
DISSERTATION SUBMISSION

**Title: Exploring factors that impact ICT
integration in Free State senior phase EL2
classrooms**

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*Inspiring
excellence,
transforming
lives through
quality,
impact, and
care.*

**Dissertation submitted in fulfilment of the requirements
for the degree Master of Education with specialisation in
Subject Education in Language in the Department of
Languages in Education**

Faculty of Education

DECLARATION

I, **Mopedi Peter Khaile**, declare that the dissertation **Exploring factors that impact ICT integration in Free State senior phase EL2 classrooms**, submitted for the qualification of Master of Education: Subject Education in Language at the University of the Free State is my own independent work.

All the references I have used have been indicated and acknowledged by means of complete references.

I further declare that this work has not previously been submitted by me at another university or faculty for the purpose of obtaining a qualification.

Signed: **MP Khaile**

Date: 2024.11.24

DEDICATION

Glory be to God, for my parents, Moeti and Manuku, to whom I dedicate this accomplishment. I thank them for their initial foundation towards my academic achievements. This work is also dedicated to my loving wife, Mmone, and our two pretty daughters, Bonolo and Tsebo, for their patience and understanding during this journey. All your support is mostly appreciated!

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ABSTRACT

The Fourth Industrial Revolution (4IR) calls for the current global order to instantaneously adapt to management and governance needs of Industry 4.0 economy. Equally, the education sector needs to adjust rapidly to the concomitant innovations to benefit from the epoch of technological advancement. In South Africa the education sector faces the predicament of ICT enhanced pedagogy that has not advanced as predicted to improve teaching and learning. This study examined the integration of ICT in English Second Language (EL2) pedagogy. The study unfolded in two articles, adopting a qualitative approach. A phenomenological research design was used. Data were analysed, employing an eclectic approach to inductive content analysis. The first article explored teachers' knowledge, skills and attitudes and types of digital technologies available and to which extent they were used in EL2 pedagogy. The second article examined how senior phase teachers integrated technology in EL2 instruction, and learners' perceptions towards learning EL2 with the aid of ICT. The Technological Pedagogical Content Knowledge (TPCK) framework was employed to conceptualise ICT integration, juxtaposed with the theory of constructivism. Findings from the study revealed: (1) inadequate provision of ICT resources in schools, (2) rigid anti-mobile technology practices in schools, and (3) a need for a paradigm shift towards learner-centred language pedagogy.

Key words: constructivism; EL2 pedagogy; ICT; integration; 4IR; qualitative; teaching and learning; TPACK

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LIST OF ABBREVIATIONS/ACRONYMS

4IR	Fourth Industrial Revolution
ANA	Annual National Assessment
BBT	Born Before Technology
Cf	Refer to
CALL	Computer Assisted Language Learning
CALP	Cognitive Academic Language Proficiency
CAPS	Curriculum and Assessment Policy Statement
CK	Content Knowledge
COVID	Corona Virus Disease
DBE	Department of Basic Education
DoE	Department of Education
DST	Digital Story Telling
DTDC	District Teacher Development Centre
EFAL	English First Additional Language
EL2	English Second Language
ELT	English Language Teaching
Email	Electronic mail
FSDoE	Free State Department of Education
ICT	Information and Communication Technology
L2	Second Language
LoLT	Language of Teaching and Learning
LSA	Large Scale Assessments
NCS	National Curriculum Statement
NS	Natural Science
PCK	Pedagogical Content Knowledge

PIRLS	Progress in International Reading Literacy Study
PK	Pedagogical Knowledge
PP	PowerPoint
SA	South Africa
SACME	Southeastern African Consortium for Monitoring Education Quality
SOP	Standard Operating Procedure
TCK	Technological Content Knowledge
TEL	Technology Enhanced Learning
TIMSS	Trends in International Mathematics and Science Study
TK	Technological Knowledge
TPACK	Technology Pedagogy and Content Knowledge
TPCK	Technological Pedagogical Content Knowledge
TPK	Technological Pedagogical Knowledge
UFS	University of the Free State
UNESCO	United Nations Educational, Scientific and Cultural Organization
viz	namely
Web 2.0	Second Web Generation
Wi-Fi	Wireless fidelity
XK	Contextual knowledge
ZDP	Zone of Proximal Development

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

It is anticipated that the 4IR will usher in a technological era of digital mobility and interaction among individuals to support and contend with life (Xu, David & Kim, 2018:90). Within education, implications of the 4IR concern a shift towards using digital pedagogies in teaching and learning, according to Sikhakhane, Govender and Maphalala (2020:709). To adequately manage its implications, students and educators across the education spectrum are required to learn about the many different factors involved in the 4IR, the actual consequences of which we are still to realise as humanity. However, the truth is that to keep up with the concomitant advancements in technology and digitalisation, it is imperative for the education sector to respond rapidly (Sikhakhane, Govender & Maphalala, 2020:705). This imperative is enunciated by the Action Plan to 2019, in which the Department of Basic Education (DBE) reflects on the progress towards its 2030 goals. According to it, the integration and use of digital technologies in the classroom can no longer be viewed as a luxury or choice—it is inevitable (DBE, 2015:17).

Chehimi and Alameddine (2022:103) and Dlamini and Dewa (2021:20) propound that technology is the most significant criterion of development and growth in many countries worldwide. The success of Information and Communication Technology (ICT) in education globally, reveals that the designing of pedagogic ICT strategies is in the vanguard of educational activities (Kian, 2019:383). These countries include Chile, Malaysia, Thailand and Singapore, as well as China (Zeng, 2022:1063), Australia and Finland (Kian, 2019:383), which have arguably the most advanced ICT integration programmes in education.

In South Africa (SA), the DBE has also introduced digital technologies to enhance instruction in schools (Graham, Stols & Kapp, 2020:749). Current initiatives include the development of district teacher development centres (DTDCs) in all provinces, which are meant to increase access to and use of digital pedagogic resources, the roll out of tablets to schools, zero-rated websites and learning portals, podcasts, e-learning, online video and audio tutorials which can be accessed on different channels or websites. In the Free State (FS) province, the e-learning unit of the provincial department of education has introduced various ICT based interventions

such as the Internet Broadcast Project (IBP) and SMART schools. The unit has partnered with the University of the Free State (UFS) through the IBP to broadcast live lessons via VSAT Internet Access (UFS:2021) and SchoolNetSA in hosting Innovation Days, roadshows, TeachMeets and other workshops to inspire teachers and enhance their capacity to integrate technology into pedagogy (SchoolNetSA, n.d.). Nonetheless, the predicament faced by the education sector in SA is that progress in the uptake of educational ICTs and incorporation thereof in teaching and learning has not been as anticipated, according to the Action Plan to 2019 report (DBE, 2015:34). The report laments that “there is still a major weakness in the system when it comes to the implementation of ICT to improve the teaching and learning process” (DBE, 2015:14), which is also acknowledged by Vandeyar, 2021:44; Sikhakhane, Govender & Maphalala, 2020:709; Jacobs, 2018:56).

Outdated pedagogic approaches have largely been the norm in most South African schools in the recent past. These approaches are characterised by the many teachers who still employ transmission-based, teacher-centric pedagogy. This pedagogic approach gives prominence to the teacher’s role as the possessor of knowledge, and focuses on content-coverage (DBE, 2015:37), rather than developing higher-order thinking (Dlamini, Dumas, Lewis, Lilley, Madhav, Molotsi, & Simelane-Mnisi, 2018:22). Dlamini et al. (2018) further observe that, despite some of the well-resourced schools having adequate ICT resources in the 21st-century, many teachers still opt for traditional instructional methods. The dilemma faced by those South African schools that do not use ICT to enhance teaching and learning, means that their teachers and learners face the prospect of losing out on 21st-century skills of problem-solving, creativity, collaboration, communication and critical thinking. These skills are believed to benefit from the pedagogic integration of ICT.

Regarding the pedagogic integration of ICT in schools in the Free State, Jacobs (2018:3) advocates for the development and implementation of a clear e-Learning strategy by the FS Department of Education (FSDoE). This is subsequent to the research which revealed that among the five education districts in the FS, Fezile Dabi district ranked fourth when teacher ICT integration and learner exposure were compared across the districts (Jacobs, 2018:56).

Potentially, ICT has the capacity to transform language pedagogy. Through ICT, learners can communicate, collaborate, and connect with others in virtual spaces. It

is widely acknowledged that Web 2.0 (Second Generation Web) tools have transformed second-language learning contexts through intercultural tele-collaborations, networked classroom activities (Rwodzi, De Jager & Mpofu, 2020:5; Vandergriff, 2016:2021), language-learning networks, such as wikis, blogs and Facebook groups (Rwodzi, De Jager & Mpofu, 2020:5; Caruso, 2018:89) and learner interaction, creativity and collaboration (Mohammed, Assam & Saidi, 2020:179). In addition, Mohammed, Assam and Saidi, (2020:178), Rwodzi, De Jager and Mpofu (2020:5), Sabiri (2020:186) and Shafie, Majid and Ismail (2019:28), posit that Web 2.0 technologies promote independent learning, networking, and personalisation of learning. The contribution and pedagogic impact of educational technologies in English L2 instruction are also documented in several studies (compare Lasut, 2023:416; Chehimi & Alameddine, 2022:110; Rwodzi, De Jager & Mpofu, 2020:6; Dianti & Atmanegara, 2019:486).

On the other hand, research by Alhumaid (2019), illuminates findings on a related 2017 study by UNICEF, which argues in support of the negative effects of technology in education. Regardless, there is overwhelming research evidence to the contrary, attesting to the pedagogic benefits of ICT integration.

To foster quality teaching and learning in SA schools, the DBE introduced three key policies on ICT, namely the e-Education Policy (DoE, 2004), Guidelines for Teacher Training and Professional Development in ICT (DoE, 2007) and the Professional Development Framework for Digital Learning (DBE, 2018). Even so, in many SA schools, the assimilation of technology and integration of educational ICTs have remained inadequate (Sikhakhane, Govender & Maphalala, 2020:709; Dlamini et al., 2018:22; Padayachee, 2017:67), as implementing these policies was widely neglected (Vandeyar, 2021:44). Mwapele, Marais, Dlamini and Biljon (2019:5) cite school security weaknesses, lack of suitably trained teachers and poor classroom infrastructure in SA rural schools, among the limitations to the integration of ICT in teaching and learning. Others include poor internet connectivity and teachers' attitudes towards ICT (Chisango, Mtsi, Marongwe & Matyedi, 2020:2). These limitations do not only impact the pedagogic use of ICT in schools. They also form the basis for the purpose of this study, which sought to address the research question:

It is thus in light of the foregoing that this study was initiated. The study spanned two interrelated articles which have been submitted for publication consideration in two

different academic journals. Research through articles is one of the options provided for in the UFS Policy on Master's and Doctoral Studies (2022:5). This provision, together with the fact that the articles provide an opportunity to communicate my findings and insights to a more specific academic community, motivated the choice of the article option. Both articles attempted to examine the pedagogic integration of ICT in English L2 pedagogy in the senior phase, albeit at the level of teachers and learners. The senior phase represents 7th, 8th and 9th grades in the SA basic education schooling system. In this dissertation, senior phase is used to refer to both 8th and 9th grades.

The articles were guided by the main research question. However, each article had its own research questions and sub-questions it responded to and objectives it attempted to address. The first article investigated how EL2 senior phase teachers integrated technology in their instruction. The second article examined senior phase learners' perceptions on integrating technology in the EL2 classroom.

1.2 STATEMENT OF THE PROBLEM

The 21st-century has seen rapid technological changes (e.g. computer-assisted language learning, online and blended learning approaches, and virtual and augmented reality) in second or foreign language teaching and learning (Zhou & Wei, 2018:472). Despite the increasing availability of educational technology to schools, research evidence indicates that teachers do not use it as expected (Crossley & Mcnamara, 2017:1). Many teachers are aware of the various benefits for learners and themselves in using ICT (Dreyer, Lombard, Mwaila, Materechera, Mbunyuza, Mokoena, Moreeng, Oduaran, Seroto, Themane & Van Wyk, 2015:78), and yet often fail to integrate it (as expected) into their instruction (Dlamini & Dewa, 2021:32; Graham et al., 2020:760; Padayachee, 2017:67).

ICT can be integrated in various ways to harness its affordances for enhanced EL2 instruction. For example, Microsoft PowerPoint is a versatile application with audio-visual capabilities. EL2 teachers can use it innovatively for listening, viewing, speaking and writing activities, while integrating features such as animation, video, graphics and text.

Digital story-telling (DST) is also considered an effective pedagogic tool EL2 teachers can use in developing learners' speaking, reading and collaborative writing skills

(Tamimi, 2024:325; Chubko, Morris, McKinnon, Slater & Lummis, 2020:3599). DST supports and promotes learning through content creation and collaboration as a multimedia approach that combines visual, auditory, and narrative elements (Tamimi, 2024:308). Other ways in which teachers can integrate technology include use of wikis, email, blogs and the pervasive cell phones (refer to 2.10 below for a detailed discussion).

7th, 8th, and 9th grades in South Africa make the senior phase, of which the latter two are the subject of this research. The predicament is that by the time learners enter the senior phase, many still display communicative and cognitive deficiencies in their additional language, English (DBE, 2012:9). That these deficiencies continue to manifest themselves even to the level of 12th grade (compare DBE, 2023; 2022; 2020), demonstrates the cause to explore the possible factors and barriers impacting the integration of ICT in the 8th and 9th grade EL2 classrooms. Despite the many benefits of educational technology, many teachers in SA still employ transmission-based, teacher-centric pedagogy (Dlamini & Dewa, 2021:32).

The foregoing is what the two articles of this study attempted to establish. To achieve this, the first article explored 8th and 9th grade teachers' views on integrating ICT in EL2 pedagogy in Maokeng schools. The second article examined 8th and 9th grade learners' perceptions on integrating ICT in EL2 pedagogy in Maokeng schools. The two articles individually investigated how ICT was integrated in the schools, and the barriers that prevented the teachers and the learners from integrating and using ICT.

Findings in both articles revealed that no ICT resources were used to support learning as educational technology in the EL2 learning environment. In the first article it was discovered that there was (1) a need for appropriate teacher training and development in ICT integration in senior phase EL2 pedagogy, (2) inadequate provision of educational technology resources at the schools, and (3) absence of clear ICT integration guidelines for teaching EL2 in the senior phase. The second article's findings revealed: (1) inadequate provision of ICT resources in the schools, (2) rigid anti-mobile technology practices in schools, and (3) a need for a paradigm shift towards learner-centred language pedagogy.

Research in instructional use of technology has revealed many of its pedagogic benefits (compare Nanjundaswamy et al., 2021:18; Vääätäjä and Ruokamo, 2021:2; Lazarov; 2018:13; Xu et al., 2018:91). There have also been similar studies in South

Africa (refer to Hart, 2023:10; La Fleur & Dlamini, 2022:6; Dlamini & Dewa, 2021:33; Kolobe & Mihai, 2021:303; Chisango et al., 2020:2). The focus, however, of these and other related studies has either been on higher education students, or, at school level, on learners and/or teachers in other school phases— the Foundation¹, Intermediate or Further Education and Training (FET) phases. The dearth of evidence of similar studies on learners and teachers in the senior phase EL2 pedagogic context thus instigated this study to fill this research void.

Equally, while various studies have highlighted the advantages of ICT for educational purposes as stated above, there is limited understanding of the factors that prevent teachers from incorporating ICT into their teaching, even when they are aware of its potential. Previous research has identified barriers such as lack of training, inadequate infrastructure (Sabiri, 2020:182; Alhumaid, 2019:16; Louw, Rankhumise & Maimane, 2019:305), and resistance to change (Hart, 2023:10; Sabiri, 2020:182; Lawrence & Tar, 2018:83), but little has been done to explore how teachers' perceptions, attitudes, and external support systems influence their actual integration of ICT (or want thereof) into their instructional methods.

The researcher therefore posits that addressing this problem is vital, as the effective integration of ICT can help bridge the apparent pedagogic gaps, particularly in enhancing 21st-century competencies like communication, collaboration, and critical thinking. By identifying and understanding the challenges teachers face in integrating ICT, educational policymakers, institutions, and professional development programs can better support teachers in overcoming these barriers, ultimately improving the quality of teaching and learning.

1.3 CONCEPTUAL FRAMEWORK FOR THE STUDY

The theoretical framework is unpacked in the following section.

1.3.1 TPACK

The TPACK² (Technology, Pedagogy and Content Knowledge) framework serves as the theoretical lens to this study, underpinned by tenets of constructivism. TPACK

¹ Foundation, Intermediate, FET. Phases in the SA basic education system representing 1st to 3rd, 4th to 6th, and 10th to 12th grades respectively.

² "Technological pedagogical content knowledge," or TPCK, and "technology, pedagogy, and content knowledge," or TPACK, are used as synonyms.

refers to the categories of knowledge, necessary for teachers to successfully integrate ICT in teaching (Mishra, 2019:1). Traditional, teacher-directed methods are seen as not building long-term, flexible knowledge. Contrarily, the TPACK model integrates knowledge of content, pedagogy and technology. By recognising the three components of the TPACK model and by integrating all of them, EL2 teachers can use ICT effectively in their lessons (Mishra, 2019). Furthermore, both researchers and teachers use TPACK to describe how to teach effectively with technology, as acknowledged by Foulger, Jin, Mourlam and Ebersole (2021:2), Roblyer and Hughes (2019:17) and Saudelli and Ciampa (2016:228). Details of the model and its application are expounded further in Chapter 2 of this study.

It is considering the foregoing that the researcher used TPACK as the theoretical base for the evolution of the topic. It also served as a conceptual lens to address the research question:

What factors impact ICT integration in FS 8th and 9th grade EL2 classrooms?

1.3.2 Constructivism

The rationale for juxtaposing constructivism with TPACK in this study derives from the assertion that TPACK recognises knowledge of technology as an intrinsic component of teaching and learning. Crossley and Mcnamara (2017:19) posit that in order to use ICT effectively, teachers must undergo a paradigmatic change from a teacher-dominated classroom to one where students actively learn with technologies in a constructivist learning environment.

Various forms of constructivism exist, as espoused by Von Glasersfeld (1989), Piaget (1976), and Vygotsky (1962). Nevertheless, one common element to which all these variants subscribe is that knowledge is a dynamic construct of the learners, perhaps as opposed to a passive construct they receive from the outside. The intersection between constructivist learning and technology is articulated in Kaya (2015:5), that the integration of virtual learning environments, relevant websites and certain digital programs into English language pedagogy, helps promote the ideal environment from the constructivist perspective.

Consequently, technology encourages learners to work more independently (Sabiri, 2020:186; Dreyer et al., 2015:76). At the same time, teaching with technology affords teachers a fundamental change from the teacher-directed classroom to the student-

centred classroom (Crossley & Mcnamara, 2017:19), creating optimum conditions for more effective second language learning.

In due consideration of the above, the researcher therefore advances that TPACK and constructivism be contemplated simultaneously to provide the theoretical context for the current study.

1.4 PURPOSE OF THE STUDY

The purpose of this qualitative study is to explore external and internal factors that might influence 8th and 9th grade EL2 teachers' perceptions regarding their instructional use of technology in Maokeng schools. The study also intends to explore how learners in 8th and 9th grades perceive the integration of ICT in the EL2 learning environment. This phenomenological inquiry seeks to understand how the teachers integrate ICT, and from those who do not, obtain their reasons for not using it. Learners will share their understanding and experiences of ICT integration.

1.5 RESEARCH QUESTIONS

There are various ways in which ICT affordances can be exploited by EL2 teachers through integration to support EL2 pedagogy. Research evidence suggests that many teachers do not integrate ICT in their instruction, even though they are aware of its benefits for themselves and for their learners. In SA the situation is compounded by the fact that many learners display poor levels of linguistic competence in English, for the majority of whom it is the language of teaching and learning. The question that arises is why teachers are not taking advantage of the pedagogic opportunities presented by integrating ICT in their lessons if that would improve the situation. This study aims to investigate the factors and barriers that impact the integration of ICT by 8th and 9th grade EL2 teachers. 8th and 9th grade learners in SA are reported to have poor command of English, which impacts their academic performance in the language and in other school subjects offered in English negatively.

To find answers to this phenomenological problem, this qualitative study is guided by the following research questions:

The main research question was:

What factors impact ICT integration in FS 8th and 9th grade senior phase EL2 classrooms?

The sub-questions were:

1. What are teachers' views on integrating ICT in senior phase EL2 pedagogy in Maokeng schools?
2. How is ICT integrated in senior phase EL2 pedagogy in Maokeng schools?
3. What are the barriers preventing senior phase EL2 teachers from integrating ICT in their instruction, despite their awareness of its benefits?
4. What are senior phase learners' perceptions on integrating ICT in EL2 pedagogy in Maokeng schools?
5. What are the barriers preventing senior phase learners from using ICT in EL2 pedagogy in Maokeng schools?

1.6 RESEARCH AIM AND OBJECTIVES

1.6.1 Aim

To explore factors that impact ICT integration in FS senior phase EL2 classrooms.

1.6.2 Objectives

The objectives were:

1. To explore teachers' views on integrating ICT in senior phase EL2 pedagogy in Maokeng schools.
2. To investigate how ICT is integrated in senior phase EL2 pedagogy in Maokeng schools.
3. To determine the barriers preventing senior phase EL2 teachers from integrating ICT in their instruction, despite their awareness of its benefits
4. To examine senior phase learners' perceptions on integrating ICT in EL2 pedagogy in Maokeng schools.
5. To investigate the barriers preventing senior phase learners from using ICT in EL2 pedagogy in Maokeng schools.

1.7 DEFINITION OF TERMS

1.7.1 Digital technologies

Digital technologies are devices like laptops, cell phones, document cameras, computers, interactive whiteboards, tablets, digital cameras, gaming consoles and digital microscopes (Mohammed & Kinyo, 2020:90; DBE, 2018:6; Padayachee, 2017:38) that may be used for teaching and learning. In educational contexts, and this

dissertation, teachers and learners use digital technologies to communicate, cooperate and collaborate to enrich teaching and learning. Digital technologies are used as a synonym for digital tools and ICT.

1.7.2 Educator

According to the Employment of Educators Act, No 76 of 1998, the term educator refers to an individual who educates or trains other persons or who provides professional educational services at any public school. In this dissertation, the terms educators and teachers are used synonymously.

1.7.3 Fourth Industrial Revolution (4IR)

The 4IR represents a fundamental technological change in how we live and interact with others. It is about how automation, digitization and advanced technologies will impact different sectors and spheres of human life.

1.7.4 Learner

Learner means any individual receiving education or who is obliged to receive education in terms of the South African Schools Act, Act no.84 of 1996. In this study, learner and student were used as synonyms.

1.7.5 School

School refers to a public or independent school (South African Schools Act 84 of 1996).

1.7.6 Senior phase

In South Africa, it is a phase in the basic education schooling system, representing 7th, 8th and 9th grades. In this dissertation, senior phase is used to refer to both 8th and 9th grades.

1.7.7 Web 2.0 technologies

Web 2.0 describes digital technologies, which include video-sharing sites, online communities, social media, and search engines (Rwodzi, De Jager & Mpofu, 2020:5; Caruso, 2018:89). Chehimi and Alameddine (2022:103) propound that in English second language instruction, Web 2.0 tools support learners' acquisition of 21st-century competencies such as collaboration, communication, critical thinking, and creativity.

1.8 METHODOLOGY

1.8.1 RESEARCH DESIGN

To address the research questions and objectives, a qualitative research approach was employed for both article 1 and article 2. The qualitative approach was adopted along Creswell and Creswell (2018:51)'s view that qualitative research is an approach employed to make sense of certain human phenomena. A phenomenological design was applied to explore the prevalence, extent and nature of challenges faced by the participants, their attitudes, beliefs, and practices in using digital technologies to enhance the quality of EL2 pedagogy. The design is also predicated on the assumption that participants give an account of phenomena through their experiences, usually by means of interviews (Creswell, 2018:61).

