teachers who are integrating digital technology is evident:

“I have no formal training as I did not do computer science, I just started using the computer.” [T2]

Similarly, one participant also commented that:

“Eish I did not receive any training, I just learned how to use these by myself, but for the interactive white board, we had this, there was a three-year programme for those people who donated the interactive white board in our school, so we normally go maybe three days, three to five days, two times in a year.” [T4]

The superficial knowledge of digital technologies imposes limited integration in teaching and learning. The environment is aggravated by teachers who depend solely on time-consuming self-directed learning (Calderón-Garrido et al., 2020) because of the fear of being left behind. However, strategically well-prepared training should be organised (Modelska et al., 2019) so that teachers experience teaching and learning activities aligned to the use of digital technologies for transformation of delivery of lessons. One participant mentioned:

“What I do think is that there should be short courses to engage that will help teachers on how to use these devices because I have realised that most teachers are struggling ...” [T6]

Not only the teachers, but:

“... also our learners need to be trained how to use those, ... if there is an app that we can use to conduct online learning where they will require a password of something, they must be trained through all of these.” [T1]

For these participants, it is not only about having digital technology resources but also,

“... especially educators need to be educated about the importance of using this ICT” [T4]

and this demonstrates the lack of the TK that teachers have. Since the rapid transition to online learning during COVID-19, teacher training in the use of digital technologies became a necessity (Van Greunen et al., 2021). As a result, a redefined teacher training model must be introduced that encourages learning anywhere, anytime (Valverde-Berrocso et al., 2021).

Schools not only lack technology infrastructure but are also in need of more classrooms, electricity, and Internet. According to one participant:

“Our schools have a challenge of not getting enough classrooms. If you are planning to deliver with a projector, you are allowed to use the projector in a spare space like a storeroom.”

[T5]

However, collegiality plays a significant role in learning to do something that would benefit a group. A few participants [T3; T5; T7] mentioned that they ask another ‘young teacher’ to assist if they need support. Another participant shed light in saying:

“We usually encourage a SMT member, we do encourage each other to use those stuff and those who do not understand how to use them we help them, we help each other, like especially on, yes, downloading videos, simple things like downloading videos and then I gather there are those teachers born before technology.”

[T3]

In order to realise an effective utilisation of digital technologies in delivering and preparing lessons, a more sustainable and comprehensive teacher training system needs to be developed and should provide all teachers with the necessary technology and infrastructure knowledge (Beardsley et al., 2021). This training system also needs to be supported by the officials of the provincial departments and the South African Department of Basic Education [T5; T7].

6.3 Experience in using Digital Technologies

Integrating digital technology in teaching and learning is a challenge (Viberg et al., 2020) and was not found to be any different for the participants in this study. Similar to the findings of other studies (Abukhattala, 2016; Nikolopoulou, 2020), infrastructure remains a challenge. Participants mentioned that lack of electricity, Internet access, the limited number of devices and poorly resourced classrooms [T2; T3; T7], all impacted the teachers experience with regards to how they experience using digital technologies to enhance their lessons.

“Well I like to have an alternative, so sometimes when we are busy, playing the video, electricity will go off, so I like to have my alternative.”

[T2]

Even if the school has a classroom with electricity and technology to use, preference is given to the Grade 10 to 12 learners, leaving Grade 9 teachers to continue without technology. However, in some cases, Grade 9 teachers did manage to use technology [T2; T4] even if they had to use their personal mobile phones or download videos at home so that the learners can watch it in class (Abukhattala, 2016).

“So, we do download video lessons and then send them when we are at home. We send them to their phones, while they are at home, they use them when they are at home, but when at school, it is not going to materialise.”

[T3]

Irrespective of their attempts and opportunities to use technology, teachers still express that they need more support. Fortunately, some of the school's subject groups support each other [T3] or they have an IT champion (teacher proficient in technology use) that increased knowledge regarding technology.

"In most cases I ask someone who is well knowledgeable. Sometimes I use my phone to Google and get a solution." [T5]

Teachers should be equipped with troubleshooting skills to avoid disruptions when using digital technologies in teaching and learning. A teacher should be aware that if the electricity goes off during a lesson, a surge protector can provide a stable current flow when electricity returns. According to an earlier study (Viberg et al., 2020), if teachers do not have knowledge of addressing the barriers to integrating digital technologies in teaching and learning, they struggle in making learners understand how they can learn from it as well as how to navigate the tools or a platform using instructions. Improving digital technology usage in schools can be done in different ways, ideally to provide a teacher with infrastructure and allow the learner to use it as deemed fit to achieve the learning outcomes (Kara & Cagiltay, 2017; Monteiro et al., 2021).

The three themes that emerged from the data is indicative of the role TK plays in the Grade 9 teachers' experience when integrating digital technologies in their classrooms. The participants shy away from using digital technology mostly because they do not have access to it, however, their lack of using it could not be contributed to the lack of TK. However, the majority of the teachers attended a limited number of training opportunities and that resulted in a lack of knowledge integrating digital technology resulting in them experiencing a series of challenges when attempting integrating digital technology on a limited scale. From the data it is evident that all three themes in one way or another relate to technology or the lack of using technology (TK). Not only is the use/no use of technology an issue for the teachers, they also lack the 'know how' to translate the content that they know in a way to incorporate technology and at the same time reach the learning outcomes. This 'know how' translates to the lack of TK.

7 CONCLUSION

This study explored the Grade 9 teachers' experience when integrating digital technologies in the classrooms. The findings revealed limited integration of digital technologies in delivering lessons making TK non-existent. The reasons for this vary from not having the technology available, lack of support, to not having the knowledge or 'know how' to integrate digital technologies. The minimal support provided to teachers and the challenges experienced as they integrated digital technologies in their lessons, resulted in less support to learners. The TK (construct of the TPACK framework) in the context of this study, not only highlights the importance of technology knowledge to integrate appropriate digital technologies in the classroom, but

mirrors the lack of digital technology integration. Teachers should understand the working of digital technologies in order to use them effectively in their classrooms.

Worldwide, the COVID-19 pandemic forced the rapid transition to technology integration and where possible, attempts to implement digital technologies (Ganimian et al., 2020). However, more than 50% of the learners in low-income countries and in poor surroundings were unable to participate, resulting in no learning opportunities for them. While one of the advantages of digital technology is to increase access to quality education (Valverde-Berrocoso et al., 2021), the pandemic highlighted the digital divide (Collie et al., 2018). All these initiatives are commendable, however, if a student does not have electricity, Internet access or data, this is of little value (Viberg et al., 2020).

Irrespective of all the challenges faced, some teachers did use digital technology, even if it was their own personal devices, to integrate digital technologies into their lessons. In this study, it was clear that when there is one teacher (champion) that uses digital technology, it encourages others to also use it, and it means that just-in-time support and encouragement is available (even on a limited scale) to other teachers. Also, the value of supportive school leadership is evident in the discussion with the participants as well as the need for continuous professional development opportunities. This study recommends that more research is conducted regarding the lack of pedagogical knowledge, and strategies planned to provide training opportunities for teachers on the integration of both technology and pedagogy knowledge to deliver their lessons.

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