The research was also conducted within a constructivist paradigm. The place for constructivism emanates from the understanding that a constructivist researcher is usually concerned with interpersonal interactions (Kaya, 2015:4), and the specific environment that influences how individuals live and work (Roblyer & Hughes, 2019:52).

Furthermore, the TPACK framework was employed in the two articles to conceptualise the integration of technology. Technology integration, as described by Foulger et al. (2021:1), requires an educator to be astute at pedagogic content, choice of digital technologies and creating relevant and interactive learning opportunities. The TPACK framework was born out of the quest to describe the instructional use of ICT from the work done by Mishra and Koehler in 2006 and built upon by Shulman in 1986 and 1987.

Procedures that were followed in the collection of data are described in the section that follows.

1.8.2 DATA COLLECTION

Data were collected using the following data-collection techniques:

Interviews

Semi-structured interviews, as described by Samuels (2019:8), were employed in article 1 to gather information, face-to-face, from individual teachers on their opinions, thoughts, and experiences related to the study and the research objectives.

Accordingly, data were collected in the participants' settings, using emerging questions and procedures, and analysed inductively.

Even though audio and/or video recordings were not necessarily data collection methods, video was used to record information from the teachers. Aspects of anonymity and voluntary participation had been clearly explained in advance, and consent given by the participants. Transcripts of the recordings were later used to provide a record of the naturally occurring interactions during the interviews. Based on tenets of phenomenology, transcription of the data was done *verbatim*, and the recordings fully typed out, with accurate transcripts to reflect the discussions (Moser & Korstjens, 2017:7), lived experiences, and the meaning of these experiences (Cresswell & Cresswell, 2018, 207).

Observations

Direct, non-participant observations were carried out on the sampled teachers in practice, and on how learners participated in the lesson and what the interactions were. The observations were conducted to gain first-hand experience with the setting and understand the context in which interaction occurred. The teaching/learning space represented the context, while teaching and learning represented the interaction. All observations were supported by field notes, adding my own reflections on the situations observed. Observations have been included as part of the methodology in articles 1 and 2. Along the aim and objectives of the research, the researcher observed:

- how 8th and 9th grade EL2 teachers integrated ICT in their lessons.
- the context in which teaching and learning took place in order to relate it to the teachers' interview responses, the research questions and the findings of the research.
- the pedagogic interaction between the teachers and the learners, and between the learners themselves for the researcher to relate it to the learners' perceptions on integrating ICT in EL2 pedagogy.

The lesson observations were conducted according the schedules included under sections 3.4 and 4.4.

Focus group discussions

Learners' groups comprised combinations of eight 8th and 9th grade learners from each of the five participating schools. However, not all the 40 learners presented themselves, despite submitting the consent and participation forms. The learner sample was then reduced to 32 participants who took part in the discussions. Focus group discussions were conducted to obtain information from the learners. The researcher had pilot-tested the initial question guide to confirm if the questions were appropriate and the scope sufficient to warrant some amendments. The pilot involved a combined group of eight 8th and 9th grade learners, who were interviewed at one of the participating schools. Learners from this group were excluded from the actual discussions conducted later for data collection. No changes were effected to the discussion schedule subsequent to the pilot.

1.8.3 ANALYSIS AND INTERPRETATION OF DATA

This being a qualitative study, inductive content analysis was employed, which, according to Moser and Korstjens (2017:9) involved:

- organising the data into manageable items,
- assigning codes and names to the items relevant to their respective content,
- thematic grouping of the coded content based on common themes or aspects,
- searching for recurring themes both within and across interviews.

Interpretation of findings was informed by interpretivism, the basis of which lay in Blackwell's (2018:9) argument that truth and knowledge are influenced by cultural and historical experiences. This study sought to illuminate the teachers' and learners' interpretations and experiences regarding the infusion of ICT to foster a constructivist EL2 pedagogic approach.

The data gathered were triangulated through focus group discussions and field notes to enhance the quality (Moser & Korstjens, 2018:122).

In this study, findings revealed a mismatch between perceptions and observations, details of which are discussed in chapter 3, and chapter 4.

1.9 PARTICIPANTS

Participating teachers and learners were selected through purposive sampling. The participants were believed to have the knowledge and motivation to provide relevant information, and to communicate freely on the phenomenon under investigation, as elucidated by Vasileiou, Barnett, Thorpe and Young (2018:2) and Moser and Korstjens (2017:2).

The participants were selected according to the following quota sampling characteristics, according to Vasileiou et al. (2018:2) and Moser and Korstjens (2017:2):

Teachers

- Five teachers (A, B, C, D, and E) from five secondary schools (1, 2, 3, 4, and 5) and coded as 1-A, B-2, C-3, D-4, and E-5, were purposefully selected within the Maokeng residential area in Fezile Dabi education district, where the researcher resides and works. The schools were convenient sites due to their proximity and the researcher's familiarity with the area. The teachers were selected on the basis that they were teaching EL2 in 8th or 9th grade, or both.
- Five years or more EL2 teaching experience. Regarding knowledge of technology, the EL2 teacher should be familiar with the methods and approaches in use of ICT in teaching, as well as the ability to effectively use it (Cindrić & Gregurić, 2019:162).

The teachers were assigned the codes as stated above. The letters represent the sequence in which the teachers were interviewed, while the number represents the school where the teacher is employed.

Learners

The learners were senior phase learners in 8th and 9th grades of secondary school: direct beneficiaries of the aim and objectives of the study, and directly affected by ICT integration practices in the EL2 classrooms. The learners comprised combined groups of eight 8th and 9th grades purposefully selected by their English teachers. They were selected on the basis that they would be motivated and communicate at length and in depth with the researcher on the phenomenon of ICT integration (Moser and Korstjens, 2017:2). Moser and Korstjens add that they should be participants who can articulate and reflect, and supply the richest information. Since group discussions with

the learners would be held after school hours, another consideration was that the selected learners should be available at this time.

1.10 SIGNIFICANCE OF THE STUDY

The South African core syllabus for English, currently National Curriculum Statement, through its functional policy document, Curriculum and Assessment Policy Statement (CAPS, 2012), articulates the essential skills, values and knowledge to be learnt in SA schools. Among others, it intends to equip learners with adequate science and technology skills (DBE, 2012:3). Meanwhile, the Professional Development Framework for Digital Learning purports to cater for the professional development of “competent educators who use ICTs to enhance teaching and learning for higher learner attainment in the curriculum” (DBE, 2018:9). Following this, the dissertation attempted to examine whether EL2 teachers in 8th and 9th grade were integrating ICT in their instruction as expected, and if they used ICT to support learner-centred learning. The implications of the results of this study potentially mean that ICT can be integrated in EL2 instruction to support learner-centred pedagogic activities.

What makes this study relevant again is, while various studies have highlighted the advantages of ICT for educational purposes as stated above, understanding of the factors that prevent teachers from effectively incorporating ICT into their teaching is crucial.

Addressing this problem is equally vital, as the effective integration of ICT can help bridge pedagogic gaps, particularly in enhancing 21st-century competencies like communication, collaboration, and critical thinking. By identifying and understanding the challenges teachers face in integrating ICT, educational policymakers, institutions, and professional development programs can better support teachers in overcoming these barriers, ultimately improving the quality of teaching and learning.

In consonance with the foregoing, it is expected therefore that the study may:

- influence curriculum research, planning and design within the DBE;
- inform teacher professional development initiatives around ICT integration in EL2 pedagogy;
- pave the way for learners to traverse the challenges of the 4IR; and
- serve to reconcile theory and practice in ICT integration and thus bridge the gaps in EL2 curriculum implementation.

1.11 LIMITATIONS OF THE STUDY

Purposive sampling meant that the study confined itself to the five secondary schools within the Maokeng local precinct. As a result, adjacent schools and others outside the Maokeng zone were excluded. The teachers and the learners who participated in the research were from 8th and 9th grades, representing a select senior phase group, which restricted the scope of the research.

The study was also limited by the paucity of research literature centred on learners, especially in the senior phase. ICT integration in EL2 pedagogy added more prominence to this phenomenon. As a result, other aspects of second language teaching and learning were less considered. Only a limited number of interviews and lesson observations were conducted, based on time constraints and availability of participants.

1.12 ORGANISATION OF THE STUDY

The dissertation is arranged into five chapters, outlined as follows:

Chapter 1 gives the background to the study, with an exposition of the problem. The research question, the aim, sub questions and objectives are highlighted. These are followed by the definition of terms, methodology, participants, the significance, the limitations, and concludes with the organisation of the study.

Chapter 2 is a thorough review of the literature, with analyses of theoretical frameworks previously introduced into the research area. Guided by the research questions, this section discusses forms of digital technology that are being used in EL2 pedagogy, and how ICT presents opportunities for integrating instructional technology. The concepts 'digital pedagogy' and 'digital literacy' are elucidated, and the section concludes with a discussion on learners' skills and perceptions on ICT integration in ELT.

In **Chapter 3**, the first article is presented, based on the first three objectives as stated in Chapter 1. It provides insights into how the use of ICT can support constructivist learning. It also sheds light on senior phase teachers' views on integrating ICT in EL2 instruction and the types of digital technologies they use. The section further reports, *inter alia*, on the status of English in SA and other key findings on learner attainment. The focus of this articles is on the following three objectives:

- To explore teachers' views on integrating ICT in senior phase EL2 pedagogy in Maokeng schools.
- To investigate how ICT is integrated in senior phase EL2 pedagogy in Maokeng schools.
- To determine the barriers preventing senior phase EL2 teachers from integrating ICT in their instruction, despite their awareness of its benefits

Chapter 4 presents the second article, in which third and fourth objectives are addressed as indicated in Chapter 1. It examines ICT resources available to teachers and how they are used to promote 21st-century learning in EL2. At the same time, it looks at the extent to which ICT is used to achieve the aforesaid, as well as types of digital technologies used by learners in the EL2 classroom. The chapter concludes with a discussion on contextual factors impacting ICT integration in EL2 pedagogy and learner autonomy and collaboration. The focus of this article is on the following objectives:

- To examine senior phase learners' perceptions on integrating ICT in EL2 pedagogy in Maokeng schools.
- To investigate the barriers preventing senior phase learners from using ICT in EL2 pedagogy in Maokeng schools

Chapter 5 provides a comprehensive summary of the study framework. It sheds light on the importance of the topic and explains how the study intended to contribute to the body of knowledge on the topic. Research questions are highlighted, and the data analysis approach reported in Chapter 4 is illustrated. Conclusions, implications and recommendations of the study are presented.

Despite Chapters 3 and 4 being developed into individual articles, each with their own reference lists, the study comprises one reference list encompassing all the chapters. This is so that duplication of references is avoided.

1.13 SUMMARY

The imperative to make a digital shift in EL2 pedagogy is necessary if we are to manage the 4IR and its implications (Sikhakhane, Govender & Maphalala, 2020:705). The performance of many SA learners points some major weaknesses in reading and literacy as evidenced in several international and national assessments.

Current pedagogic ICT initiatives introduced by the DBE and its partners hold the potential to improve teaching and learning. Along with these initiatives, transforming EL2 pedagogy through ICT integration requires that teachers receive appropriate training and support. The following section reviews the relevant literature to place the research focus into perspective.

CHAPTER 2

REVIEW OF THE LITERATURE

2.1 INTRODUCTION

Vast differences exist in how teaching is practised today compared to the past (Shafie et al., 2019:25), especially in South Africa. Among other tasks, the modern teacher is expected to deal with multi-faceted intersections of innovative technologies, supporting actual classroom teaching (Dreyer et al., 2015:25). There are also varied expectations on the part of a contemporary teacher's expert knowledge, beyond subject knowledge. Knowledge of pedagogy, the curriculum, content, and knowledge of modern educational devices are the different kinds of knowledge the modern teacher should be equipped with, to support learning successfully and effectively (Foulger et al., 2021:1).

This chapter presents the theoretical outline for the study. To place the research focus into perspective, it also reviews the relevant literature. It identifies how epistemologies of directed instruction and constructivist learning theory foundations, and the technology integration model, i.e. TPACK, impact technology integration practices.

Furthermore, this section discusses forms of digital tools in use in EL2 pedagogy. A description of how digital technology shapes opportunities for integrating educational technologies in EL2 instruction is given. In addition, this section investigates the concepts 'digital pedagogy' and 'digital literacy', with a view to gaining an understanding of how they relate to the research and their significance to EL2 pedagogy.

The South African national curriculum, National Curriculum Statement (NCS), will be discussed, with focus on EL2 in the senior phase. The senior phase represents 7th to 9th grade in the SA basic education system. The influence of language – in this case, EL2 - on learner attainment, will be scrutinised through reports from LSAs (Large Scale Assessments) and various other studies.

The status of English in SA will be examined. Also, the most targeted objectives in EL2 pedagogy, e.g. listening, will be discussed, albeit succinctly, as requisites to learner academic achievement in other grades and school subjects. Distinctions will be drawn between traditional teaching and teaching with technology and the

implications of both for the study and learner achievement. The uptake of ICT in EL2 learning and teaching will be examined, together with challenges associated therewith.

For the sake of clarity, the following concepts in the dissertation have equivalent meaning:

- Learner-- student
- Teacher-- educator
- Technology-- ICT, digital tools

Above all, the study will endeavour to answer the main research question, which seeks to determine the factors that impact ICT integration in FS 8th and 9th grade EL2 classrooms.

2.2 TPACK FRAMEWORK

In the preceding section it was noted that the contemporary teacher is confronted with professional challenges, including technological developments, that affect school systems and teaching. It was also indicated that teaching is a mixture of teacher instructional competencies, the various kinds of knowledge, skills, as well as tools teachers use to execute their teaching plans.

Mishra (2019:1) describes TPACK as the framework through which teachers can apply the different knowledge areas in effectively teaching with ICT.

Historically, teacher education has centred on content knowledge and pedagogy as separate concerns (Roblyer & Hughes, 2019:17). However, through the work of Hughes (2000) and Shulman (1986), the three knowledge domains - technology, pedagogy and content - were combined (Shulman,1987:8). Technological pedagogical content knowledge emanates from the synergy among technology, pedagogy and content knowledge, which differs from knowing the three spheres individually (Koehler, 2009:2). The TPACK model therefore becomes an integral component of pre-service teacher training and in-service teacher professional development for its value and relevance to teaching with technology.

The TPACK framework regards knowledge of technology as an important pedagogic paradigm. This enables educators to incorporate their knowledge of content, pedagogy, and technology in the context of teaching with technology (Foulger et al., 2021:2; Saudelli & Ciampa, 2016:228). Moreover, by embracing TPACK, teachers (and L2 teachers) may employ their skills to infuse educational ICTs into their

instruction (Roblyer & Hughes, 2019:17). For quality teaching, it is therefore important for teachers to be knowledgeable about the interface between these knowledge spheres (Shafie et al., 2019:28). Figure 2.1 provides examples of different types of knowledge involved within a TPACK framework.

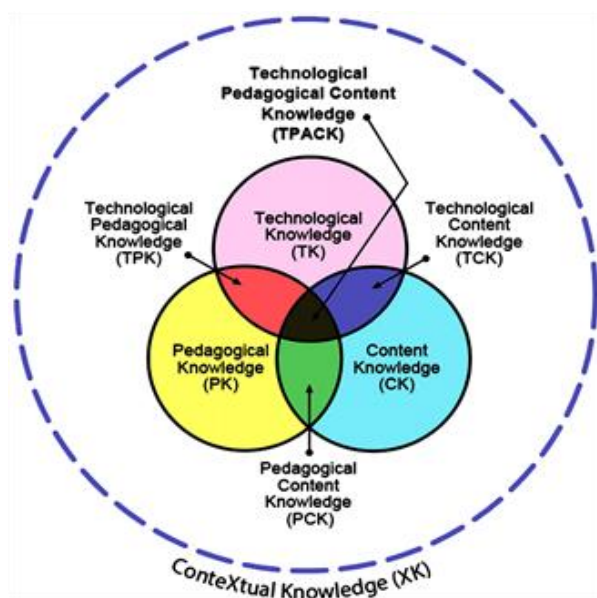


Figure 2. 1: TPACK image (Mishra, 2019:2)

“Contextual Knowledge (XK)” represents the teacher’s knowledge of the context, i.e. the constraints within the organization and work situation of teachers (as discussed under section 2.8). These are material conditions at most public schools that generally impact teaching and learning, and to which EL2 pedagogy is exposed. They include limited internet connectivity, poor training, and professional development of teachers in the instructional use of technology, together with inadequate digital resources and infrastructure at most township schools. The significance of context is noted by Mishra (2019:2), that the success of teachers’ efforts in executing their instructional plans revolves more around how they understand and manage their context than on their technological, pedagogical, and content knowledge and their intersections.

The benefits of pedagogical integration of technology in EL2 instruction are no longer a question (compare Krajka & Alexander, 2021:4; Chang & Hung, 2019:14). The issue to be addressed is *how* teachers (re)present subject matter to learners, using technology designed to specific content in ways that address the particular needs and goals of learners. Equally important is the *extent* to which technology affordances are being leveraged by teachers in bringing about a paradigmatic shift towards 21st-century learning in EL2 classrooms. It is believed that 21st-century learning will offer

learners opportunities to create, manage and share content, think critically, collaborate, and solve problems, using 21st-century skills. Therefore, teachers themselves need to have technology knowledge embodied in TPACK to mediate the learning of these skills by learners (Shafie et al., 2019:25).

The interdependence of the knowledge spheres depicted in Figure 2.1 underlines their importance in enabling EL2 teachers to infuse technology in well-designed and interactive instructional strategies. This knowledge entails harnessing the pervasiveness of smart digital technologies, such as tablets, and mobile phones. According to Mohammed, Assam & Saidi (2020:178), these devices are pertinent to EL2 learning in that they “can facilitate real-time collaboration, long-scale social interaction, creativity, personalization of learning and scaffolding learning activities”. In addition, Mohammed, Assam & Saidi suggest that Web 2.0³ tools, i.e. internet tools used for content creation and social interaction, promote active learning, creating a learner-centred environment. Through this approach, the EL2 teacher becomes a mediator/facilitator who guides the (language) learning process (Mohammed, Assam & Saidi, 2020:179).

The practical application of TPACK should equip the contemporary teacher with knowledge of subject matter principles, content-specific-technologies and decision-making. Consequently, s/he gains the knowledge and uses the ability to tailor-make lessons and present subject matter in ways that talk to instructional goals and pedagogic needs of learners.

While many researchers argue for the instructional benefits of technology, my perspective is using digital tools is not a magical solution to making learning better. For the tools to change and improve learning, other changes need to be considered. One such a change is the attitude and ability of teachers to work with technology. Therefore, if most teachers succeed in integrating technology in EL2 pedagogy to create lessons that speak to the pedagogic needs of their learners, the expectation is that most learners’ performance should likely improve. This expectation is informed by studies conducted by Krajka and Alexander (2021:4) and Chang and Hung (2019:14).

³ Web 2.0- Internet tools which include wikis, blogs, Skype, video sharing, podcasting and social networking sites

In brief, this background provided the context for using technology to support a constructivist pedagogic space to improve learner attainment.

2.3 CONSTRUCTIVISM

Various forms of constructivism are broadly acknowledged within the field of education. Within the sphere of education, two of the most influential proponents of constructivism are Piaget (individual and cognitive constructivism) and Vygotsky (social constructivism) (Roblyer & Hughes, 2019:43).

The basic tenet of constructivism is knowledge construction during learning. Mohammed and Kinyo (2020:92) argue that in a constructivist approach, the learner constructs knowledge from that which is already in his/her knowledge repertoire, as well as from socially interacting with his/her environment. This view supports Piaget's (1976) cognitive constructivism theory, which regarded children as active and constructive beings. It also affirms the teacher's role in developing a climate that promotes discovery learning (Dreyer et al., 2015:43).

As far as learning is concerned, John Dewey (1916) believed that when learners worked together on a task they found interesting, it fostered meaningful learning (Roblyer & Hughes, 2019:44). Consonant with this view, Talebi (2015:5) posits that presenting content within learners' realm of experiences makes teaching and learning more effective. Furthermore, the teacher should act as a facilitator in the learning environment that promotes the child's interest in what is being taught (Demirkol-Orak & İnözü, 2021:992), a view shared by Mohammed et al. (2020:179).

The argument presented above indicates that meaningful learning results from cooperation and collaboration between learners. When learners are actively involved in their learning, it keeps their interest in what they are learning. The fact that the teacher is playing a supportive role, usually gives the learner an autonomous role.

Vygotsky's Zone of Proximal Development (ZPD), which derives from his social constructivist theory (1978), explains the supportive role of the teacher. The ZPD provides teachers with scaffolding opportunities to assist learners to develop their skills and knowledge in the L2 classroom (Yawiloeng, 2021:45), while deploying digital technologies to facilitate learning (Yang, Jiang & Su, 2022:26). Similarly to Dewey's (1916), Vygotsky's approach to learning, advocated developing an autonomous learner, who can cooperate with others. Cooperation, negotiation, and collaboration

supported the co-construction of knowledge. This view of social context to constructivist learning and the value of learners' personal experiences are also shared by Tomljenovic and Vorkapic (2020:13), Dlamini et al. (2018:179), and Badie (2016:294). It adds to creating an active, reflexive, and constructive pedagogic environment for learners (Vandergriff, 2016:29). At the same time, 4IR demands mean that many teachers need to change from traditional modes of teaching to be able to develop learners with the requisite 21st-century skills (Shafie et al., 2019:25).

With educational technologies, the socio-constructivist teaching and learning environment described above, affords a teacher a significant, but pedagogically valuable shift from dominating the pedagogic space to putting the learner in the centre (Crossley & Mcnamara, 2017:19). Today's generation of learners grows up immersed in new technologies, including in educational settings (Bozkurt & Ataizi, 2015:156). As digital natives, they need learning environments and tools that meet their language needs in the digital age. This exposure to digital technologies concomitantly beckons teachers to adopt approaches germane to their learners' 21st-century pedagogic needs. Therefore, these technologies should be applied in various language learning settings to keep up with current insights in the field and deliver learning-centred opportunities (Bozkurt & Ataizi, 2015:160), as provided for in the TPACK model.

In explaining how to implement the model, Dlamini et al. (2018:20) advise that the teacher should start from the point of his or her subject knowledge, and then select an appropriate tool for a lesson on this subject. This tool will inform the selection of relevant pedagogy. Moreover, the teacher should equally consider the extent to which the selected tool will enhance learning, motivate learners, foster collaboration, and contribute towards reaching the learning objectives (Mohammed, Assam & Saidi, 2020:180). I concur, and reiterate that technology on its own does not hold answers to pedagogical challenges. The teacher's knowledge in selecting and using the appropriate tools is as important.

2.4 TPACK AND CONSTRUCTIVISM AS THEORETICAL LENSES FOR THE STUDY

The rationale for contemplating TPACK and constructivism concurrently as the theoretical lenses for the study is aptly expressed in Wang (2005:40):

“Even though constructivism is not a theory associated with using technology, constructivist assumptions are guideposts for developing a vision for integrating technology into the language curriculum.”

The researcher finds Wang’s description still relevant because such assumptions include supporting active learning, enhancing communication, collaboration, problem-solving, cooperation, and learner autonomy (Tomljenovic & Vorkapic, 2020:24; Wang, 2005:40). Together with promoting learner-centred pedagogy, these assumptions are similar to the affordances of technology-based pedagogy described under sections 2.2 and 2.7. In this regard, Bozkurt and Ataizi (2015:160) affirm that constructivist approaches are integrated well into Web 2.0 tools, affordances of which teachers can exploit in EL2 instruction to promote learning-centred opportunities. Bozkurt and Ataizi’s point is well-placed, since it illuminates the support that ICT can give to a constructivist EL2 learning environment. In addition to the competencies cited by Tomljenovic and Vorkapic (2020), and Wang (2005), these tools have been shown to enhance e-learning skills, information production, and information search on the Internet (Muianga, Klomsri, Tedre & Mutimucuo, 2018:51).

Furthermore, the intersection between technology and constructivist learning finds its place in the view that the latter, as a modern pedagogic paradigm (Tomljenovic & Vorkapic, 2020:16), provides many opportunities together with Web 2.0 tools and services to overcome shortcomings of current pedagogical approaches, now considered obsolete (Crossley & Mcnamara, 2017:19; Bozkurt & Ataizi, 2015:162). Roblyer and Hughes (2019:20) concur that long-established, teacher-centred methods are perceived to be failing to build long-lasting knowledge. This position is sustained by several other researchers (compare Yang, Jiang & Su, 2022; Seitz & Hill, 2021; Graham, Stols & Kapp, 2020; Sikhakhane et al., 2020; Shafie et al., 2019; Dlamini et al., 2018; Hussin, 2018; Xu et al., 2018). They maintain that inquiry-based, student-centred, constructivist methods are considered more modern and innovative, leading to higher learning gains. Within the tenets of TPACK, constructivist learning, and using technology to support the pedagogic activity (Shafie et al., 2019:29), afford an

opportunity for teachers to differentiate instruction (Chauke & Tabane, 2021:2; Tarbuton, 2018:5), providing for learners with different learning abilities (Nguyen, 2022:2).

This holds true when considering that learners bring different learning styles and intellectual abilities into the classroom. Part of every teacher's main task in mediating learning is creating a pedagogic environment that accommodates the learning differences of most, if not all, learners. The ideal to maximise every learner's learning potential. To achieve this with the support of technology corroborates Dewey's view on cooperative learning, and both Vygotsky and Piaget's view on learners as active participants in the learning. Through project-based learning, learners can work on projects of varying complexity using digital tools. Moiko, Predyk, Bakhmat, Kravchuk, Streletska and Zakharova (2022:205) assert that projects help develop learners' digital and research skills, collaboration, and communication skills.

2.5 NATIONAL CURRICULUM STATEMENT (NCS)

The National Curriculum Statements (NCS) represent the South African National Curriculum for Grades R-12. One of its aims is to develop effective science and technology skills in learners (NCS, 2012:4).

Functionally, the NCS is implemented via CAPS, which encourages text-based, communicative, integrated and process-orientated approaches to language instruction (DBE, 2012:9). The four skills - listening, speaking, reading and writing - are meant to be reinforced in the senior phase, with emphasis on the use of the L2 to develop learners' interpersonal and cognitive skills. These skills are needed in studying other subjects, like Technology and Mathematics, and form the basis of how learners perform in the senior Grades 10, 11 and 12.

While it is not within the scope of this dissertation to critique the CAPS (as the functional document of the NCS), it is worth highlighting that it (CAPS) makes no provision for the functional integration of technology in EL2 pedagogy at the senior phase. Neither does it give any guidance to teachers regarding implementing technology-based ELT pedagogy. At the same time, the aforementioned language competencies that learners should have developed in their L2 at this level, are still lacking (DBE, 2012:9). What is more, the annual National Senior Certificate (NSC)

2023's diagnostic report⁴ points to many language deficiencies among 12th grade EL2 learners, such as lack of vocabulary, inability to interpret questions and, lack of analysis and comprehension skills (DBE, 2023:17). Figure 2.2 below presents 12th grade learner's performance in the different topics of English paper 1. In the secondary school, it is logical to infer that the learners have traversed both the preceding intermediate and senior phases with this burden of L2 deficiencies.

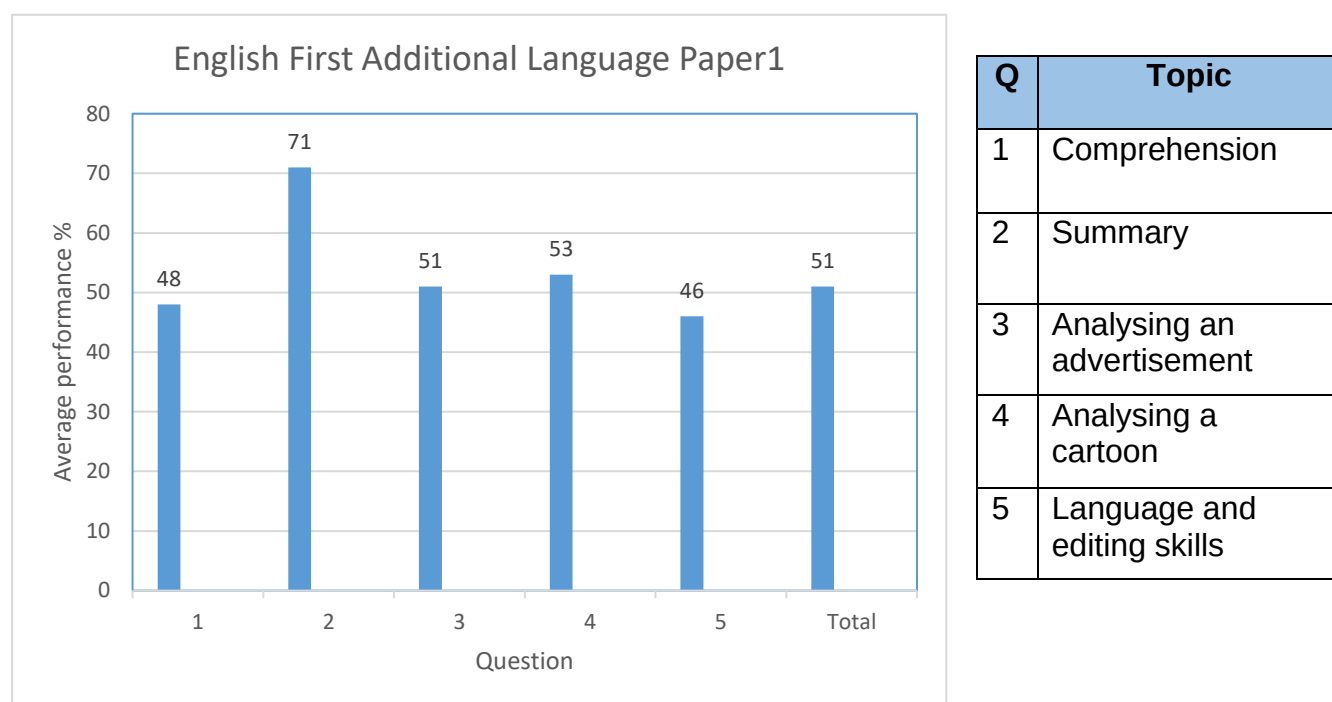


Figure 2. 2: Average performance per question in Paper 1 (Adapted from NSC Diagnostic Report 2023- Part 2)

Admittedly, the communicative, integrated approach to EL2 pedagogy advocated by CAPS, is appropriate. Today, more prominence is given to communication, marked by the change from language 'analysis' to language 'use'. In language use, the focus is more on the application of language in authentic, communicative contexts, as opposed to concentrating on the form and structural components of language in language analysis. The shift from the latter to the former allows a greater emphasis on interaction (Kaya, 2015:3), in support of current innovative approaches to EL2 instruction. Communication and collaboration are regarded as valuable means of being part of constructivist language learning activities.

⁴ NSC 2023 diagnostic report is an annual national report on 12th grade candidates' performance in each of the identified subjects.

Therefore, to develop science and technology savvy learners espoused by the CAPS, clear implementation guidelines on a constructivist approach to EL2 pedagogy are needed. These guidelines should not only encourage, but support inquiry-based, student-centred methods (Roblyer & Hughes, 2019:20) needed in the senior phase EL2 classrooms. Furthermore, in contrast to traditional, teacher-centred methods generally still in use by EL2 teachers (Hart, 2023:10), such guidelines would help create an academic environment in SA senior phase EL2 classrooms, which would nourish an instructional approach conducive to the pedagogic integration of technology.

2.6 THE STATUS OF ENGLISH IN SA

English language is dominant in the SA school system (Chetty, 2019:246). In SA, many learners and their parents appreciate the benefits associated with fluency in English (Stein, 2017:215). Stein notes that the use of English is commonplace in tertiary education and employment. As a result, learners whose LoLT is not English choose English as L2. In that way, they believe they are 'forced' to be fluent in English.

It is important to understand that the L2, compared to first language (L1), denotes a language other than a mother tongue, but has certain social functions (DBE, 2012:8). As a L2 it is, in other words, a language learnt or developed after the acquisition of the first language or mother tongue (Aljumah, 2020:200). In SA, the L2, also referred to as English First Additional Language (EFAL), functions as the LoLT in education (DBE, 2012).

Notwithstanding, recent large-scale assessments conducted in SA, point to poor learner achievement, even with extra resources in education and some progress, and language is reported to have an impact (Prinsloo, Rogers & Harvey, 2018:1).

Mahlaba's (2020:2) study on the state of SA mathematics education, and Reddy, Winnaar, Juan, Arends, Harvey, Hannan and Namone (2019)'s Trends in International Mathematics and Science Study (TIMSS) report revealed that learners' success in Mathematics depended largely on their aptitude in English. In the PIRLS reports, Howie, Combrink, Roux, Tshele, Mokoena and Palane (2017), as well as DBE (2023:4), the low achievement among SA learners is attributed to language-related factors. For SA, PIRLS 2021 exposed alarmingly low levels of performance in learners' reading comprehension.

Before it was discontinued in 2015, key findings from the 2013 Annual National Assessment (ANA) Diagnostic Report, exposed an array of language deficiencies among Grade 9 EL2 learners (DBE, 2013:52). The 2014 Grade 9 ANA analysis of results in EL2 revealed a performance rating of a 34% average of the sampled learners. The highest average, 43%, was for reading and viewing, with writing and presenting at 37%. The lowest average, 22%, was scored in language structure and conventions (DBE, 2014:36). This trend has persisted to the current day in the SA EL2 education era, manifesting itself yet again in the 2023 matric candidates' performance in EL2 as reported on in that year's diagnostic report.

Prinsloo et al. (2018:1) and DBE (2012:8) emphasise that competency in L2 is a fundamental requisite for learners to succeed in further academic studies. This competency means learners should possess sound writing and reading skills. Using an example of science as a language-based subject, Gonzalez-Howard and McNeill (2016:46) posit that language is key to attaining scientific literacy, being knowledgeable about and understanding the relevant content. Besides that, greater emphasis is required on using L2 to cultivate learners' Cognitive Academic (Language) Proficiency (CALP), needed in studying their other school subjects (DBE, 2012:9). CALP (Cummins, 1979:198) is that aspect of language competence closely connected to cognitive and academic skills. Therefore, learners' competence in English L2 has other implications in their academic achievement since it impacts immensely on their reasoning and thinking abilities.

NSC Diagnostic Reports (DBE, 2023; 2022; 2020) link learners' language barriers with poor comprehension skills. The reports acknowledge that in content subjects, like Accounting, Agricultural Sciences, Geography and Physical Sciences, the language of instruction (English) is proving to be a challenge to most of the candidates, as they were unable to respond appropriately to the instruction verbs used in questions, lacked the relevant vocabulary, and did not have the required reading and language skills (DBE, 2023:15; 2022:18; 2020:39). The reports further recommend that language and comprehension skills must be developed in each classroom, across subjects, and stress that language across the curriculum is the core of the learning for learners. In addition, platforms, such as ChatGPT, YouTube, Google Classroom, Zoom, Microsoft Teams and WhatsApp are recommended for online and virtual study groups (DBE, 2023:13; 2022:9) for "revision activities and examination preparations".

The above motivates the argument for considering the use of technology to usher in a constructivist pedagogic approach in SA senior phase EL2 classrooms. When language instruction is supported with technology, the four components of literacy - listening, speaking, reading and writing (Chetty, 2019:249) - are commonly targeted, and so too are vocabulary and grammar (Chun, Kern & Smith, 2016:72). They are the fundamental components of L2 learning, essential in developing the literacy skills apparently lacking in SA EL2 learners. With educational technologies, these components can remarkably enhance students' literacy education and academic attainment (Chang & Hung, 2019:12; Crossley & McNamara, 2017:20). For this reason, it follows therefore that learners' linguistic competence can be regarded as a precondition for learners to perform well in content subjects (DBE, 2015:10).

With the immense potential that technology holds, if integrated effectively into English L2 pedagogy, the researchers posit that possible risks associated with using technology in EL2 pedagogy, far outweigh the convenience of allowing the conditions that perpetuate the status quo, as explained above. Furthermore, the status quo means learners in the senior phase are unable to meet language standards required in further grades - as evidenced in the NSC diagnostic reports - or the level of proficiency expected for tertiary education or in employment.

In conclusion, the importance of EL2 in SA's basic education system was highlighted. Learner achievement in EL2, both in national and international studies, revealed poor performance among SA learners. The section also underlined the significance of teachers' technology, pedagogy and content knowledge in employing learner-centred, constructivist instructional strategies as a response to learners' 21st-century educational needs.

2.7 IMPACT OF TECHNOLOGY

2.7.1 Digital pedagogy

Technology is a key component of digital pedagogy (Nanjundaswamy, Baskaran & Leela, 2021:181). Digital pedagogy, summarised in Figure 2.3, is deemed part of an approach referred to as 21st-century pedagogy, which gives educators an opportunity to lead learners into a world of technology (Dlamini et al., 2018:17). Vääätäjä and Ruokamo (2021:2) refer to digital pedagogy as the ability to infuse ICTs into pedagogy so that they enrich instruction, learner assessment and curriculum. As already

explained under TPACK, the pedagogic infusion of digital technologies in education is believed to promote collaboration and encourage creativity and problem-solving among learners. According to Nanjundaswamy et al. (2021), it encourages a constructivist approach to English L2 instruction. Along with this view, Lazarov (2018:13) and Xu et al. (2018:91) respectively acknowledge that the skills acquired through digital pedagogy, prepare learners with different unique abilities needed for success in employment and life, and more importantly, in the 4IR.

While technology has arguably revolutionized education and offers numerous benefits, it should not be viewed as the panacea for pedagogic challenges. The power of technology cannot replace the skill, empathy, and commitment of teachers, with whom learners build academic rapport and personalised relationships. There are vast amounts of digital information and content accessible to learners which require the teacher's guidance and contextualisation of the content to curriculum objectives.

Another pedagogical consideration is that the use of technology does not naturally translate to effective pedagogy. Some obstacles for teachers (described in more detail under section 2.8) include: (1) having to integrate digital tools in instruction with inadequate resources, technical support and time; (2) teachers' own perceptions about ICT and its benefits, ability and level of development in manipulating digital tools and classroom practices. Adequate teacher training and continuous professional development are prerequisites for sound instructional ICT integration. On the other hand, learners may not possess adequate levels of digital literacy skills to locate materials, evaluate, select, and manipulate information, and use the tools to create and present the information. Apposite training and preparation of learners beforehand is therefore necessary before any ICT integration project can be implemented. ICT integration should also be complemented by strong pedagogic frameworks and informed by the relevant policies.

In a nutshell, Figure 2.3 summarises the skills and competencies required by teachers and learners in the 21st-century. In addition, it depicts technology affordances, e.g. communication, problem-solving, project-based teaching and timely feedback that both learners and teachers can benefit from integrating technology in EL2 constructivist-based lessons.

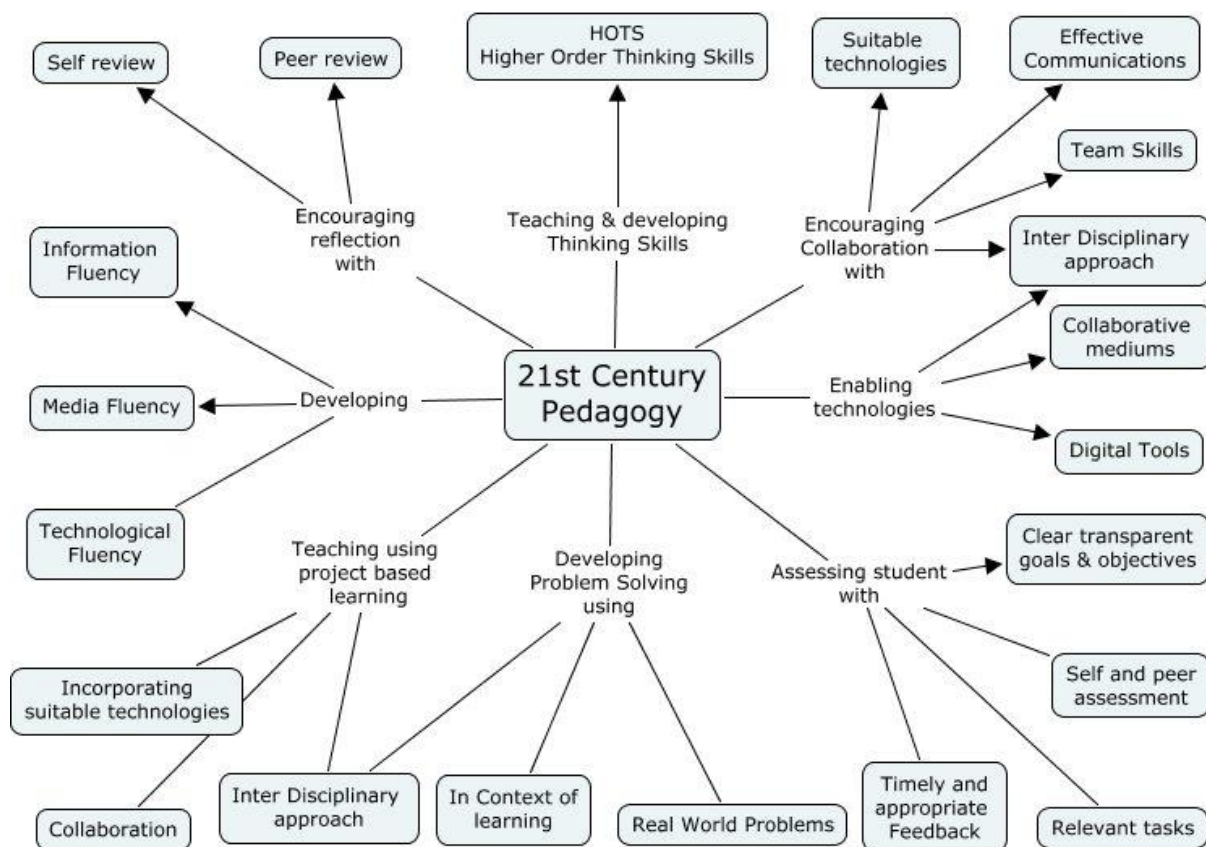


Figure 2. 3: Twenty-first century Pedagogy (Adapted from TeachThought, 2018)

Pedagogic integration of ICT has gained much significance to improve pedagogic outcomes, learner interaction, flexibility and ubiquitous learning (Lawrence & Tar, 2018:80). Technology affords learners an unrestricted choice of learning content, time and space, which gives them autonomy and greater independence (Chisango et al., 2020:2), a feature of 21st-century learning. Congruently, in an EL2 learning context, the integration of ICT supports the constructivist assumptions, as cited under Wang (2005:40), and denoted in Yang et al. (2022:26), Mohammed and Kinyo (2020:92), Tomljenovic and Vorkapic (2020:24), Roblyer and Hughes (2019:44), Shafie et al. (2019:25) and Crossley and Mcnamara (2017:19). Equally significant, EL2 teachers have the prerogative as instructional leaders to see that digital pedagogy practices are enacted within their classrooms. Along with this, the change in senior phase EL2 pedagogy is expected, marked by an improvement in the learners' performance.

2.7.2 Digital literacy

Digital literacy includes skills, knowledge and behaviours that we use with various digital tools, such as smartphones, laptops, tablets and desktop computers (Gerhhard, 2017:115). Digital literacy is considered integral to the integration of ICT in education

(Yildiz, 2020:470). According to the UNESCO ICT Competency Framework for Teachers (2011:3), it is one of the key competencies teachers require to integrate ICT in the curriculum. Several studies (compare McGarr & McDonagh, 2019; Surmelioglu & Seferoglu, 2019; Carretero, Vuorikari & Punie, 2018; Kurniawati, Maolida & Anjaniputra, 2018; Kaya, 2015) highlight the significant role of digital literacy in education.

To effectively use the various pedagogic tools in their lessons, teachers and students require appropriate levels of digital literacy (Dhillon & Murray, 2021:2). It involves being technically competent and able to utilize technology effectively to locate materials and collaborate broadly through different human contexts.

Digital literacy skills give learners a competitive edge over other individuals with time (Yildiz, 2020:470). These skills enable them to: (1) manipulate information (Yildiz, 2020:471; Roblyer & Hughes, 2019:19), (2) critically evaluate the essence of messages in digital media (Niemi, Shuanghong, Vivitsou & Baoping, 2018:335), (3) use digital tools for creating and presenting information (Niemi et al., 2018:335) and (4) show legal and ethical understanding of how digital technologies are used (Roblyer & Hughes, 2019:20). By being critical consumers of technology resources, students can use technology resources in safe, responsible and legal ways. Digital literacy skills enable students to benefit from affordances presented by the digital pedagogy environment through their acquired ability to use digital tools effectively. Equally, teachers can integrate the digital tools to mediate teaching and learning, thereby creating the constructivist pedagogic environment required of effective EL2 instruction.

The foregoing highlights the significance of digital literacy within the digital pedagogy scenario. However, it is important to also remember that there are opportunities and challenges that digital technologies bring in, which have an impact on the uptake of technology in L2 instruction.

2.7.3 Uptake of ICT tools in L2 pedagogy

The United Nations Educational, Scientific and Cultural Organization (UNESCO), recognizes that the innovative use of technology in the curriculum has a broader impact on social and economic development (Chimbunde & Kgari-Masondo, 2022:8). The UNESCO ICT Competency Framework for Teachers (2011:3) identifies the

competencies and criteria for teachers in using ICT in the curriculum, as shown in Table 2.1.

Table 2. 1: The UNESCO ICT Competency Framework

THE UNESCO ICT COMPETENCY FRAMEWORK FOR TEACHERS			
	TECHNOLOGY LITERACY	KNOWLEDGE DEEPENING	KNOWLEDGE CREATION
UNDERSTANDING ICT IN EDUCATION	Policy awareness	Policy understanding	Policy innovation
CURRICULUM AND ASSESSMENT	Basic knowledge	Knowledge application	Knowledge society skills
PEDAGOGY	Integrate technology	Complex problem solving	Self management
ICT	Basic tools	Complex tools	Pervasive tools
ORGANIZATION AND ADMINISTRATION	Standard classroom	Collaborative groups	Learning organizations
TEACHER PROFESSIONAL LEARNING	Digital literacy	Manage and guide	Teacher as model learner

(Source: UNESCO, 2011:3)

The framework identifies six key areas or criteria of ICT competency, and the various levels of application. It reports on the basic characteristics of professional teachers in relation to digital skills (Dlamini et al., 2018:141). The key areas and the different levels of application are closely related to 21st-century pedagogy skills and competencies, referred to in Figure 2.3.

The central role that technology plays in the growth and development of many countries, is broadly accepted. Consequently, several countries have devoted resources in school ICT programmes. One example is the ICT Transforming Education in Africa-UNESCO KFIT-Project. This is a UNESCO programme implemented in several African countries - Mozambique, Rwanda and Zimbabwe - from 2016 to 2019. Phase two of the project, from 2020 to 2023, is being carried out in Côte d'Ivoire, Ghana and Senegal. The project is meant to improve learning outcomes and the development of 21st-century competencies through the appropriate integration of digital tools by teachers (UNESCO, 2015). Other countries with similar programmes, include Chile's systematic educational technology development (Crossley & Mcnamara, 2017:24), Malaysia's system-wide Smart School Qualification Standards (Ministry of Education Malaysia, 2013) and Singapore's Masterplan, aimed at universal access to ICT by all learners (Infocom MDA, 2018).

The DBE has also adopted technology to enhance the level of education in SA (Graham et al., 2020:749). Moreover, the DBE has formed various strategic partnerships with other organizations to advance ICT-in-education programmes in public schools. There are, for example, Vodacom e-School, which provides gratis access to digital learning materials, educational resources and support services for R-12 schools (Joosub, 2023:3), Microsoft digital skills training for education assistants to support teachers and learners with digital skills (DBE, 2021), as well as MTN Foundation's MTN Online School, a cost-free e-education portal and the Vodacom Foundation's Virtual Classroom, which offers learners and teachers connectivity and digital skills.

There are various interpretations of the meaning of integrating educational technology. However, EL2 teachers can draw from Roblyer and Hughes (2019:4), who aptly define educational technology integration as a process where an individual or, in collaboration with others, embark on: (1) identifying an instructional problem (e.g. lack of learning/teaching materials, challenging topics), (2) identifying ICT resources as potential solutions, (3) using ICT resources to support learning as educational technology in the learning environment, and (4) assessing or evaluating the various ways in which the educational technology addresses the instructional problem in the interest of teaching and learning. Roblyer and Hughes' definition aligns well with Dlamini et al.'s (2018:20) advice to teachers on implementing the TPACK model, namely that they should start from the content knowledge, and then go on to find the most suitable digital tool to infuse into the lesson. The selection of appropriate pedagogy will be determined by the selected tool.

Technology in L2 pedagogy is often used to locate resources for instructional purposes. Web pages, videos and podcasts are realistic language forms for instructional reading and listening activities. In communicative L2 pedagogy, these activities can be facilitated by means of technologies, like smart phones and computers (described in more detail under section 2.10) through which realistic language use can be accessed. In addition, L2 educators can source authentic material from the Internet to integrate into ICT-enriched, learner-centred instruction. Vandergriff (2016:23) advances that besides language learning, Web 2.0 possesses the greatest potential to improve interaction among participants in language learning contexts. Furthermore, it promotes linguistic interphase and communication over a

wide spectrum of contexts and purposes. Particularly for L2 learning contexts, incorporating technology in EL2 pedagogy makes a significantly large impact on students' language acquisition and academic performance (Lasut, 2023:418; Chang & Hung, 2019:12; Dianti & Atmanegara, 2019).

Nonetheless, several studies (compare Dlamini et al., 2018; Kurniawati et al., 2018; Young, 2018; Suherdi & Mian, 2017) have revealed that, despite educational technology being at the disposal of educators at schools, and while many teachers are aware of the various ways using technology can benefit them and their learners, integrating ICT in classrooms, was limited. Adegbenro, Gumbo and Olakanmi's (2017:79) study on SA secondary school teachers' technology integration needs, revealed that ICT resources that were supplied to the schools made a negligible effect on how teachers deployed them in their lessons. There may be several contributory factors to the poor uptake of the ICT tools, but as Marcelo and Yot-Domínguez (2019:983) discovered, providing apposite training and Teacher Confidence were apparent determining factors to teachers' integration of ICT.

Although the infusion of technology in the curriculum may arguably provide a means to empower young people with knowledge and skills, it does, however, not simply occur by installing the necessary infrastructure. From the above, it can be inferred instead that the knowledge and skills are a product of transformative processes, related to human and educational activities within the school community.

In brief, the foregoing has highlighted the rationale for the uptake of digital tools in second language pedagogy, signposted against The UNESCO ICT CFT. It examined different ways in which countries have invested in ICT-in-school programmes to improve pedagogic ICT integration. Integration of technology in L2 instruction was explained, with reference to the ability of Web 2.0 tools to promote interaction and foster collaborative learning in language-learning contexts.

2.8 CHALLENGES ASSOCIATED WITH INTEGRATING TECHNOLOGY IN THE EL2 CLASSROOM

Integrating technology brings certain challenges to teachers in building a productive learning environment. These challenges represent the factors which impact the educational integration of ICTs in EL2 instruction. Teachers face both external and internal challenges. The former include access to resources, training, and support

(Sabiri, 2020:182; Alhumaid, 2019:16; Louw, Rankhumise & Maimane, 2019:305). The latter comprise teachers' attitudes and beliefs (Dianti & Atmanegara, 2019:486; Adegbenro et al., 2017:85), resisting technology in teaching, and aptitude (Hart, 2023:10; Sabiri, 2020:182; Lawrence & Tar, 2018:83).

The issue of access pertains to the lack of ICT tools or the internet. Louw et al. (2019:305) suggest that inadequate provision or absence of the above from schools, means that teachers cannot teach with ICT. Poor access to or unavailability of resources, therefore, becomes a barrier hindering the uptake of technology by teachers. A study by Lawrence and Tar (2018:99), resisting technology in teaching, and aptitude (Hart, 2023:10; Sabiri, 2020:182; Lawrence & Tar, 2018:83).

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Dlamini and Dewa's (2021:30) study to investigate the status and use of ICTs in SA schools, revealed scant teacher professional development and training in pedagogic integration of ICT. Implications for the lack of apposite training and development means teachers are unable to use technology optimally. This has negative connotations for the implementation of TPACK, with similar implications for EL2 instruction in the classroom. Providing teachers with ICT support, helps them concentrate more on mediating instruction for the benefit of their learners than worrying about ICT inadequacies (Crossley & Mcnamara, 2017:14).

A typical scenario that exemplifies the support teachers lack in integrating technology, was present at one of the sampled schools. The school became a smart school by the Provincial Department of Education. Requisite infrastructure and hardware were put up in every class -- digital projectors, whiteboards, and laptops -- issued to all educators. Relevant software was also installed on teachers' laptops. However, there was no support from the district in terms of capacitating the SMT and monitoring the implementation of the programme, coupled with inadequate teacher training. Thus, the ideal of the smart school remained partly fulfilled. What the foregoing suggests is with minimal support, resources on their own will not bring about change in technology integration.

Congruent with the foregoing, a review of the literature conducted by Groff and Mouza (2008:23), produced six key aspects influencing innovative ways for teachers' instructional integration of ICT (Figure 2.4). Groff and Mouza admit that despite their importance, some factors are beyond the control of teachers, such as legislative and technological factors.

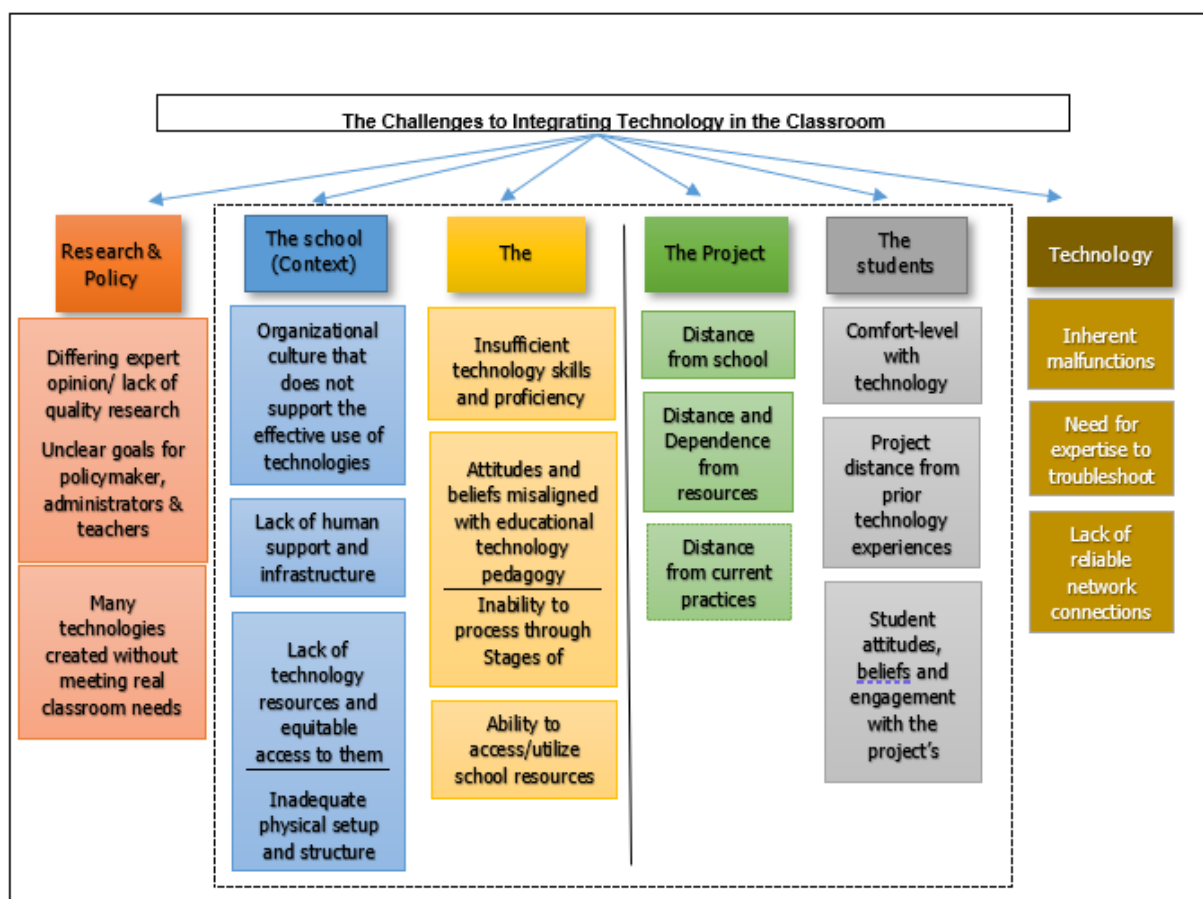


Figure 2. 4: Challenges to Classroom Technology Integration (Adapted from Groff & Mouza, 2008:24)

Muianga et al. (2018:52) concur that students' attitudes and beliefs, level of technology knowledge and lack of experience in learning technology, acted as challenges to technology integration. Other factors, such as those associated with the student population, are within the teachers' field to manipulate or address to expedite the integration of ICT (Hove & Grobbelaar, 2020:48). Teacher's lack of ICT skills and low confidence (Dlamini & Dewa, 2021:33; Hove & Grobbelaar, 2020:56) were also found to be serious inhibitors. Teachers also raised the limited time for practical application of ICT integration in their lessons (Lawrence & Tar, 2018:97).

Collectively and in isolation, these challenges are not only critical to the purpose and aim of this study, but they are also fundamental factors for shaping the 21st-century educational technology landscape, lucidly alluded to under section 2.7.1, namely digital pedagogy. Following the above, the researchers herewith posit that the affordances that infusing technology create for L2 teachers, should be taken advantage of by the teachers themselves, supported by administrators and school managers. In this light, teachers should be adequately trained and teacher

development initiatives undertaken to create an environment that can expedite integrating technology effectively in English L2 classrooms.

2.9 TEACHERS' KNOWLEDGE, SKILLS AND ATTITUDES TOWARDS ICT INTEGRATION

Teachers in the main appreciate the advantages of instructional ICTs, despite the challenges in effectively integrating technology.

The discussion on the TPACK model explained the theoretical perspective for designing and implementing effective technology-enriched pedagogy. In a study intended to understand how TPACK spheres and the behaviour of teachers in ICT integration related, Dikmen and Demirer (2022:398) discovered that especially, teachers' TK, TCK, TPK, and how CK and PK interact with TK, plus their self-belief, outlook on opportunities, and enthusiasm, impacted whether they used technology to teach. It followed that teachers having higher levels of TPACK had more interest in instructional technologies, better outlook on opportunities presented by teaching with technology and their intentions to teach with technology increased.

The foregoing resonates well with the main research question, which aims to determine the factors that impact ICT integration in 8th and 9th grade EL2 classrooms.

In support of the value added by digital literacy, TPACK and attitude, Raygan and Moradkhani, (2020:47) argue that advanced levels of both digital literacy and TPACK, and teachers' positive attitude promote greater ICT integration.

Findings from a study by Louw et al. (2019:308) on using technology to improve instruction in SA schools, revealed that teachers' attitudes, beliefs, skills and knowledge are crucial factors in integrating technology. Lawrence and Tar's (2018:93) study made similar findings. Results also showed that teachers' ICT skills, attitude and knowledge, expedite use of ICT. This discovery is also acknowledged by Rwodzi, De Jager & Mpofu (2020:7) in an English language learning context.

Dlamini and Dewa (2021:25), Sabiri (2020:182) and Padayachee's (2017:47) work established that teachers' ICT use was generally restricted to slide show presentations and word processing. The use of ICT to integrate interactive content and internet-based activities, was very low. These studies also conceptualised that teachers' TPACK positively correlated with their ICT usage, in this way corroborating the point made by Dikmen and Demirer (2022:398), and Dhillon and Murray (2021:2).

Appropriate levels of digital literacy equip teachers with a repertoire of digital skills, which assist them to function with digital technologies. Digital technologies in the current study are perceived as digital texts (e.g. online articles), digital pictures, videos and podcasts (Churchill, 2016:21). Teachers should thus be able to locate human and digital resources to assist them to make a success of implementing technology integration (Groff & Mouza, 2008:31).

Ndlovu and Mall's (2016:125) research showed that teachers in the inquiry had their individual perception of technology integration, which impacted what they practised. On one hand Sabiri (2020:182) and Marcelo and Yot-Domínguez (2019:983) found teachers' confidence and providing them with the right training as vital factors in teaching with technology. At the same time, teachers' degree of ICT usage corresponds with their level of technology use. Their confidence in using technology in teaching grows parallel to how they use ICT. Dlamini and Mbatha (2018:27) motivate that confidence is important in teachers adopting and integrating educational technologies. Practice, as with any skill, affords teachers an opportunity to gain familiarity with digital tools (Dhillon & Murray, 2021:16), and as such, familiarity breeds confidence.

As with any new role, teachers' apprehension about the use of technology in teaching also emanates from uncertainty about the pedagogical outcomes of integrating technology, as well as the resultant technophobia. These are aggravated by the fear of failure, erupting from curriculum-driven pedagogy as noted in DBE (2015:37). From the researcher's personal work experience, many teachers regard themselves as *BBTs* (Born Before Technology). This expression is synonymous with the phrase *digital immigrants*, cited under section 2.8, to reflect that they grew up with no computers and might, as a result, not be aptly eloquent with ICT, compared to their learners, younger counterparts and other colleagues.

Dlamini and Dewa (2021:33) have already pointed out the implications of teachers' lack of apposite professional development and training in integrating instructional technologies in many SA public schools. The situation described by Dlamini and Dewa could very well be the cause of the condition defined by Adegbenro et al. (2017:79) as 'negligible deployment of ICT resources by teachers in their lessons'. This is in view of Marcelo and Yot-Domínguez's (2019:983) postulation that suitable training is necessary to build the confidence that teachers need in teaching with technology. In

the absence of this, mediating English instruction with technology in senior phase classrooms remains a challenge as much as it constrains the creation of constructivist learning conditions.

Computer-supported instruction requires teachers to challenge their current pedagogical perceptions, and change from being in the centre to mediators of learning. This change supports Dlamini et al.'s (2018:179) view, described earlier, that constructivist-based-instruction creates an environment for active learning. Groff and Mouza (2008:30) agree that the change is accelerated by more use of ICT by teachers and a related increase in ICT proficiency.

In summary, this section described teachers' social cognitive variables related to TPACK. It underscored teachers' knowledge of technology and technical skills, their degree of digital literacy, attitudes and beliefs.

In the next section, the various types of digital technologies and their pedagogical affordances within the English L2 teaching and learning context, are discussed.

2.10 TYPES OF DIGITAL TECHNOLOGIES AVAILABLE AND THE EXTENT TO WHICH THEY ARE USED IN MEDIATING ENGLISH L2 PEDAGOGY

There exists consensus among researchers that affordances of technology can be harvested towards enhancing learning competencies of students (Buckley-Marudas & Martin, 2020:246; Smith, 2019:20; Vu, Warschauer & Yim, 2019:9) in various ways.

To work productively with digital technologies, a teacher must first establish which hardware and software resources are available at school and in the classroom. In addition, the type of resources and the extent to which the teacher uses them in mediating instruction in the English L2 classroom, should be guided by the salient points of Roblyer and Hughes' (2019:4) definition of educational technology integration: detecting the existing pedagogical challenge, selecting the appropriate pedagogic tool/s to use and determining the pedagogic efficiency of the tool.

This section outlines a range of configurations of hardware devices for teaching and learning, and software tools that support classroom activity for teachers and students.

Seven types of technology hardware commonly used in modern-day schools are identified by Roblyer and Hughes (2019:101) as:

- Wired or wireless networks that enable internet, e.g. dial-up, ethernet or wi-fi.
- Personal computers, e.g. Laptop or desktop computers.
- Portable devices for collecting and processing data, e.g. tablets and smartphones.
- Display devices that present information in visual form, e.g. an interactive white board, monitor, and data projector.
- Image-creating or editing technologies for visual data, e.g. a scanner and image processor.
- Peripheral input or output devices to extend computing devices' functionality, e.g. a digital camera, optical scanner, video camera, speakers and printer.
- External storage devices or cloud services that store data, e.g. a hard drive and cloud storage.

The above present a wide variety of digital tools that are accessible to EL2 teachers and students. Additionally, there are services on the Internet, such as email and X (formerly Twitter) and are connected to websites, while other tools, Gebhard (2017:117) notes, are computer programs that allow teachers and students to use in creating their own resources.

There is apparent agreement (compare Mohammed et al., 2020:179; Caruso, 2018:89; Vandergriff, 2016:21) on the educational benefits of Web 2.0 technologies and the positive impact thereof in L2 learning contexts. Caruso (2018:89) and Vandergriff (2016:21) identify Web 2.0 tools, such as social-networking sites (Ning, MySpace), video sites and sites for sharing content (Digg, Flickr, You Tube and RSS readers), content creation and editing websites (Google Docs and Wikipedia) and search engines (Google, Bing and Wiki.com), which facilitate L2 learning through online collaborations between cultures, online learning tasks, and language-learning networks, such as WhatsApp and *Facebook* groups (Rwodzi, De Jager & Mpofo, 2020:4). These activities and tools support a constructivist learning environment, which permits content sharing and collaboration among learners, a fact acknowledged by Mohammed, Assam & Saidi (2020:179).

Below is Gebhard's (2017:117) consideration of some of these tools (email, X, blogging, wikis, and digital storytelling) and how teachers and students can use them, as well as insights from other authors.

2.10.1 Email

Email allows students, teachers and colleagues to communicate over a period of time, as well as capturing the history of the interactions, allowing for collective knowledge to be more easily shared and dispersed.

2.10.2 X

Through X, learners can use English to communicate with each other through short messages, as well as images. Learners can follow topics they like, and contribute to an ongoing discussion, and to write about what they learn, either as an essay or in a blog.

2.10.3 Blogging

Blogging is among the most useful technologies for EL2 pedagogy. Learners can log onto public blogs to read and comment on entries written by the owner of the blog or others. Being able to have multiple authors, provides students with opportunities to make a blog a part of a collective classroom group project.

2.10.4 Wikis

A wiki allows users to edit content by using a web browser. The functional convenience of Wikispaces.com allows teachers to have classroom wikis that are advertisement-free. It allows interaction and collaboration between teachers and learners. A well-known and popular wiki is an online dictionary known as Wikipedia, capable of being updated by anyone online.

2.10.5 Digital storytelling (DST)

DST is a multimodal digital literacy, and an easy form of digital media production that provides learners with the means to create video with sound, animation, photos, and other electronic media.

DST has been integrated in many different settings. It is recognized in education as an effective pedagogic tool in supporting the different kinds of literacies, including digital literacy (Abderrahim & Gutiérrez-Colón Plana, 2021:43). Collaborative writing (Chubko, Morris, McKinnon, Slater & Lummis, 2020:3599) and video-making

(Buckley-Marudas & Martin, 2020:10; Chubko et al., 2020:3599; Zellner 2018:142) have been identified as some of the benefits learners derive from integrating DST in EL2 pedagogy. There are also reports of how students' presentation and writing skills have improved (Niemi et al., 2018:332).

2.10.6 Cell phones

Silvia and Bodea (2016:26) recognize the instructional value of cell phones as e-learning tools, ideal for the learning of vocabulary and grammar through applications, games, videos, music, books, and other materials. For example, learners may access an online dictionary, Google or a blog that is related to the lesson from their cell phones in class. They may also use their cell phones to practise making phone calls in English, while doing role-play activities.

In addition, Silvia and Bodea (2016:26) regard YouTube as the broadest library of video material, containing good examples of real language use. Users have the benefit of not only watching videos, but can also download them and make comments. EL2 teachers can use downloaded video content in class to promote competencies, like viewing and listening.

In summary, these technologies allow EL2 teachers and learners to share their stories over different electronic sharing systems. Simultaneously, teachers and learners can use the same technology to learn English and gain digital literacy. Materials from social media allow learners to collaborate and learn language through real interactive ways.

2.11 WAYS IN WHICH TEACHERS CAN BE ASSISTED TO USE TECHNOLOGY IN EL2 PEDAGOGY

To address the demands of the new era of technology, the DBE developed The Action Plan to 2019: Towards the Realisation of Schooling 2030. In it are embodied several goals for professional development and integration of digital tools to “enhance teaching and learning.”

Teachers' role in teaching with ICT cannot be overemphasised. For that reason, they are expected to use ICT to improve the classroom environment to support learner-centred learning.

Their own skills inadequacy and inexperience, described in detail in section 2.9, are usually the causes for teachers not integrating ICT in their classrooms. Studies (Dlamini & Dewa, 2021:30; Chisango et al., 2020:16; Louw et al., 2019:308) support

the view that effective professional development and training need to provide time for teachers to be trained, to experiment, as well as receive on-going support in creating innovative ways of teaching. The foregoing is particularly pertinent in the SA basic education context, especially in township schools plagued by learner underperformance.

The resources and support that teachers require are: (a) adequate computer equipment (Lasut, 2023:418; La Fleur & Dlamini, 2022:6); (b) technical and pedagogical support (Hart, 2023:13; Dlamini & Mbatha, 2018:28); (c) time for training and development (Dlamini & Mbatha, 2018:18); and (d) mentoring and support from colleagues (La Fleur & Dlamini, 2022:16). Teachers need support in identifying and locating the resources that can provide the help they need for the success of the technology project at school.

Professional development is in part also the responsibility of the educator, a view also advocated by Dlamini and Dewa (2021:30). As a lifelong learner, an educator should ardently participate in activities, which foster professional growth and skill development. This can be done through membership to professional bodies, involvement in conferences, and participation in training opportunities. S/he should try new teaching approaches and learner-centric methods that arm learners with 21st-century skills and knowledge. In this manner, the educator also manages to stay relevant in the face of dynamic developments in the profession, instigated by ICT.

In summary, this section has looked at several ways in which educators can be supported in integrating ICT into EL2 pedagogy. These initiatives need to be organised for serving educators at district and school level. Together with other teacher training opportunities, they can assist both EL2 novice and experienced teachers to implement effective ICT integration strategies in their classrooms.

2.12 LEARNERS' PERCEPTIONS ON TECHNOLOGY INTEGRATION IN EL2 PEDAGOGY

Learners constitute an important component of the pedagogic setting. They affect the initiation, design and delivery of instruction through their background, experience, attitudes, beliefs and skills.

These attributes may impact many technology-based projects, such as collaboration, completing tasks, autonomous learning, and different leadership roles. Within a

constructivist learning environment, all these tasks require active student involvement. Groff and Mouza (2008:33) note that these activities might be unfamiliar to those learners who are used to old pedagogic approaches - contrasted with constructivist learning - where the teacher directs the learning process.

Despite their digital native status, not all students will be so adept at using the various digital technologies within a pedagogic language-learning setting. Therefore, regarding technology proficiency, learners need to be familiar with the digital tools they are expected to use to complete tasks successfully. In this regard, Strydom, Wessels and Anley (2021:11) and Buckley-Marudas and Martin (2020:261) propose that teachers should provide proper guidance to learners in using the various digital technologies available, as well as appropriate training before the start of the given task, which will assist them in developing different forms of literacies required to become 21st-century independent learners.

In a project aimed at generating a new synergetic culture of learning 21st-century literacies, teacher digital literacy development experts, Gullen and Sheldon (2014:37), met with several groups of students to discuss changes that could be made to learning, projects and instruction. There were three questions students had to reply to.

Students' responses to the first question on how they learnt what was important to them, revealed general agreement that they found much of their learning content on different sites and platforms. When asked to describe engaging schoolwork that they completed, students shed light on how they would integrate technology to redesign a class, where they included descriptions of different apps, websites, video clips and reference to various media and new technologies. Students' feedback revealed high levels of interest, motivation and autonomy, as well as a positive attitude in how they approached the tasks. All these attributes are in harmony with a constructivist learning approach, which fosters student-centred learning and promotes research, collaboration and communication skills.

Results from Liu, Wang and Tai's (2016:118) inquiry on analysing learning patterns in English language students concerning Web 2.0 technologies, revealed an improvement in learners' vocabulary and reading. The researchers linked the improvement to the impact brought by using Web 2.0 tools in the learning activities, which enhanced learners' motivation and involvement. These findings affirmed results

from several other related studies (compare Mohammed, Assam & Saidi, 2020:178; Vandergriff, 2016:23; Bozkurt & Ataizi, 2015:160).

In Soussi's (2016:82) study on Moroccan teachers' and learners' perceptions on ICT integration in English foreign language lessons, most of the learners expressed their aspiration to incorporate new technologies in their English classroom. They admitted to learning various "new things" daily in a language away from school with the help of technology, and that in class, technology provided "a very enjoyable, entertaining environment for the exchange of ideas and sharing of interesting content". What the learners and teachers admitted to, brings to light the anywhere-anytime learning capabilities of technology.

Regarding learners' attitude, Dianti and Atmanegara's (2019:486) findings revealed that learners displayed a positive attitude towards ICT and that its use in English language learning motivated them.

Beukes, Kirstein, Kunz, and Nagel's (2018:525) research on SA students' perceptions and adoption of Technologically Enhanced Learning (TEL), revealed that most students favoured TEL and admitted that online learning was more valuable and had more benefits than the teacher-directed methods.

2.13 SUMMARY

English enjoys prominence in the SA public education language landscape. The immense potential for enhancing 21st pedagogy, if technology is integrated effectively into EL2 pedagogy, elevates its status even higher. To realise this, EL2 educators need to heed the call and make a shift towards adopting and implementing learner-centred, constructivist methods to language learning. Research reveals that ICT integration in EL2 instruction motivates learners and may enhance their involvement during the lessons. Meanwhile, learners, though necessarily not experts in integrating ICT tools, are believed to be digital natives who bring skill and positive attitudes towards technology integration in the ELT classroom. With support and guidance from teachers, these skills can be harnessed towards reaching desired curriculum goals.

Teachers are in part responsible for their own professional and career development. To this end, they may use the wide variety of digital tools that are accessible to themselves and their learners to teach English and gain digital literacy. Moreover, their anxiety and ineffectiveness in the use of ICTs can be circumvented with the provision

of appropriate professional development programmes that take into cognisance the contextual factors in which teachers work.

CHAPTER 3

ARTICLE 1: EXPLORING HOW 8TH and 9TH GRADE SENIOR PHASE TEACHERS INTEGRATE TECHNOLOGY IN EL2 PEDAGOGY

ABSTRACT

The researcher investigated the integration of ICT in EL2 in predominantly rural schools in the Free State Province of South Africa. English is the language of learning and teaching (LoLT) for most of the SA learner populace. To many others it is a second language if their first language is not English. In South Africa, the dilemma faced by learners entering the senior phase is many of them still have communicative and cognitive inadequacies in English. Despite the many benefits of technology, many English teachers in SA still employ transmission-based, teacher-centric pedagogy. In this study, the researcher explored *how* 8th and 9th grade teachers integrated ICT in EL2 pedagogy, by applying a qualitative approach. A phenomenological research design was used. Furthermore, the Technology Pedagogy and Content Knowledge (TPACK) framework was employed to conceptualize ICT integration. Data were collected through semi-structured interviews, focus group discussions and classroom lesson observations. Findings revealed the following: (1) a need for appropriate teacher training and development in ICT integration, (2) inadequate provision of technology resources at the schools, and (3) absence of clear ICT integration guidelines for EL2 teaching. The article concludes with a call for remedial action on: (1) apposite teacher professional development in digital pedagogy in EL2, (2) provision of ICT resources and support for EL2 teachers, and (3) development of clear ICT integration guidelines for schools.

Keywords: constructivist; EL2; senior phase; ICT integration; professional development; TPACK; Fourth Industrial Revolution

3.1 INTRODUCTION

The South African Curriculum and Assessment Policy (CAPS) for English, recognizes language as an instrument for thinking and communicating (DBE, 2012:8). English is still dominant in the SA school system (Chetty, 2019:246). This dominance means many learners use their L2, mostly English, as the LoLT. They are expected to be sufficiently competent in reading and writing appropriately in English (DBE, 2012:8). Initially, in the foundation and intermediate phases, which cater for 1st to 3rd grade,

and 4th to 6th grade learners respectively, focus is on building learners' Basic Interpersonal Communication Skills (BICS). This evolves to the use of L2 for purposes of thinking and reasoning, and developing learners' Cognitive Academic Language Proficiency (CALP). The problem is, by the time learners enter the senior phase, communicating efficiently in L2 is still a challenge to many. Indeed, many still display communicative, as well as cognitive deficiencies in their second language, English. Large Scale Assessments (LSAs) conducted in South Africa – the erstwhile ANA⁵, PIRLS⁶ and TIMSS⁷, as well as SACMEQ IV⁸ reveal grave academic deficiencies among SA learners, and the use of English as the LoLT is reported to be a causal factor. SA is a multilingual country, with English as one of the eleven official languages. Although it is not a first or home language for most of the learners and their teachers, English is used as the medium of instruction in most government schools. It is for this fact that the learners' reading and writing competence in English is expected to be adequate.

The infusion of learning technologies is a recent development aimed at improving education in SA (Ojo & Adu, 2018:1). Using ICT in additional language classrooms has the potential to improve learners' academic performance (Chang & Hung, 2019:12). Recent literature, however, suggests that in South Africa, only a few teachers use ICT in an effective manner in the classroom (Padayachee, 2017:68). This study is set against this background to investigate how 8th and 9th grade teachers integrate ICT in EL2 pedagogy.

3.2 RESEARCH CONTEXT AND PROBLEM STATEMENT

The Teacher Professional Development Framework for Digital Learning (DBE, 2017) aimed to develop educators with the ability to use ICT to improve instruction.

This objective is reiterated in the Teacher Professional Development Master Plan 2017-2022 (DBE, 2019) on digital learning. According to the plan, there would have been significant improvement on the capacity of teachers to implement digital learning by 2022 (DBE, 2019:19). Contrarily, Vandeyar (2021:44) advances that the above ideals have hitherto not been achieved, and attributes this to implementation neglect,

⁵ Annual National Assessment was last ministered in 2015

⁶ Progress in International Reading Literacy Study (PIRLS) is an international large-scale assessment that monitors reading comprehension and trends of growth in reading literacy

⁷ TIMSS Trends in International Mathematics and Science Study

⁸ The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ)

as this and other policies -- The White Paper on e-Education (2004), and Guidelines for Teacher Training and Professional Development in ICT (2007) -- to introduce technology in teaching, seemed merely symbolic as they did not talk to the curriculum.

English and its dominance on the SA basic education landscape means it is the preferred language of choice to many learners and their parents. At the functional level, EL2 is not the learners' mother tongue, but functions as both a medium of communication and LoLT (DBE, 2014:69). In 8th and 9th grades, "the majority of children are learning through the medium of their L2, English" (DBE, 2012:9). Thus, EL2 is the learners' LoLT. However, in SA, neither the learners, nor most of the teachers who teach them, are English first language speakers.

DBE (2012:8) acknowledges that learners in the 8th and 9th grades of the senior phase should have a good command of English. This high level of proficiency is recognised by many researchers as key to the mastery of concepts that learners require for further academic success (Prinsloo et al., 2018:2). In South Africa the predicament is that many learners that enter the senior phase still present communicative and cognitive academic deficiencies in their additional language, English.

Recent Large-Scale Assessments (LSAs) conducted in SA - TIMSS, in a report by PIRLS 2021 (IEA, 2021) and Reddy, Visser, Winnaar, Arends, Juan, Prinsloo and Isdale (2016) - point to poor academic and reading performance among SA learners. Of the 57 participating nations in the PIRLS 2021 assessment on learners' reading assessment, SA ranked bottom on the reading achievement scale. The country attained 212 scale score points below the scale centre point of 500. Despite some improvement resulting from additional resources in education, many SA learners continue to achieve poorly. Three aspects that influence achievement are language (Prinsloo et al., 2018:7; Reddy et al., 2016:12), resources at home and school (Visser et al. 2015:5), and teaching practices (Arends, Winnaar & Mosimege, 2017:335).

SA learners' underachievement seems to have persisted from earlier assessments to the modern era. An analysis of 2014 Grade 9 ANA results revealed an average of 34% performance ranking of the sampled learners in EL2. Reading and viewing obtained 43%, which was the highest, followed by writing and presenting at 37%. Language structures and conventions scored a low 22%, exposing the difficulties learners endured in responding to language questions (DBE, 2014:36).

This inadequacy has outlived several curricula reforms introduced to SA's basic education system: Outcomes Based Education (OBE), National Curriculum Statements, Revised National Curriculum Statement (RNCS), to the current CAPS. Therefore, it is against this background that integrating educational ICTs in EL2 pedagogy needs to be favourably considered as one of the ways to introduce some change in the current pedagogic approaches which are likely to be linked to many learners' language challenges.

Introducing instructional technology changes the roles of both the teacher and learners -- the former is no longer the possessor of knowledge, with the latter passively being fed facts (Chisango, et al., 2020:2). According to Demirkol-Orak and İnözü (2021:992), the teacher is a facilitator in the learning environment, while Tomljenović and Vorkapić (2020:15) describe the role as that of mediator, who facilitates pedagogic activities. One of the developments the contemporary teacher faces is new technologies supporting actual classroom teaching (Dreyer et al., 2015:25). Consequently, as policy requirements change for the introduction of new technologies, secondary school English language teachers are expected to adapt their pedagogic approaches accordingly (Rwodzi, De Jager & Mpofu, 2020:1).

In line with the changing roles of teachers and learners, many teachers still need to adopt 21st-century modes of teaching to be able to develop learners with the requisite skills (Shafie et al., 2019:29), as required in our response to the fourth industrial revolution demands. Therefore, these novel technologies are useful for teachers to manage in delivering instruction more effectively. Dreyer et al. (2015:76) concur that technology invites learners to be autonomous, confident and inventive during learning. In this way, educational technology affords teachers a change from dominating the classroom to placing the student at the centre (Crossley & Mcnamara, 2017:19).

In recognizing the benefits of the innovative use of educational technology, countries such as Chile, Malaysia, Thailand, and Singapore have made substantial investments in launching and advancing ICT-in-school programmes. Of these, Australia and Finland are regarded as the leaders in ICT integration programmes in education (Kian, 2019:383). In SA, the DBE is introducing digital technologies to enhance instruction and attain equity in schools (Graham et al., 2020:749). In pursuit of this goal, the DBE has formed partnerships with several bodies, like the Vodacom Foundation, Microsoft, UNICEF, the British Council and MICT SETA. With the Vodacom Foundation, the DBE

started the eLibraries Project, aimed at establishing digital libraries at 61 teacher ICT centres countrywide. The British Council's Learn English Audio Project (LEAP) supports schools' access to high-quality online English learning resources to improve listening and speaking skills. In partnership with Microsoft, UNICEF, Vodacom, and MICT SETA, the DBE initiated the Microsoft-facilitated Microsoft Imagine Academies (MIAs) around the country to improve integrating technology in schools (DBE, 2017).

Dlamini et al. (2018:152) add that although mobile technology is pervasive in SA, it has not translated into a widespread uptake of ICT in schools. Recent literature also suggests that few SA teachers are using digital technologies in their instruction (Dlamini et al., 2018:152; Padayachee, 2017:168). Effective use of instructional technology means harnessing technology affordances to transform classroom practice. Shulman (1987) identified technology, pedagogy, and content knowledge (TPACK) as the knowledge sets on which professional teaching rests. Including knowledge of learners in their classes, teachers are required to draw on the repertoire of the TPACK knowledge spheres of instruction to inform their classroom practices. It requires of teachers the ability to structure relevant and interesting lessons with technological, pedagogical and content knowledge (further details under the TPACK section).

While the literature indicates that there are many benefits associated the pedagogic integration of technology, it is not known in some SA schools why some teachers disregard its use. This study was motivated by the quest to discover and understand why many English language teachers still fail to adapt their pedagogic approaches accordingly as noted by Rwodzi, De Jager and Mpofu (2020:1) in line with the changing roles of teachers (and learners), and adopt 21st-century instructional approaches to equip learners with the requisite skills (Shafie et al., 2019:29), as required in our response to the expectations of the fourth industrial revolution.

The researcher acknowledges that adopting ICT does not naturally translate to better teaching practices and automatic improvement in learner attainment. My argument is about what technology can potentially do to enhance the learning environment if approached with the intention to do so. I advance, therefore, that the expectation implied by this approach is that those teachers who may not have embraced the need to adapt to their changing roles, with proper support and training, will change accordingly.

While different studies have illuminated the pedagogic benefits of integrating ICT, understanding the factors that prevent teachers from incorporating ICT in their instruction is still limited, even when they are aware of its potential. Previous research has identified barriers such as lack of training and inadequate infrastructure (Sabiri, 2020:182; Alhumaid, 2019:16; Louw, Rankhumise & Maimane, 2019:305), and resistance to change (Hart, 2023:10; Sabiri, 2020:182; Lawrence & Tar, 2018:83), but little has been done to explore teachers' perceptions, attitudes, and external support systems and how they impact teachers' actual integration of ICT (or lack thereof) in their instruction.

The significance of addressing this problem is crucial. Pedagogic integration of ICT holds the potential to bridge the apparent pedagogic gaps manifest in EL2 instruction, especially in enhancing 21st-century competencies like communication, collaboration, and critical thinking. By identifying and understanding the challenges teachers face in integrating ICT, there is cause to believe that education policymakers, institutions, and professional development programs can better support teachers in overcoming these barriers, and ultimately improving the quality of teaching and learning.

Findings from this study revealed that no ICT resources were used to support learning as educational technology in the EL2 learning environment. It was discovered that there was: (1) a need for appropriate teacher training and development in ICT integration in 8th and 9th grade EL2 pedagogy, (2) inadequate provision of educational technology resources at the schools, and (3) absence of clear ICT integration guidelines for teaching EL2 in the senior phase.

The research question that guided this investigation was:

How do 8th and 9th grade senior phase teachers integrate ICT in EL2 pedagogy in Maokeng schools?

This was supported by the following sub-questions:

1. What are teachers' views on integrating ICT in senior phase EL2 pedagogy in Maokeng schools?
2. What are the barriers preventing senior phase EL2 teachers from integrating ICT into their instruction, despite their awareness of its benefits?

The research focus was on 8th and 9th grade EL2 teachers in Fezile Dabi Education District's secondary schools located in the Maokeng residential area. The senior phase is the tributary phase to the FET and the specific focus of this investigation.

In the next section, an in-depth exposition of TPACK is given, juxtaposed with a discussion on constructivism, both as the theoretical foundation for the research.

3.3 THEORETICAL / CONCEPTUAL FRAMEWORK

TPACK and constructivism were simultaneously contemplated to provide the theoretical foundations for this investigation. The former was employed to offer a conceptualization of the integration of technology. On the other hand, principles of the latter were considered within an effective language learning environment.

3.3.1 TPACK

The TPACK framework has appeared to be the theoretical model most appropriate for rationalizing educational integration of technology by teachers (Mishra, 2019:76; Willermark, 2018:316). To integrate technology, an educator is required to possess curriculum content acumen, the aptitude to choose the right digital tools and create engaging pedagogic activities (Foulger et al., 2021:1). Therefore, as fields of professional expertise of teachers, these knowledge components work together rather than separately (Shulman, 1987:8; 1986:9).

No known sphere of human life has not been impacted by technology, and education cannot be spared. There are many a study arguing favourably for the benefits of technology in education (compare Nanjundaswamy et al., 2021; Chubko et al., 2020; Munyaradzi, Samantha & Maphalala, 2020; Dlamini et al., 2018; Çakici, 2016; Liu & Kleinsasser, 2015). Irrespective, digitalizing L2 pedagogy should not be perceived as the universal solution to all EL2 language learning and teaching challenges. Technology is merely a tool used to improve the performance of teachers and enhance the attainment of 21st-century competencies by learners. Achieving this rests in how well educators practically combine their knowledge of technology, pedagogy and content (Foulger et al., 2021:1; Saudelli & Ciampa, 2016:230).

Many of the long-established, teacher-centred teaching methods are now considered ineffective. The contemporary EL2 educator is obliged to integrate digital tools to remain relevant. The TPACK framework is relevant and applicable, because it considers technological knowledge as an integral part of instruction. Congruent with

this view, the poor academic performance by EL2 learners described above, could be a result of the absence of one or a combination of the knowledge types required by teachers to teach with technology.

Figure 3.1 is the updated edition of the TPACK image. Contexts, representing contextual knowledge, highlights the organizational and situational constraints, such as technologies and policies that teachers work with (Mishra, 2019:2) (as discussed below). In SA, these contextual realities are inter alia, poorly ICT-resourced public schools, inadequate teacher-training and development in teaching with technology and lack of ICT policy implementation. The TPAC knowledge trilogy could be the solution EL2 teachers need to deliver lessons and subject content in ways that address EL2 learners' poor performance. Mishra (2019:2) makes a valid point in advising that context should be well understood if teachers are to manage their organizational challenges effectively.

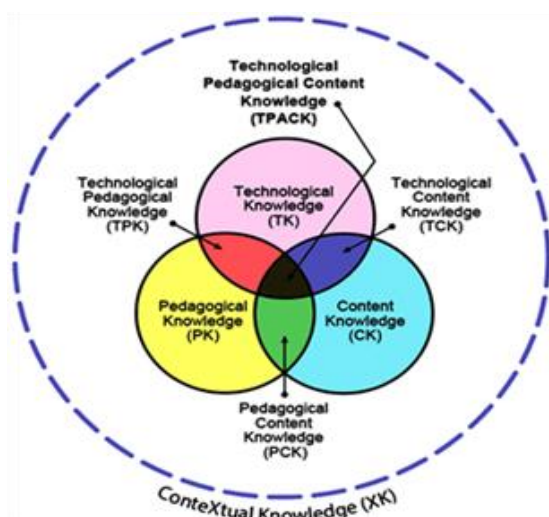


Figure 3. 1: Revised version of the TPACK image (Mishra, 2019:2)

3.3.2 Constructivism

Constructivism exists in a variety of forms in various disciplines, and education is no exception (Jitka, Jitka & Pavlína, 2018:133). Many of the core ideas of constructivism are based on the influence of Jean Piaget. In Piaget's model of cognitive development, a child actively constructs knowledge (Abderrahim & Gutiérrez-Colón Plana, 2021:39; Badie, 2016:295). Piaget's cognitive constructivism theory (1976), emphasised active discovery, intrinsic motivation, practical learning situations, and creative and critical-thinking (Dreyer et al., 2015:43). Hirtle (1996:91) concurs that constructivism has the

provision of a learning environment in which learners can apply critical-thinking and question existing knowledge as one of its main goals.

As far as constructivist learning and integrating learning technologies in English language instruction is concerned, the foregoing resonates well with Kaya's (2015:5) assertion that:

"Blogging, media technology, useful websites and certain computer programmes into English language teaching help create optimum conditions from the constructivist perspective."

Hereto, Ghasemi and Hashemi (2011:3099) suggest the following technology affordances for L2 language learners:

- accessing, selecting and interpreting information,
- communicating and presenting information,
- collaboration.

The basic premise of constructivism is learner-activity in the interpretation and evaluation of experiences to make meaning of, or to construct knowledge (Dlamini et al., 2018:179), while teachers serve as facilitators (Dreyer et al., 2015:18). This view is in consonance with Abderrahim and Gutiérrez-Colón Plana's (2021:39) and Badie's (2016:295) assertion above, which affirm Piaget's postulation on constructivism. In contrast, the English lesson in a typical South African L2 classroom is still teacher-dominated. For the most part, learners are passive recipients of the information that the teacher imparts. Given my pedagogic background both in EL2 instruction and management roles, I agree that the nature of this teacher-centred instructional approach deprives many EL2 classrooms in SA of the constructivist environment advocated by Piaget and maintained by various other scholars already cited (cf. Abderrahim & Gutiérrez-Colón Plana, 2021; Nanjundaswamy et al., 2021; Chubko et al., 2020; Munyaradzi et al., 2020; Dlamini et al., 2018).

Chubko et al. (2020:3600) have highlighted the intersection between constructivist instruction and use of technology through digital story telling, which they argue promotes collaborative writing and learner autonomy, as well as improvement in learners' presentation and writing abilities (Niemi et al., 2018:332).

Gul's (2016) review showed how constructivist-based English pedagogy was better than the traditional approach. According to Gul, an investigation in Saudi Arabia

revealed that employing a learner-centred approach increased students' reading comprehension more than the traditional method. Gul also mentioned that visible evidence was found of increased foreign language learning when students constructively used visuals and prepared a video project using teamwork (Gul, 2016:29).

Kolobe and Mihai (2021:303) explored how technology in EL2 pedagogy influenced comprehension in two schools from the Gauteng Province of SA. They discovered that using technology to support progressed learners, yielded positive results. With lessons incorporating the use of integrated white board, YouTube videos and other e-reading content, learner-directed activities allowed discovery learning and learner autonomy by allowing learners to find solutions to comprehension questions on the spot through using Google. Furthermore, the findings demonstrated that ICT had the capacity to reduce the number of learners who had to be progressed for failing to satisfy promotional requirements.

The current study sought to investigate how Maokeng 8th and 9th grade teachers incorporate digital tools in EL2 instruction. Premised on the presumption that content and pedagogy are pre-existing in teachers' knowledge repertoire, the teacher lesson observations I conducted focused on ICT integration. The lessons I observed were devoid of technology integration practices. No evidence of the constructivist-based instruction alluded to by Chubko et al. (2020), Niemi et al. (2018), Gul (2016) and earlier by Kaya (2015), could be adduced. This scenario could very well explain, albeit in part, one of the causes of the shortcomings in many SA learners' academic achievement in EL2.

3.4 METHODOLOGY

This study applied a qualitative approach to investigate Maokeng 8th and 9th grade teachers' perceptions on integrating ICT in EL2 pedagogy, and barriers impacting thereon.

The choice of a qualitative research was informed by the research problem and the research question (Korstjens & Moser, 2017:274), which sought to understand how 8th and 9th grade teachers perceived the integration of ICT in EL2 pedagogy. Understanding what participants (in this case teachers) think, feel or do in their natural context (the school), Korstjens and Moser (2017:275) advance, can enhance their

practice and evidence-based interventions. Tenets of qualitative research dictate that a qualitative approach is the ideal approach to explore and understand how individuals or groups assign certain meaning to social or human phenomena (Cresswell & Cresswell, 2018:51). For example, despite their awareness of the advantages of integrating ICT, teachers are reluctant or hesitant to do it. By employing qualitative research, the researcher might determine why they act this way.

Regarding the research questions and findings from previous and related studies, it is possible that findings from this study might reveal that the teachers are, or are not integrating ICT in their instruction. In the latter case, they might cite similar barriers like lack of appropriate training and support from the Department of Education, poor resources, and infrastructural inadequacies at schools.

RESEARCH DESIGN

Following a phenomenological design, the researcher examined the nature of challenges faced by 8th and 9th grade teachers, including their attitudes in using technology to enhance EL2 instruction. The choice of phenomenology was influenced by the nature of the research problem, the research question and the scientific knowledge the researcher seeks (Korstjens & Moser, 2017:277). The focus was on the essence of the teachers' experiences about factors that impacted their pedagogic integration of ICT, to try to understand the basic structure of that experience and interpret the meaning it has for them. The design is intended to uncover what the teachers' reasons might be for not integrating ICT in their teaching from the data gathered through the various data sources.

DATA COLLECTION

Guided by tenets of cognitive constructivism, data collection entailed a semi-structured interview with each teacher, followed by a lesson observation on dates and times mutually agreed upon between the teachers and the researcher. The interview schedule comprised both open- and closed-ended items. The latter sought to establish the years of teaching experience, age, qualifications, types of digital tools available and used, and grades taught by the teachers. The former freely elicited responses on the teachers' perceptions, skills and practices on ICT integration.

Interviews

Except for teachers D-4 and E-5, who were interviewed during their off-periods because of their other work commitments at their schools, I visited the teachers after formal tuition hours at their respective schools to conduct individual interviews, which lasted between an hour and 90 minutes. All COVID-19 Standard Operating Procedures (SOPs) were followed. The five interviews were all video-recorded. This would assist with the transcription of the data for a more accurate reflection of the discussions.

Below is the table depicting the teachers' interview schedule.

Table 3. 1: Teachers' interview schedule 1

Interview schedule			
Teacher	Date	Time	Duration
1-A	20/04/22	15:30	63mins.
2-B	22/04/22	14:30	70mins.
3-C	25/04/22	15:00	68 mins.
4-D	29/04/22	09:10	71 mins.
5-E	03/05/22	11:20	69 mins.

Lesson observations

The phenomenon observed during classroom lesson observations was whether the teachers infused technology during instruction. The researcher took notes of whether any ICT tools were available, the type, location and how they were used. Moreover, lesson observations were intended to corroborate data gathered during interviews, as well as to verify the theoretical foundations on which the study was conceptualized, i.e. technology-based, constructivist instruction.

The following is the teachers' lesson observation schedule.

Table 3. 2: Teachers' lesson observation

LESSON OBSERVATION					
Teacher	Date	Topic	Grade	Time	Duration
1-A	26/04/22	A poem (The Will)	9	9:30	40 mins.
2-B	06/05/22	An advertisement	9	09:20	40 mins.
3-C	09/05/22	Concord	8	11:10	40 mins.
4-D	11/05/22	Analysing a cartoon	8	08:00	40 mins.
5-E	13/05/22	Writing a summary; analysing a cartoon	8	12:10	40 mins.

ANALYSIS AND INTEPRETATION OF THE DATA

The data were transcribed verbatim from video-recordings of each participant. The researcher read through the data from the first participant, writing reflective notes and annotations to the last participant. Moser and Korstjens (2017:8) advise that by reading and re-reading the data, possible theme and categories might emerge.

Based on this, thematic analysis was used in this study for identifying recurring themes and categorizing the datasets in relation to the research objectives. Data generated were thematically coded, transforming it into categories (sub-temes) and themes. Subsequently, conclusions were drawn, based on observations from the transformed data.

The data, which were collected using semi-structured interviews and classroom lesson observations, were intended to respond to the following research questions:

The main research question was:

How do 8th and 9th grade teachers integrate ICT in EL2 pedagogy in Maokeng schools?

This was supported by the following sub-questions:

1. What are teachers' views on integrating ICT in 8th and 9th grade EL2 pedagogy in Maokeng schools?
2. What are the barriers preventing 8th and 9th grade EL2 teachers from integrating ICT into their instruction, despite their awareness of its benefits?

PARTICIPANTS

Participating teachers were selected through purposive sampling. The teachers were believed to have the knowledge and motivation to provide relevant information, and to communicate freely on the phenomenon under investigation, as elucidated by Vasileiou, Barnet, Thorpe and Young (2018:2) and Moser and Korstjens (2017:2).

The participants were selected according to the following quota sampling characteristics, according to Vasileiou et al. (2018:2) and Moser and Korstjens (2017:2):

- Senior phase EL2 teachers in 8th and/or 9th grade, each from the five sampled secondary schools in the residential area of Maokeng, Fezile Dabi Education District.
- Five years or more EL2 teaching experience. This criterion was influenced by Cindrić and Gregurić's (2019:158) submission that integrating digital technologies into English Language Teaching (ELT) to improve L2 pedagogy, presumes that educators have developed the requisite ICT skills. Moreover, the integration of ICT in ELT is no longer considered ancillary, but at the core of the field. It is expected that (language) teachers possess and display the three aspects of knowledge in teaching, namely knowledge of technology, pedagogy, and content. Regarding knowledge of technology, the EL2 teacher should be familiar with the methods and approaches in use of ICT in teaching, as well as the ability to effectively use it (Cindrić & Gregurić, 2019:162).

The teachers were assigned the alpha-numerical codes in table 3.3. The letter indicates the sequence in which the teachers were interviewed, while the number represents the school where the teacher is employed.

Table 3. 3: Teacher information

Teachers (Codes)	Age	Qualifications	Gender	Grade/s currently teaching	Population group	Years of teaching experience in EL2	Level of training in ICT integration
A-1	28	BEd	F	9 – 12	African	5	No training
B-2	29	BEd	M	8,9	African	6	Online certificate
C-3	26	BEd	M	8,9,11	African	5	No training
D-4	30	BEd Hons	F	8,9	African	7	Online certificate
E-5	48	SPTD; Certificate in Computer Literacy	F	8	African	16	Certificate

Teachers in these categories satisfy the research criteria in that:

The researcher works and resides in the Fezile Dabi District, where the schools are also located. Through purposive sampling, Fezile Dabi was selected according to convenience and proximity. The researcher is a qualified EL2 teacher with more than five years' teaching experience in 8th and 9th grades.

LIMITATIONS

The following limitations were present in the study:

1. The study group was limited only to 8th and 9th grade EL2 teachers within the Maokeng area. The researcher has also taught in these grades. These grades are part of the senior phase where there is paucity of research in this field.
2. The schools were in quintiles⁹ 2 or 3. Both quintiles represented poor public schools, with 2 being poorer than 3. Due to their socio-economic status, these schools would benefit more from any forms of intervention than would schools in quintiles 4 and 5.
3. Constraints of time limited the time for data collection. Access to the participants depended on their availability only at the given times. More lesson observations and interviews would have contributed to the richness of the data generated.

⁹ Quintile A 1 to 5 ranking of schools from poor to wealthy based on the unemployment and literacy rates of the community in which the school is based.

4. The teacher population sample was limited only to 5. This limited the scope of the data collected as a bigger sample would have increased the scope.
5. The data gathered were triangulated through semi-structured interviews, lesson observations and field notes to enhance the quality.

ETHICAL CONSIDERATIONS

This study received ethical clearance from the Research Ethics Committee of the University of the Free State.

The key principles of respect, justice and beneficence were adhered to in the study design, sampling procedures, and within the theoretical framework, research problem and questions.

The voluntary nature of the study meant that the teachers gave written consent to participate in the study. Consent from participants was gained on grounds of participant anonymity, including concealing their identity and that of their schools, using numbers and letters. Permission to conduct the research at the schools was granted by the Free State department of education and the principals of the individual schools which served as sites for the investigation.

Data from the study will be kept confidential. Hard copies will be kept under lock by the researcher for a period of five years. Electronic information will be stored on a password-protected computer. The researcher will incinerate all the redundant hard copies, and the soft copies will be deleted.

Equally, the following safeguards were employed to protect the participants' rights (Cresswell & Cresswell, 2018:329):

1. Research objectives were communicated in verbally and in writing so that they were clearly understood by the participants.
2. The participants were informed of all data collection procedures.
3. Verbatim transcriptions were made available to the participants upon request.
4. Participant anonymity was considered when capturing and reporting the data.

The section that follows describes and defends the procedures the researcher used to determine the trustworthiness of the results.

TRUSTWORTHINESS

The importance of trustworthiness lies in the actions the researcher took to make the results authentic, namely credibility, transferability, and dependability.

CREDIBILITY

The researcher used triangulation to maintain the consistency of the findings and minimise bias. Triangulation was performed through semi-structured interviews and lesson observations.

TRANSFERABILITY

To establish transferability, the researcher worked with a manageable, purposefully selected samples of teachers to investigate the phenomenon of ICT integration within the specific context of the school. In this way, the themes that were identified could be applied in contexts that share the same characteristics.

DEPENDABILITY

The researcher made the research process transparent and systematic by describing the steps taken to collect, analyse, and interpret the data. These steps minimised inconsistencies and errors so that the study would return same results if repeated under the same conditions.

The preceding section outlined the methodology the study followed in generating the data that would address the research question or problem. Following a phenomenological design, the researcher examined the nature of challenges faced by 8th and 9th grade senior phase teachers, including their attitudes in using technology to enhance EL2 instruction.

In the next section, the results from the analysis of the teacher interviews will be presented, followed by those from classroom lesson observations and the analysis of the data.

3.5 RESULTS/ FINDINGS

This article explored the integration of ICT by seeking to respond to the following research questions. The main research question was:

How do 8th and 9th grade senior phase teachers integrate ICT in EL2 pedagogy in Maokeng schools?

It was supported by the following subordinate questions:

1. What are teachers' views on integrating ICT in 8th and 9th grade EL2 pedagogy in Maokeng schools?
2. What are the barriers preventing 8th and 9th grade EL2 teachers from integrating ICT in their instruction, despite their awareness of its benefits?

The previous section focused on teachers' interviews, and their responses to the interview questions in Appendix 1. In the following section the results from the analyses of the teacher interviews are presented, followed by those from classroom lesson observations. The data analysed from the teachers' interviews revealed a common conceptualisation of the phenomenon pedagogic ICT integration. This included some examples of pedagogic tools, and the involvement of learners. The data also included the factors that constituted barriers which prevented the integration of ICT by the teachers. While they were aware of the affordances of ICT, they also intimated the possible disadvantages associated with using ICT in teaching and learning.

Table 3.4 shows the five main themes that emerged from the analysis of the interviews. They were: tool to aid instruction, language learning skills, support for ICT integration, knowledge and skills, and ICT resource constraints.

Interviews

Table 3.4 shows the themes and sub-themes that emerged from the analysis of the interviews.

Table 3. 4: Summary of themes-- teacher interviews

Research questions (RQ)	Themes	Sub-themes
RQ 1: What are 8th and 9th grade teachers' views on integrating ICT in EL2 pedagogy in Maokeng schools?	Tool to aid instruction	Curriculum content; videos.
	Language learning skills	Access to information; different abilities; research skills.
	Support for ICT integration	Beneficial; add value; essential; good idea
	Knowledge and skills development	Personal development
RQ 2: What are the barriers preventing 8th and 9th grade teachers from integrating ICT in their instruction, despite their awareness of its benefits?	ICT resource constraints	Training; resources; support

The following are the themes that emerged from the thematic coding of the teacher interviews data:

Theme 1: Tool to aid instruction

All teachers' responses (to questions attached hereto as Appendix 1), revealed almost similar conceptualisations of the pedagogic integration of ICT. One teacher, **B-2**, said, *"...to use technology to deliver content to the learners and they in turn can use technology to study the work that is being done at school."* Another, **C-3**, *"...use (of) technological tools, maybe tablets, or cell phones, or even tablets inside the classroom...to supplement the information from the textbooks and other learning materials..."*. *"...using technology in your lessons as a language teacher, technology materials such as a computer, data projector,"* expressed **D-4**.

Other teachers added the significance of social media platforms, e.g. WhatsApp, as a tool for bilateral interaction between their learners and them as teachers, as well as an aide for video presentation of certain topics. In the words of **C-3**, *"I am always trying to find shorter videos to send via WhatsApp to watch and repeat if they don't*

understand.” **B-2** almost reiterating, *“I download video clips, play for them in class.”* YouTube was also considered a useful platform to integrate technology to assist learners who *“learn by watching and listening to a particular play or movie,”* according to **1-A**.

Theme 2: Language learning skills

The teachers reflected nearly the same views on some of the affordances of ICT integration for ELT. From their responses, three key affordances of technology integration emerged, viz. curriculum differentiation to accommodate different learning styles, learners’ access to information, and sharpening their research skills. Regarding the first affordance, **E-5** stated, *“My learners bring certain skills to the English class, such as listening and observation, and the hearing skill as well, but through teaching and learning with ICT... it improves their skills.”* As articulated by **D-4**, *“some learners learn better by seeing things, others by hearing them. So when you come with ICT in class you accommodate a certain group of learners in your class.”* In relation to the third affordance, one educator mentioned *“...would be giving the learners the necessary skills to go to the Internet and look for information for themselves”,* said **C-3**, while **D-4**’s view was, *“you get to familiarise your learners with the use of technology beyond the subject, that there are sites they can access to get information on the Internet.”*

It also emerged that there were both the good and the bad side to the using digital tools in the EL2 classroom. **B-2** aptly stated: *“The Internet plays both roles. It is easy to find a lot of information, some of which might mislead learners or teachers themselves, because you find that on platforms such as Google, anyone can post anything, factual or non- factual.”* The response from **C-3**, relating to the use of cell phones, noted that a teacher could permit learners to bring their cell phones to class to show them *“how to use them effectively, but then the phones would be disruptive in class.”* Another concern was raised by **D-4** about the use of cell phones in class: *“Cell phones can be very bad for teaching and learning or for learners, because they might end up moving from the lesson to their chatrooms, looking at their WhatsApp, Facebook, and X, and busy with that...and to record things in class, which are meant to be private business in the school.”*

Furthermore, **D-4** also conceded that *“there are no good or bad devices, it is the use that determines whether they are good or bad,”* adding that, *“when we use cell phones*

instead of writing on the board, we can save a lot of time. It accommodates those learners who can't see on the board, but can easily see stuff on their cell phones."

In fact, one view common among teachers was the element of control and management of the use of devices by learners during the lesson. Teachers believed that some control measures against cell phone misuse in class were better than no cell phones at all. The researcher could deduce from this sentiment that teachers supported the idea of technology being in the hands of learners. As noted by **D-4**, *"helping learners to control their use of cell phones or laptops helps them with their self-control and their social skills."* The view from **C-3** was: *"I think it would be the issue of [school] management managing the tools."* **B-2** indicated: *"You can always filter internet access for learners."* These views resonated well with the ideal of a learner-centred approach.

It should be noted that the schools to which the teachers were attached, all practised a "no cell phone at school" policy for learners.

Theme 3: Support for ICT integration

Teachers spoke overwhelmingly in support of integrating technology in EL2 instruction and their own lessons. In the words of **1-A**: *"It (technology) would be beneficial to EL2 as a mediator (i.e., as a tool to facilitate teaching). It will add value to the content that I want to share with the class by presenting it in a more realistic manner."* **B-2**: *"It is very essential to language teaching in general and to my own teaching."* As **C-3** indicated: *"I came to realize that the use of ICTs can make our job easier and also make learning simpler for learners. It will be a very good idea for it to be implemented."* **D-4** explained: *"It is important to have integration so that they see English as part of the broader world."* **E-5** summed up: *"I think it's good for us as teachers to equip ourselves, and keep on learning about new developments. It's a good thing."*

Theme 4: Knowledge and skills development

Some teachers admitted they were engaged in professional and/or personal development. It appeared that while they considered development an important aspect of both professional and personal growth, it took various forms. *"When it comes to ICT integration, development is informal. I go to the Internet to see what's new in the field, what else I can take from other teachers who are sharing their experiences on the Internet,"* stated **C-3**. Lack of professional development and training in pedagogical

integration of ICT appeared to be the case with **C-3** and **D-4** in this study. This was congruent with Dlamini and Dewa's (2021:30) findings, that there were great training and development needs in ICT integration to compensate for the low skills level among teachers, especially in quintiles 1 to 3 schools.

Another response indicated professional development, though not related to ICT integration in EL2 pedagogy. *"I get to attend a lot of workshops whereby I'm now enriching my knowledge in EL2"*, observed **1-A**. ICT-related professional development was also cited, *"I recently completed my certificate in English online teaching"*.

The responses from teachers **1-A** and **C-3** above draw attention a set of two incompatible scenarios. Teacher A talks about informal development, and Teacher C has completed an online course. This dichotomy points to the possibility of lack of a structured development programme for teachers in ICT integration. Or even if there was such a programme, some teachers were not aware that it existed.

Teachers viewed training as a central part of professional development. Most of them conceded that they would like to be assisted to transform their own practice to integrate ICTs. In the words of **C-3**, *"I would like to be assisted with the actual implementation [integration] of ICT. Say, if you are teaching a poem or listening comprehension, this is how you go about it when you have the technological tools."*

Regarding development, one teacher acceded, *"Through more workshops from more experienced practitioners,"* a view shared by **E-5**, stating, *"I would like to have development in PowerPoint for presentations in class."* The foregoing points to the issue of self-development by teachers, especially in the absence of a coordinated, in-service ICT-integration professional development programme within the DBE.

Other teachers thought the issue of resources was more pertinent. **D-4**'s view was, *"If the materials to be used can be made available to me,"* she stated, *"laptops, tablets for learners - that would be very nice."* **1-A** iterated, *"May our classes be technology-friendly – data projectors, computers, or something to connect."*

Theme 5: ICT resource constraints

In this theme, perception met reality, because whether teachers were integrating technology or not, came to the fore. The teachers' responses to what they considered as factors that impacted their integration of ICT in their instruction, revealed that there was no integration. Among the reasons, was lack of support from the DBE, and poor

infrastructure at their schools. **C-3**'s response was, *"...when it comes to the department, it would greatly influence my teaching because if I know that I have the necessary tools available and I know where to find them, I would be confident in trying to teach using ICT in the classroom..."*. **B-2** responded, *"Lack of support from the department, lack of training..."*. *"...funds. We need more computers to accommodate learners, and another sponsor for data"*, iterated **1-A**. This point was reiterated by **D-4**, in *"not having data, lack of resources and poor infrastructure"*. The challenge of infrastructure was equally a problem at school 5, where the teacher, **E-5**, stated, *"...there are those projectors where the cables are broken, cut and cannot work"*.

The barriers the teachers stated above constitute the external factors described by Sabiri, (2020:182), Alhumaid, (2019:16), Louw, Rankhumise and Maimane, (2019:305), and defined as the contextual factors (Mishra, 2019:2) teachers need to manage to circumvent ICT integration challenges.

What also emerged from the teachers' responses was how much the teacher-centred approach described earlier was still the order. To the question whether there was any specific methodology they used to conduct their lessons, **B-2** replied, *"...we depend a lot on textbooks. Often you find yourself limited on the use of ICT integration in class, so we rely mostly on books and textbooks. And... we speak a lot."* The response from **E-5** was, *"No. I just use LTSM books..."*.

To how they thought their learners found their lessons now, compared to lessons where ICT would be integrated, **C-3**, answered, *"Yes they would have a different opinion. ...(now) they are just there listening to what I'm saying. Sometimes I would not be sure if the person is understanding me or is just there just listening"*. **D-4** responded, *"Yah, I think right now they see it as just one of those lessons they have to attend, sit down and listen. And I do think if we had technology they would respond differently."*

3.6 DISCUSSION

This discussion follows on two key factors emanating from the teachers' responses.

3.6.1 Knowledge, skills and attitudes

Consonant with the view already expressed by Chisango et al. (2020:2), adopting a constructivist pedagogic approach provides for learning conditions that promote

learner-centred pedagogy, and accommodates a facilitator role of the teacher in delivering technology-enhanced EL2 lessons.

Positive teacher beliefs and attitudes make powerful determinants, which foster ICT integration in the classroom. Teachers believed they could integrate ICT in their lessons. Despite their innate confidence, practical application of their technological knowledge and self-confidence did not match. TPACK requires of teachers the capability to combine technology, pedagogy and content knowledge to design appropriate lessons. That teachers know about and/or use technology, is not enough. It is knowing how to use ICT to teach that matters.

Data from teachers' interview responses pointed to technology use in the classroom, limited to PowerPoint and video presentations. Although the lesson observations were limited to a session per teacher per school, none of the participating teachers' enacted practices supported their purported technological knowledge as no digital tools were used. Contextually, it might be argued that the absence of technology tools and infrastructure could be a contributory factor. Nevertheless, regardless of some technology tools being at their disposal, there was no semblance of the shift towards a constructivist teaching approach.

3.6.2 Digital resources

Absence of resources could be the contextual hindrance to incorporating technology into EL2 instruction.

Limited access regarding the number of places where learners and teachers can connect to, means that both are constrained in terms of where online resources and applications can be accessed. The risk associated with failure to provide adequate resources suggests that the want of support demotivates even the teacher most enthusiastic about integrating ICT. This situation could well explain the absence of language learning activities described by Gul (2016) in the section under constructivism from teacher-lesson observations. With little or no incentive to integrate ICT, conditions for constructivist-based-instruction dissipate, and teachers continue to teach in the traditional way. Despite their supposed technological knowledge, teachers are unable to use technology to conduct constructivist-based lessons.

Circumventing the contextual factors that Mishra (2019) refers to and managing them as she suggests, becomes even a more insurmountable task for a teacher who has become despondent because of poor support, lack of training, and no resources.

Classroom lesson observations

The previous section presented findings and analysis of the data from teacher interviews. This section presents an analysis of the data from the teacher classroom lesson observations. The respondents in this case were five EL2 teachers in the 8th and 9th grades at their respective participating schools. The purpose of the lesson observations was to gather data from the real setting (i.e. the classroom) that would respond to the research questions already outlined under the interviews section. The lesson observations were also aimed at gaining first-hand experience from the setting of the actual occurrence of ICT tools and their use by the teachers in the lessons.

Each description is supported by photographic evidence. The photographs are labelled to correspond with the codes assigned to the teachers in the interviews, with the letter S added in front to denote school e.g. the code for figure 3.1 below is S1-A. It means this is the school where teacher A works and s/he was the first to be observed by the researcher.

In this section, photographic evidence of the setting where the observations were conducted is presented to corroborate the findings, and to provide a clearer understanding of how the pedagogic interaction realised within the given learning environment.

S1-A

The photograph on the left from the three below is the front view of the classroom where teacher 1-A's lesson was observed. The teacher presented a lesson on a poem to a 9th grade class, the copies of which she handed out to the learners, as can be seen on the photograph on the right.



Figure 3. 2: Classroom at school 1, S1-A

The classroom had no digital tools, and therefore in this lesson no ICT integration took place. In addition to the handouts, the teacher used the green board for written notes that supplemented her oral descriptions of the content. Meanwhile, beyond listening to her explanations, or answering the questions she asked, the learners' participation in the lesson was limited.

S2-B

The classroom at school 2 had a white board and a projector (figure 3.2). This confirmed teacher 2-B's statement in his interview.

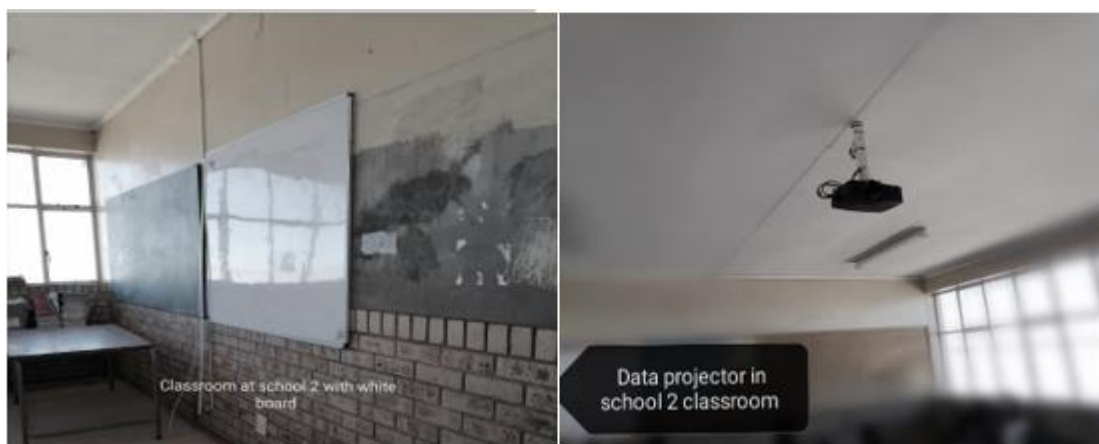


Figure 3. 3: Classroom at school 2, S2-B

The teacher presented a lesson on an advertisement to a 9th grade class. Much of the presentation was based and relied on the content from the textbook. Learners also used textbooks, which they shared in pairs per desk. The data projector and white board were not used during the lesson. The pedagogic interaction between the teacher and the learners was in the form of sporadic questions the teacher would ask, and responded to by the learners. There was no form of interaction between the learners themselves.

S3-C

Figure 3.3 shows the media centre the teacher referred to in the interview. From the teacher's account learners would be taken to the media centre for project-related school tasks or assignments that required them to use the Internet. For the observation, the lesson was about concord, with 8th grade learners. Other than for the monitor behind a sliding white board in front of the class, there was no other evidence of technology tools available in the classroom at the time of the lesson observation, such as a data projector, laptop or computer.



Figure 3. 4: Classroom at school 3, S3-C

The white board installed in the classroom was only used for notes that the teacher wrote on it. The lesson was teacher-centred, and textbook-oriented. Both the teacher and the learners had textbooks. The class's participation was limited to answering questions and echoing what other learners or the teacher were saying, while sitting and listening to the teacher.

S4-D

Teacher D-4's lesson was on analysing a cartoon. She presented to a class of 8th grade learners. There was no evidence of ICT tools in the classroom. There was a

white board installed, and there was evidence of cables meant for the installation of a data projector. The teacher used a textbook-- and so did the learners-- to which she made references and explained content-related information.



Figure 3. 5: Classroom at school 4, S4-D

The lesson was teacher-centred, and the teacher presented through lecturing to the class. For the most part, the learners sat passively while listening attentively to the teacher. The pedagogic integration of technology did not happen as there were no digital tools available to use in the classroom.

S5-E



Figure 3. 6: Classroom at school 5, S5-E

The teacher's lesson at school 5 was based on a writing a summary, and analysing a cartoon. She had a class of 8th grade learners. There was a data projector mounted on the ceiling and a white board on the front wall of the classroom. The teacher used

the chalkboard to write the aspects of the topic she explained to the class. The classroom arrangement was in the traditional manner, with learners sitting in pairs, facing the board.

There was no evidence of technology being used in the lesson by the teacher or the learners, who were fully attentive. Though the teacher interacted with the learners from time to time, asking questions and letting others confirm their answers, much of the lesson was devoted to writing on the board. I believe this was influenced by the fact that the teacher was providing corrections for the work that the learners had been given as homework. There were no visible signs of damage to the cabling or electrical installations in the classroom, such as plugs and switches. So everything seemed to be in working order. The teacher had confirmed in her interview that she used a projector with the white board in her classroom. However, for this lesson these devices, even at the most basic level, were not used.

The above section presented both a descriptive and photographic evidence of the setting where the teacher lesson observations were conducted. The purpose was to corroborate the findings, and to provide a clearer understanding of how the pedagogic interaction realised within the given pedagogic context. The section also provided the essential data from which thematic analysis was conducted.

The data analysed from the teachers' lesson observations notes revealed several common obstacles to the integration of ICT in EL2 pedagogy. These, by their nature, constituted the external factors over which teachers had minimal influence or control. There were also other barriers which emerged as factors within the teachers' realm of influence. The former included lack of ICT resources in the classrooms, while factors related to the latter were concerned with the teacher's pedagogic approaches and learner participation in the lesson.

The two themes that emerged from the analysis of the lesson observations are summarised in table 3.5 below. The themes relate only to the second research question since the first question could not feasibly be responded to by evidence adduced from the lesson observations.

Table 3. 5: Summary of themes-- lesson observations

Research questions (RQ)	Themes	Sub-themes
RQ 2: What are the barriers preventing 8th and 9th grade teachers from integrating ICT in their instruction, despite their awareness of its benefits?	No pedagogic integration of ICT. Teachers' pedagogic approach.	Resources; training. Learners listen passively; teacher lectures

3.7 SUMMARY

The preceding section presented results of the data from teachers' interviews and lesson observations. The data was gathered in response to the research question: How do 8th and 9th grade teachers integrate ICT in EL2 pedagogy in Maokeng schools? Following are the narrative summaries of the thematic analysis of the data from the interviews and the lesson observations.

Interviews

Five themes emerged from the analysis of the data from the interviews, namely: teachers' understanding of pedagogic ICT integration, teachers' perceived benefits of ICT integration, teachers' opinions about ICT integration in EL2 pedagogy and their own teaching, personal/ professional development, and barriers to ICT integration.

The teachers' rationalisation of ICT integration is reflected in the sub-themes in table 3.4. They *believed* that if they used technology, learners would benefit from a more rewarding, participatory learning experience. Their view resonated with that of Chang and Hung (2019:12) that, using ICT in L2 classrooms brings an improvement in learners' academic performance.

Some teachers had access to some forms of technology, including laptops, despite not using them. They were also aware to the advantages of assimilating digital tools into their EL2 pedagogic practices. Their failure to incorporate technology did not mean, however, that teachers did not support the view. This could be attributed to several factors which acted as the barriers that prevented them from integrating ICT, among them lack of resources and poor infrastructure. One teacher explained how lack of access to the school *Wi-Fi* rendered a monitor in his class redundant, and that

he could not buy data from his pocket. By his own confession, notwithstanding, he used WhatsApp to share content-related data with his learners, as well as task-related information beyond school hours.

Teachers disclosed that they needed more development in ICT integration. Confidence alone and teachers' purported technological knowledge are not sufficient to integrate ICT into teaching. Adhikari (2021:117) and Katemba (2020:46), supported by Mwapele et al. (2019:16), argue that poor uptake of digital tools in EL2 pedagogy is often a consequence of inadequate teacher professional development and training. Teachers need resources, training, opportunities for planning and collaboration, as well as support in developing 21st-century teaching strategies.

Lesson observations

Two themes emerged from the analysis of the data from the lesson observations. These were: no pedagogic integration of ICT, and teachers' pedagogic approach. That there was no pedagogic integration of ICT in the teachers' lessons is linked to the two related subthemes. First, resources, and second, training, both of which resonate with revelations made in the teachers' interviews.

It is logical to deduce a causal relationship between the lack of ICT tools (resources) in the classroom and the absence of ICT integration in the lesson. Likewise, with training, in that lack of training on the part of the teacher on how to integrate technology, might be the cause of the teacher not integrating technology in the lesson, even when the technological tools are at the teacher's disposal.

Regarding the teachers' pedagogic approach, two sub-themes are inextricably linked to this theme, namely learner interaction and participation, teacher-dominated lessons. It is the teacher's pedagogic approach that determines how learners are involved in the lesson. This will happen by way of the activities that are either embedded in the teacher's planning, or arise during the interaction facilitated by the teacher during the lesson.

In all the lessons that the researcher observed, learner participation and interaction was almost non-existent. To the extent that the teachers were doing all the talking and the explaining for the most part of the lessons, the approach was teacher-centric.

In a language class a teacher-dominated lesson will do the learners no good. Even in the absence of technology, innovation and creativity assist teachers in the planning of

lessons with learners in mind. The two lessons, one on an advertisement, and the other on analysing a cartoon, had the potential to be learner-centred. First, by virtue of the basic ICT tools that were available in the classroom at the school (S5-E), and second, the nature of these topics which renders them task- or project-based for learners.

Even though the pedagogic approach a teacher chooses in a lesson can be influenced by the technology that is available, the choice of what to teach and how to teach it rests with the teacher. For this reason, the use of ICT or the lack thereof should not be reason for any teacher to subject learners to a poorly planned lesson.

CHAPTER 4

ARTICLE 2: EXAMINING 8TH AND 9TH GRADE LEARNERS' PERCEPTIONS ON INTEGRATING TECHNOLOGY IN EL2 CLASSROOMS

ABSTRACT

Worldwide, resources have been invested to promote the successful uptake of educational technology in schools. Networked computers and the Internet have also supposedly transformed language pedagogy in SA classrooms and globally. Embracing this digital pedagogy in EL2 instruction calls for a fundamental change from teacher-dominated instructional approaches to ones that address 21st-century demands of learners. Approached from a constructivist paradigm, this qualitative study examines 8th and 9th grade learners' perceptions on learning with technology in the English second language classrooms. A total of 32 learners from five schools participated through focus group discussions, which were meant to obtain their experiences and perceptions with using ICT in learning English. These were supported by classroom lesson observations intended to gain first-hand perception of how learners were involved in the lessons. Thematic data analysis revealed: (1) inadequate provision of ICT resources in schools, (2) rigid anti-mobile technology practices in schools, and (3) a need for a paradigm shift towards learner-centred language pedagogy.

Keywords: English second language; constructivism; digital pedagogy; ICT integration; 21st-century learning; language pedagogy; CAPS.

4.1 INTRODUCTION

There is broad acknowledgement that the 4IR will change education and curriculum delivery modes (Elayyan, 2021:24; Hussin, 2018:92). The 21st-century workplace will be characterized by knowledge-based societies (Xu et al., 2018:91), which will require a 4IR workforce equipped with a variety of unique competencies (Prisecaru, 2016:60) for successful life and employment opportunities. 21st-century demands require persons with the ability to create, collaborate, communicate and think critically (Seitz & Hill, 2021:2235; Tican & Deniz, 2019:183; Çengel, Alkan & Çayir, 2018:875).

Subsequent to the foregoing, Sikhakhane, Govender and Maphalala (2020:706) submit that pervasive digital technologies act as catalysts that promote critical-thinking

and collaboration in learners and their teachers. Consistent with this view, Mohammed, Assam and Saidi (2020:179) assert that the acquisition of the 21st-century skills by learners, revolves around the use of second-generation Web (Web 2.0) tools. Web 2.0 refers to digital tools, which include Web-based communities, social-networking sites, video-sharing sites and search engines. In addition to being the ideal means to enhancing 21st-century skills, the authors argue that such technologies can be efficiently deployed to develop the language proficiency of L2 learners.

The educational deployment of digital technologies is further recognised by UNESCO (2016) - that ICTs in education provide equity and universal access to quality learning and teaching. Moreover, integrating technology in L2 classrooms greatly improves learners' academic performance (Chang & Hung, 2019:12). Fundamental to the 21st-century skills, is digital learning (DL). The core of DL lies in incorporating technology to facilitate learning (Sikhakhane, Govender & Maphalala, 2020:706). Learning with technology promotes an autonomous learning approach (Muianga, Klomsri, Tedre & Mutimucuo, 2018:47), while Web 2.0 and e-learning tools may enhance Student-Centred Learning (SCL) (Tarbutton, 2018:5). SCL refers to active learning, where the learner is "no longer a mere receiver of information, but is highly encouraged to interact and create content, share it and collaborate with others" (Mohammed, Assam & Saidi, 2020:179). This view is congruent with the shift towards a 21st-century learning paradigm advocated by Sikhakhane, Govender and Maphalala (2020) (as shown in Figure 4.1). According to the authors, 21st-century pedagogy or learning is learning that develops competencies and skills through collaboration, technologies and modern methods of supervision and assessment that promote learner-motivation and the desire to learn. Therefore, integrating Web 2.0 tools in EL2 instruction is a 21st-century, student-centred approach.

English is a significant language in the SA school system (Chetty, 2019:246). Its importance is threefold. First, fluency in English is associated with gaining competitiveness in tertiary education and in employment (Stein, 2017:215). Second, for many learners it is the LoLT. Third, those learners whose LoLT is not English, choose English as a L2. In this way, English dominates the SA basic education language landscape. The global footprint of English also makes it an important language as an international lingua franca (Chehimi & Alameddine, 2022:102).

SA has its own basic education challenges. There are widespread literacy deficiencies and resultant academic inadequacies among many learners in public schools. This is referenced in several large-scale assessment (LSA) reports (compare TIMSS in a report by Reddy et al. (2019); SACMEQ IV (2017) and PIRLS in Howie et al.'s (2017) report. One contributory factor to the poor academic performance is reported to be learners' weak literacy skills, spawned by poor linguistic competence, mainly in English. Literacy is a foundational skill linked to reading comprehension and writing. From the perspective of language learning and technology, it becomes a necessary skill for the 21st-century, as it is connected to learner autonomy, creativity, communication and collaboration (Kern, 2021:135).

In light of the foregoing, a change to the new learning paradigm, characterised by 21st-century learning, becomes an imperative. According to Lazarov (2018:13), this change propagates 21st-century learning, which promotes learners' capacity to succeed in the 21st-century workplace. 21st-century pedagogy recognizes the transformative power of technology in learning. For meaningful improvement in language learning to take place, this transformative power must transcend some inherent learning boundaries in many EL2 classrooms. Mncwango and Makhathini (2021:17) identify these learning boundaries among others, as poor diction and conceptual skills, lack of vocabulary, and grammatical errors in writing and speaking. Integrating digital technologies in the classroom may not provide *the* answer to SA's EL2 pedagogic challenges. However, for learners to make the most of 21st-century world-of-work and education opportunities, there needs to be transformation in how they learn, to acquire 21st-century skills and knowledge (Chehimi & Alameddine, 2022:103; Mohammed, Assam & Saidi, 2020:179).

4.2 RESEARCH CONTEXT AND PROBLEM STATEMENT

The success of incorporating technology in education in countries around the world, reveals that formulating strategies for technology in education is among the leading educational activities (Kian, 2019:283). Of these, China (Zeng, 2022:1063), Australia and Finland (Kian, 2019:383), are arguably the most advanced in the pedagogic integration of ICT.

Many other countries worldwide have invested substantial capital for launching and advancing various ICT-in-school programmes. For example, in Chile, there has been strategic improvement in educational ICT by the Ministry of Education since 1992 to

enhance equity and quality in public education (Crossley & McNamara, 2017:24). In 2013, Malaysia developed the Smart School Qualification Standards (SSQS), which were intended to cultivate an efficient uptake of technology in education (Ministry of Education Malaysia, 2013). The Thai Government introduced a variety of policies to promote ICT uptake in education (UNESCO Bangkok, 2013). The Government of Singapore developed the Masterplan for using technology in schools, which asserted that all learners should access an ICT-rich school environment, regardless of their socioeconomic background (Infocom MDA, 2018).

In 2003, the Department of Education (DBE) in South Africa, recognised the significance of learners acquiring 21st-century skills. As a result, the DBE turned to modern technologies to enhance the quality of education (Graham et al., 2020:749). Moreover, the DBE has formed partnerships with other education stakeholders, by offering various programmes. These include Microsoft's TTRO (The Training Room Online), which gives learners access to digital content and teachers the space to manage learner development; NECT (National Education Collaboration Trust), through its Remote and Digital Learning Programme, and The Vodacom Foundation's Virtual Classroom, which offers learners and teachers connectivity and digital skills. However, in examining whether there had been a paradigmatic change in improving meaningful pedagogical practices in some South African secondary schools, Sikhakhane, Govender and Maphalala (2020:710) discovered that less-interactive, teacher-centred instruction still largely persisted as a common pedagogic approach in many schools, while learners remained inactive.

Retrospectively, a study by Jacobs (2018:56), to establish the status of technology as well as the pedagogic integration thereof in the FS Province, revealed that among the five districts in the FS, the Fezile Dabi District ranked fourth. Compared to other districts, many schools in Fezile Dabi did not have internet connectivity for instructional purposes of teaching and learning in classrooms. Neither teachers nor learners could access resources online. Where connectivity was available, it was restricted largely to the administration block. In general, access to ICT equipment and infrastructure was limited. At the same time, teachers were unfamiliar with the tools that could be associated with technology integration, while the rate of learner exposure to ICT activities was low (Jacobs, 2018:56). Hitherto, material conditions on the ground prove

that there has been no significant improvement in this regard, as revealed in recent studies by Hart (2023) and Zungu (2022).

Why focus on learners? Learning benefits of integrating technology in EL2 pedagogy are acknowledged and documented in many studies. In SA, research in this field has focused on pedagogic practices, mainly in institutions of higher learning or, in basic education, in senior grades (10-12), or on teachers. As a result, little is known about learners' experiences and perceptions with using technology in EL2 classrooms in schools, especially in 8th and 9th grades.

Against this background, this study examined the extent to which learning was mediated through technology in 8th and 9th grade EL2 classrooms in Maokeng schools. The study further explored the learners' experiences and perceptions in using technology.

In the 8th and 9th grades, learners continue to strengthen their listening, speaking, reading and writing skills in EL2 (DBE, 2012:9). EL2 is also a fundamental subject in these grades, with a threshold of 40% to qualify for promotion to the next grade. DBE (2012) advocates using the L2 for purposes of thinking and reasoning to develop the learners' interpersonal and cognitive academic skills. Learners need these skills in studying other subjects like Technology, Life Orientation and others in English. The fact is, many learners in the 8th and 9th grade still exhibit shortcomings in their second language (DBE, 2012:9), which adversely impact their communicative and cognitive abilities.

The research question that guided this investigation was:

What are 8th and 9th grade senior phase learners' perceptions on using ICT in EL2 pedagogy in Maokeng schools?

This was supported by the two sub-questions, namely:

1. How is ICT integrated in senior phase EL2 pedagogy in Maokeng schools?
2. What are the barriers preventing senior phase learners from using ICT in EL2 pedagogy in Maokeng schools?

4.3 THEORETICAL/CONCEPTUAL FRAMEWORK

The theoretical foundation for this inquiry is constructivism. Its relevance is in due consideration of principles of learner-centred language learning. In addition, the

researcher posits that a constructivist learning environment supports optimum conditions for learners to acquire 21st-century skills and competencies.

Constructivism

Constructivism derives from a combination of various theoretical forms by Piaget (individual and cognitive constructivism), Vygotsky (social constructivism) and Von Glasersfeld (radical constructivism).

According to constructivist learning, learners actively construct their own knowledge (Chauke & Tabane, 2021:2), which is the one common basic element the various forms of constructivist theories all subscribe to (Abderrahim & Gutiérrez-Colón Plana, 2021:39). Critical-thinking, collaboration, creativity, communication and active learning are 21st-century attributes (Demirkol-Orak & İnözü, 2021:981), consistent with constructivist learning.

Active learning, through discovery and construction of knowledge, positions learners centrally in the learning process. Student-centred learning is a characteristic of 21st-century pedagogy (depicted in Figure 4.1). 21st-century pedagogy is considered a more effective instructional approach compared to traditional, direct instruction, now considered outdated in many parts of the world.

In the classroom, learning is impacted by a didactic environment, promoted by the teacher. Additionally, learning becomes significant and fruitful (Vygotsky, 1978) when it supports interactive and cooperative activities among students (Panhwar, Ansari & Ansari, 2016:185). Though not necessarily key to the purpose of this study, this approach signposts the constructive role of the teacher. Demirkol-Orak and İnözü (2021:992) define the teacher's role as facilitator who nurtures active learning and presents interesting content. Tomljenović and Vorkapić (2020:15) and Mutekwe (2018:61) concur that today, the teacher's new role is seen as that of mediator, who facilitates pedagogic activities, during which s/he indirectly guides and supports students to investigate, discover, and make deductions. In their new role, teachers need to incorporate 21st-century competencies in their instruction (Seitz & Hill, 2021:2247; Shafie et al., 2019:29). For this reason, Tican and Deniz (2019:183) argue, that they must have the ability to incorporate 21st-century learner competencies in their instructional strategies.

The mediator/facilitator role of the Teacher Didactically decentralises the teacher, as the learner is strategically centred within a constructivist learning environment. This constructivist environment takes the social context of language learning into consideration. Particularly in placing the learner at the centre, this learning approach promotes an autonomous learner, who can cooperate with others, as argued above by Abderrahim and Gutiérrez-Colón Plana (2021:39), Roblyer and Hughes (2019:44) and Panhwar et al. (2016:185). Co-construction of knowledge happens through cooperative and collaborative learning, as well as through negotiating with others.

Using instructional technology helps to mediate conditions ideal for constructivist L2 pedagogy. In these conditions, Donald, Lazarus and Lolwana (2011:54) posit that a learner seizes the opportunity to cognitively construct knowledge. Accordingly, integration of digital technologies to promote learning beckons on teachers to fundamentally change from the teacher-directed pedagogic methods (Coşanay & Karali, 2022:19; Crossley & Mcnamara, 2017:434), to techniques that permit active, technology-based and constructivist student learning (Crossley & Mcnamara, 2017:20).

The intersection between ICT integration and constructivist L2 learning is highlighted by several authors. Kaya (2015:5) argues in this respect that it assists in the creation of ideal learning conditions. Tarbutton (2018:5) expatiates on Kaya's argument that this presents opportunities for differentiated teaching and transforming teacher-centred classrooms to more learner-oriented ones. Chehimi and Alameddine (2022:104) and Mohammed, Assam & Saidi (2020:179), motivate that it promotes learner collaboration, and encourages critical-thinking and problem-solving, as in Figure 4.1. Thus, learners take responsibility for their own learning.

Pedagogic integration of ICT is a phenomenon congruent with the concept 'digital pedagogy' (Nanjundaswamy, Baskaran & Leela, 2021:181). Digital pedagogy is considered part of an approach that is termed 21st-century pedagogy, illustrated in Figure 4.1 (Dlamini & Mbatha, 2018:17). With 21st-century pedagogy, digital tools are aptly infused into instruction to enhance learning, a view espoused by Chehimi and Alameddine (2022:103) and Väättäjä and Ruokamo (2021:2).

In considering the learner's role in a technology-enhanced, constructivist L2 learning environment as described above, Eggen and Kauchak (2016:45) postulate that it is directly related to and based on social interaction. This view aligns well with Vygotsky's

(1987) social constructivism theory and Bruner's (1966) theory of learning. Both recognized the social context of learning, and of language learning in particular, with regard to Bruner. The teacher's responsibility, as already alluded to, is to create optimum conditions that permit the learning of the fundamental skills - listening and speaking, reading and writing - by senior phase learners, with the aid of educational technologies.

Eggen and Kauchak (2016:45) have described the importance between social interaction and a constructivist, digital L2 learning environment. Regarding learners' role and learning with ICT, Bozkurt and Ataizi (2015:158) argue in favour of the deployment of Web 2.0 tools in language pedagogy contexts, Web 2.0 tools to help eradicate inefficient, teacher-directed instructional methods and usher in autonomous, learner-oriented techniques. Web 2.0 tools enable content creation and sharing among learners. Through Web 2.0 and social media platforms, learners can connect with their teachers and collaborate with their peers, to the advancement of their language skills. Bozkurt and Ataizi's proposition consolidates what Chehimi and Alameddine (2022:104), Sikhakhane, Govender and Maphalala (2020:708) and Kaya (2015:5) advance, all of which contribute to a constructivist, student-centred ICT-based learning.

Following is a summary of some of these tools and how they can be used in a learner-centred approach, according to Gebhard (2017:117):

- Twitter (now X): communication
- A wiki: collaboration and interaction between learners and teachers
- Digital: multimodal digital media production
- Blogging: reading, writing and project-based learning
- Cellphone: online dictionary, role-play
- YouTube: viewing and listening

In addition to transforming our knowledge of what transpires in classrooms, Web 2.0 presents excellent prospects in acquiring and learning English, together with the capacity to enhance learners' general language competence (Rwodzi, De Jager & Mpofu, 2020:4). In this way, it may contribute towards improving learners' academic performance, as stated by Chang and Hung (2019:12).

4.4 METHODOLOGY

RESEARCH DESIGN

This study applied a qualitative approach to investigate how 8th and 9th grade learners used technology in the English L2 learning environment.

Following a phenomenological design, the researcher examined the occurrence of ICT resources in the EL2 classrooms and how 8th and 9th grade learners used them during the English lessons. The study further explored the learners' perceptions on using technology in learning EL2. 32 learners from five secondary schools (identified as 1, 2, 3, 4 & 5 in the study), were purposefully selected within the Maokeng residential area in Fezile Dabi education district.

The researcher visited the learners after formal tuition hours at their respective schools to conduct focus group discussions arranged through their English teachers. Direct lesson observations were conducted during each teacher's English period for understanding and capturing the context in which teaching and learning occurred, and gaining first-hand experience with the setting. COVID-19 Standard Operating Procedures (SOPs) were all followed.

DATA COLLECTION

Focus group discussions

Guided by tenets of constructivism, data collection entailed focus group discussions with individual learner groups, followed by a lesson observation on dates and times mutually agreed upon between their teachers and the researcher (table 4.1).

Table 4. 1: Learners' focus group discussion schedule

Focus group discussion schedule			
Group	Date	Time	Duration
1-A	26/05/22	14:30	87mins.
2-B	04/05/22	14:30	86mins.
3-C	23/05//22	14:30	96 mins.
4-D	01/06/22	09:10	90 mins.
5-E	03/05/22	11:20	94 mins.

The groups, which are shown in table 4.1 above, were given the codes 1-A, 2-B, 3-C, 4-D, and 5-E. In the code, the number refers to the learners' school, and the letter indicates the group itself. Table 4.1 also shows the dates, times and duration of each group's discussion.

The discussion questions comprised both open- and closed-ended items. All the respondents were assured of their anonymity and the privacy of their own identities and those of their schools. The questions sought to stimulate discussion and invite learners' views on types of digital devices they had, and those that they used in the EL2 learning classroom, the impact they believed technology made in their EL2 lessons, and the extent to which the technology was used for learning. The questions had been piloted to help gauge challenges that were likely to be encountered and how to mitigate them. The pilot involved a combined group of eight 8th and 9th grade learners, who were interviewed at one of the participating schools. Learners from this group did not participate in the interviews that were later conducted as part of the data collection.

Lesson observations: learners

The researcher conducted the learner observations following the same schedule as the teachers' lesson observations. These were conducted during school hours at the

participating schools. Direct lesson observations were conducted during each teacher's English period for understanding and capturing the context in which teaching and learning occurred, and gaining first-hand experience of the setting. The observations followed-on on the focus group discussions, and were intended to study the involvement of the learners, and their interactions during the lessons. From all these observations, field notes were taken and own reflections noted down.

The following is the schedule for learner lesson observations.

Table 4. 2: Learners' lesson observation schedule

LESSON OBSERVATION					
Teacher	Date	Topic	Grade	Time	Duration
1-A	26/04/22	A poem (The Will)	9	9:30	40 mins.
2-B	06/05/22	An advertisement	9	09:20	40 mins.
3-C	09/05/22	Concord	8	11:10	40 mins.
4-D	11/05/22	Analysing a cartoon	8	08:00	40 mins.
5-E	13/05/22	Writing a summary; analysing a cartoon	8	12:10	40 mins.

This section presents an analysis of the data from the learner focus group discussions. The data presented, and the analysis thereof, will in many respects be similar to the data and analysis presented in the same section under 3.6. The respondents in this case were learners in the 8th and 9th grades at the respective participating schools.

ANALYSIS AND INTERPRETATION OF THE DATA

The data were transcribed verbatim from video-recordings of each participant. The researcher read through the data from the first participant, writing reflective notes and annotations. Moser and Korstjens (2017:8) advise that by reading and re-reading the data, possible theme and categories might emerge.

Based on this, thematic analysis was used in this study for identifying recurring themes and categorizing the datasets in relation to the research objectives. Data

generated were thematically coded, transforming it into categories and themes. Subsequently, conclusions were drawn, based on observations from the transformed data.

The data, which were collected using focus group discussions and classroom lesson observations, were intended to respond to the research questions that follow:

The research question that guided this investigation was:

What are 8th and 9th grade learners' perceptions on using ICT in EL2 pedagogy in Maokeng schools?

This was supported by the two sub-questions, namely:

1. How is ICT integrated in 8th and 9th grade EL2 pedagogy in Maokeng schools?
2. What are the barriers preventing 8th and 9th grade learners from using ICT in EL2 pedagogy in Maokeng schools?

PARTICIPANTS

The sample population comprised 32 senior phase learners in 8th and 9th grades from each of the five participating schools in the Maokeng residential area. They were selected according to the following quota sampling characteristics:

- They were direct beneficiaries of the aim and objectives of the study, and directly affected by ICT integration practices in the EL2 classrooms.
- They were selected on the basis that they would be motivated and communicate at length and in depth with the researcher on the phenomenon of ICT integration (Vasileiou, Barnet, Thorpe & Young, 2018:2). Moser and Korstjens, (2017:2) add that they should be participants who can articulate and reflect, and supply the richest information.

The learners participated through focus group discussions which were meant to solicit their experiences on using ICT in learning English. Participating schools were purposefully selected on the grounds that they were public schools, hosting 8th and 9th grade learners. The researcher's choice was motivated by the belief that recommendations from the research would possibly be of more benefit to this category of schools, if implemented, by enhancing the quality of EL2 instruction. The learners were chosen on the grounds that they, at the time of the inquiry, were taking EL2 in 8th or 9th grade.

The learner groups were assigned the codes in table 4.3. The number represents the school where the learners attend, while the letter indicates the learner groups.

Table 4. 3: Learner information

Participants groups	Age	Grade		Gender		Population group
		8	9	M	F	
1A	15-16	3	4	2	5	African
2B	14-16	4	2	3	3	African
3C	14-16	3	4	4	3	African
4D	15-16	3	3	4	2	African
5E	14-15	2	4	3	3	African

Since focus group discussions with the learners would be held after school hours, another consideration was that the selected learners should be available at this time.

LIMITATIONS

The following limitations were present in the study:

1. The study group was limited only to 8th and 9th grade EL2 teachers within the Maokeng area. The researcher has also taught in these grades. These grades are part of the senior phase where there is paucity of research in this field.
2. The schools were in quintiles 2 or 3. Both quintiles represented poor public schools, with 2 being poorer than 3. Due to their socio-economic status, these schools would benefit more from any forms of intervention than would schools in quintiles 4 and 5.
3. Constraints of time limited the time for data collection. Access to the participants depended on their availability only at the given times. More lesson observations and interviews would have contributed to the richness of the data generated.
4. The teacher population sample was limited only to 5. This limited the scope of the data collected as a bigger sample would have increased the scope.
5. The data gathered were triangulated through semi-structured interviews, lesson observations and field notes to enhance the quality.

ETHICAL CONSIDERATIONS

This study received ethical clearance from the Research Ethics Committee of the University of the Free State.

The key principles of respect, justice and beneficence were adhered to in the study design, sampling procedures, and within the theoretical framework, research problem and questions.

The voluntary nature of the study meant that the teachers gave written consent to participate in the study. Consent from participants was gained on grounds of participant anonymity, including concealing their identity and that of their schools, using numbers and letters. Permission to conduct the research at the schools was granted by the Free State department of education and the principals of the individual schools which served as sites for the investigation.

Data from the study will be kept confidential. Hard copies will be kept under lock by the researcher for a period of five years. Electronic information will be stored on a password-protected computer. The researcher will incinerate all the redundant hard copies, and the soft copies will be deleted.

Equally, the following safeguards were employed to protect the participants' rights (Cresswell & Cresswell, 2018:329):

1. Research objectives were communicated in verbally and in writing so that they were clearly understood by the participants.
2. The participants were informed of all data collection procedures.
3. Verbatim transcriptions were made available to the participants upon request.
4. Participant anonymity was considered when capturing and reporting the data.
5. The section that follows describes and defends the procedures the researcher used to determine the trustworthiness of the results.

TRUSTWORTHINESS

The importance of trustworthiness lies in the actions the researcher took to make the results authentic, namely credibility, transferability, and dependability.

CREDIBILITY

The researcher used triangulation to maintain the consistency of the findings and minimise bias. Triangulation was performed through focus-group discussions and lesson observations.

TRANSFERABILITY

To establish transferability, the researcher worked with a manageable, purposefully selected samples learners to investigate the phenomenon of ICT integration within the specific context of the school. In this way, the themes that were identified could be applied in contexts that share the same characteristics.

DEPENDABILITY

The researcher made the research process transparent and systematic by describing the steps taken to collect, analyse, and interpret the data. These steps minimised inconsistencies and errors so that the study would return same results if repeated under the same conditions.

The preceding section outlined the methodology the study followed in generating the data that would address the research question or problem. Following a phenomenological design, the researcher examined the nature of challenges faced by 8th and 9th grade senior phase learners, including their attitudes in using technology to enhance EL2 instruction.

In the next section, the results from the analysis of the focus group discussions will be presented, followed by those from classroom lesson observations and the analysis of the data.

4.5 RESULTS/ FINDINGS

This article explored the integration of ICT in EL2 pedagogy by seeking to respond to the research questions below. The research question that guided this investigation was:

What are 8th and 9th grade senior phase learners' perceptions on using ICT in EL2 pedagogy in Maokeng schools?

This was supported by the two sub-questions, namely:

1. How is ICT integrated in senior phase EL2 pedagogy in Maokeng schools?

2. What are the barriers preventing senior phase learners from using ICT in EL2 pedagogy in Maokeng schools?

The previous section focused on learners' focus group discussions, and their responses to the discussion questions in Appendix 2. In the following section the results from the analysis of the focus group discussions data are presented, followed by those from classroom lesson observations. The data analysed from the learners' focus group discussions revealed common perceptions on the use of ICT for learning purposes in the EL2 classroom. This included some examples of digital devices, and how they perceived their usefulness in learning English. The data also included the factors that constituted barriers which prevented the use of ICT by the learners in the EL2 classrooms. The themes that emerged from the analysis of the focus group discussions data are summarised in table 4.4.

Focus group discussions

Table 4. 4: Summary of themes-- focus group discussions

Research questions (RQ)	Themes	Sub-themes
RQ 1: How is ICT integrated in 8th and 9th grade EL2 pedagogy in Maokeng schools?	Lack of technology. Technology as a learning aid.	No digital devices; use of textbooks; oral pedagogy. Assistance to learners; writing aid.
RQ 2: What are the barriers preventing 8th and 9th grade learners from using ICT in EL2 pedagogy in Maokeng schools?	Management of devices.	Anti mobile technology policy; learners' misuse of cell phones; safety risks and theft of devices; ground rules

The following are the themes that emerged from thematic coding of data from learner focus group discussions:

Theme 1: Lack of technology

Learners were asked what digital devices they used in the English L2 classroom for purposes of learning, and how they used them. All the groups mentioned that they used no digital devices in the English class. *“There are no devices used in the English class”*, was a response from **1A**. *“There are no digital devices, we rely on oral teaching”*, replied learners from **3C**. **5E** laconically stated: *“None. We use only textbooks.”* In **2B**’s class some devices were used, but not by the learners, who indicated: *“Learners do not use any devices in class.”* In the same group, another learner added: *“She shows us work on the white board for remedial and class tests. She uses a textbook for teaching.”* When asked what activities they had done in the English classroom using technology, one of the **2B** learners iterated, *“Summarising a story and only writing a class test. We always use textbooks”*. When probed further to explain how they did the summary and the class test, a learner from the group stated, *“The teacher showed us the extract of the story from her laptop with a projector”*, and another added, *“We wrote the summary in our books”*. The same was said about the class test, which learners said was also projected on the board by their teacher. Some in **4D** responded: *“In English we use technology very rarely, so much that we cannot mention any activity.”* Others here added: *“None”*.

Theme 2: ICT as a learning aid

All learners overwhelmingly supported the idea of using ICT technology in EL2 classrooms. They believed technology would make a difference in their learning of English by making the work “easier to understand”. Especially their responses pointed to functions on devices related to writing skills, with reference to word-search for meanings of difficult words and auto-correct for spelling. As one **1A** learner put it, *“It can help with spelling, for example when writing an essay, I can go on the cell phone to correct my spelling.”* Another learner added: *“Sometimes there are difficult words. We would be able to search for the words and find the meanings, and that would make our work easier.”* Some in **2B** thought using technology would help slower learners: *“There are slow learners, some are slower, and technology would help with spelling-check and auto-correct.”* Watching videos was also seen by different groups as a strategy to accommodate other learners. Group **4D** stated, *“As learners, we are different. Some take longer to understand. Videos could help*

children with different learning styles.” 5E learners said, “When we see something on a video, it’s different from just listening to the teacher. I can learn it better because I see it and hear it at the same time.”

Theme 3: Management of devices

Learners believed integrating technology in EL2 lessons was hindered by several factors. Their views largely focused on cell phones. They saw learners’ wrongful conduct with cell phones as the barrier to using this digital tool in the classroom. One of the groups, **4D** explained: *“When we bring cell phones, some learners record teachers in class, and post their videos on social media.”* **5E** stated, *“Learners’ poor conduct. Some learners take pictures of the teacher and post them.”* In the words of one learner from **3C**: *“Learners’ misbehaviour contributes. A lot of learners not concentrating in class discourages teachers from using technology.”* In addition to learners’ conduct serving as a deterrent, there were common feelings among the groups that theft and damage to devices were other barriers to technology integration:

“Another issue is theft and safety of devices, because some learners steal and break our phones,” stated **1A**.

“Some learners steal from others, and break things in class,” said another **1A** learner.

“...theft of the devices, damage and vandalism of cables and infrastructure,” were **2B’s** words. However, learners also acknowledged that there was a need for the existence of rules in the classroom to create a climate suitable for meaningful assimilation of instructional technologies. As stated by **2B**: *“Cell phones can be a cause of distraction, especially if the Teacher Does not set ground rules for their use and enforce them.”* A view from **5E** went, *“We should also follow the rules set in class if the teacher is using technology so that there is order.”* Moreover, the establishment of classroom rules by learners themselves, was seen as a mechanism to also combat loss and damage to ICT tools, as articulated here further by **5E**: *“We can set some rules in class for the safety of tablets if broken or lost.”*

Learners were also cognizant of their teachers’ disposition towards integrating technology in English lessons. They spoke of their teachers as follows: *“They still prefer doing things the old way, so they don’t like to use technology”*, iterated **3C**, and, *“Some teachers prefer chalkboard. Many teachers still prefer to use textbook,”*

were words from **4D**. These statements were congruent with the learners' earlier testimonials that there were no digital devices used in their English classrooms, save for the class test and summary writing incidents. The statements also confirmed the BBT perception mentioned earlier that the teachers had of themselves about lagging behind with technology. Some of the learners were of the view that their schools' failure to provide ICT resources was one of the reasons hindering integration of technology in their English L2 lessons. Conversely, others noted that there were some resources available in their schools, such as a computer centre at one school (School 2) and a media centre at another (School 3). However, there was no direct connection between these facilities and English L2 lessons. As learners from **4D** lamented: *"There is only a technology lab for CAT (Computer Applications Technology) learners."*

All the schools participating in this study, as previously indicated, were in quintile 3, except for one, which was in quintile 2. Both quintiles meant the socioeconomic station of the school and its community was poor. Furthermore, the learners in **1A** indicated, *"some parents can't afford to buy their children devices, so we think the school should provide devices for all learners."* Others added: *"We want the school to give us tablets, which we will return after use."*

To remedy the situation, most learners thought their schools should change their cell phone policies, which in their current form prohibited them from bringing cell phones to school. So, when asked what ICT changes they would make in the manner learning English was happening in their classrooms, some from **1A** responded: *"We would bring our own cell phones."* Learners from **2B** replied, *"To use cell phones at school."* From **5E** learners said: *"Bringing cell phones to class."*

Learners believed cell phones would assist them in various ways in the classroom. Some of the ways already mentioned, were accessing the online dictionary and helping slower learners with videos and pictures to present and interact with learning content. In addition, they intended taking pictures of work written on the chalkboard - as it often got erased before they finished writing it down.

4.6 DISCUSSION

Findings from the senior phase learners' experiences and perceptions above point to several variables impacting the uptake of ICT in EL2 instruction. Learners' account

highlights apparent non-utilization of digital technologies in English L2 pedagogy. Two significant factors emerge from the findings: *context* and *learner autonomy*.

4.6.1 Context

Theoretical underpinnings of both constructivism and 21st-century pedagogy, support constructivist learning and the technological integration of digital technologies in English language instruction.

Lesson observations conducted during English L2 lessons revealed the absence of ICT integration in the English L2 classrooms. Availability of ICT resources at school, or even the lack thereof, is a contextual factor that impacts both teachers' and learners' access to digital tools. The reality is, without technological resources, there will be no enabling technologies to promote 21st-century learning and the development of higher cognitive skills inside the EL2 classroom, as espoused by Seitz and Hill (2021:2234), Tican and Deniz (2019:183) and Çengel et al. (2018:875). Meanwhile, teachers' inability to integrate 21st-century competencies in their instruction, because of lack of ICT resources, also means that opportunities for learners to engage with any amount of technology-mediated learning are compromised.

Learners were prohibited from using or bringing cell phones to school. The rigid "no cell phone" policy practised by the schools also meant that no other devices, such as tablets were permitted for learners. Added to teachers' poor technological knowledge and its consequences for 21st-century learning as aforesaid, this rigidity implies few teachers are encouraged to leverage making a shift towards a constructivist, technology-based pedagogic approach. Many learners have cell phones and other mobile devices. Considering the pervasive nature of these digital tools and their value to mobile learning, as enunciated by Chang and Hung (2019:13), schools could consider a more flexible attitude towards their use for educational purposes. Perhaps a change to "Bring Your Own Device" (BYOD) approach, supported by school-based policy and pedagogical guidelines, could go a long way in mitigating the shortage of ICT tools faced by schools.

Furthermore, as suggested by Charles and Pecorari (2016:85), the use of multimedia resources and mobile devices in language learning, promotes reflective and autonomous learning. Charles and Pecorari (2016) further maintain that using ICTs

and Web 2.0 tools, described earlier by Rwodzi, De Jager & Mpofu (2020:4) and Bozkurt and Ataizi (2015:158), has a positive impact on whether learners can collaborate, upload their work and share it with others. These assertions substantiate what learners stated in the preceding section regarding what kind of digital devices they owned and how they used them.

4.6.2 Learner autonomy and collaboration

Learner autonomy and collaboration are among the most quoted advantages related to pedagogic use of technology. Learner autonomy encourages learners to work independently from the teacher. They manage and channel their actions to achieve learning goals. Collaboration results from students working cooperatively on tasks, while socially interacting, reflecting, and incorporating prior experience in the meaning-making process (Roblyer & Hughes, 2019:44). Constructivist learning and use of technology in English L2 learning helps create ideal conditions where learners can work autonomously and collaborate with others (Tomljenović & Vorkapić, 2020:17).

It is therefore a significant finding that during the interviews, learners were conscious of the fact that the English L2 lessons were conducted using textbooks and the chalkboard. There was no technology incorporated into the lessons, nor opportunities created for learners to use it. The teacher talked for the better part of the lesson while learners sat passively. Lack of technology integration meant learners missed on the opportunity to engage in digital learning. They were also unable to engage in interactive learning activities. All in all, what this equates to, is learners who are continuing on a production line of didactic techniques that fail to improve their creativity, collaboration, critical-thinking and communication skills (Çengel et al., 2018:875). Sikhakhane, Govender and Maphalala (2020:705), aptly put it: “It compromised on active learner-academic performance and making a meaningful significant intellectual achievement. This resulted in production of ‘mediocre’ human capital ill-prepared to face the 4IR challenges.”

4.7 SUMMARY

DBE (2015:30) sets 27 goals to achieve better basic education in South Africa. Goals 16 and 20 respectively aim to “improve the professionalism, teaching skills, subject knowledge and computer literacy of teachers throughout their entire careers”, and “increase access amongst learners to a wide range of media, including computers,

which enrich their education.” In theory, these ideals sound profound. The reality is, many South African public schools continue to face the predicament of lack of digital infrastructure, no internet access in the classroom and the necessary ICT tools, such as data projectors (Padayachee, 2017:51).

Within this context, integration of technology in senior phase EL2 pedagogy in Maokeng schools remains a challenge to teachers and learners alike. The poor access to ICT resources and the presumed incompetence on the part of English L2 teachers means teachers are unable to incorporate ICT and therefore promote 21st-century competencies through their instruction. For learners, these unfavourable learning conditions frustrate the development and acquisition of the metacognitive and social skills of creativity, collaboration, critical-thinking and communication, which are needed as competencies for 21st-century learning (Seitz & Hill, 2021:2235). The purpose of mediating learning in the EL2 classroom with technology can but only be one: to improve learner performance. As for the extent to which this happened, it is tantamount to zero.

21st-century learning requires fundamental changes towards pedagogical strategies which can enrich learners to make them succeed in the 4IR (Sikhakhane, Govender & Maphalala, 2020:708). These shifts imply a digital curricular revolution by the DBE to realign and enforce 21st-century pedagogy in accordance with its e-Education and e-Learning policy intents. In addition, management of change towards ICT integration in schools within the Fezile Dabi District should be strengthened and monitored to ensure that: (1) the requisite digital infrastructure and resources are available in schools, (2) EL2 teachers receive the required development and training in digital pedagogy, and (3) proper advocacy for parents and digital literacy education for learners, are conducted.

Otherwise, without a revolutionary shift, the vision of an education and 4IR curriculum modes advocated by Hussin (2018:92) and Xu et al. (2018:91), meant to usher in an era of learners equipped with compatible knowledge and skills, remains but an illusion.

The preceding section presented results of the data from teachers’ interviews and lesson observations. The data was gathered in response to the research question: How do 8th and 9th grade teachers integrate ICT in EL2 pedagogy in Maokeng schools? Following are the narrative summaries of the thematic analysis of the data from the learners’ focus group discussions and the lesson observations.

Focus group discussions

Three themes emerged from the analysis of the data from the focus group discussions, namely: lack of technology, technology as a learning aid, and management of devices.

The learners' rationalisation of ICT integration and barriers impacting it are reflected in the sub-themes in table 4.4.

The absence of digital tools in the EL2 classroom explains why there was no ICT integration in the lessons. Sabiri, (2020:182), Alhumaid, (2019:16), and Louw, Rankhumise and Maimane, (2019:305) describe this an external barrier that hinders the integration of ICT by teachers. The inadequate provision of educational ICT in SA schools also means the uptake of technology cannot occur (Hart, 2023:8). The situation needs to be corrected as providing teachers with ICT support, helps them concentrate more on mediating instruction for the benefit of their learners than worrying about ICT inadequacies (Crossley & Mcnamara, 2017:14).

Providing teachers with adequate resources increases opportunities of choice and variation in pedagogic approaches for teachers. Instead of relying on a textbook, can use the resources at his/her disposal to differentiate instruction and accommodate learners' different learning styles. The oral pedagogy that learners experienced might well be a symptom of the traditional ways of teaching the teachers are said to be still holding on to. Resources are not the only form of support teachers should be given. They also need technical and pedagogical support (Hart, 2023:13; Dlamini & Mbatha, 2018:28), and time for training and development (Dlamini & Mbatha, 2018:18).

Learners' ill-discipline in the use of technology can be attributed to lack of digital literacy. Digital literacy includes skills, knowledge and behaviours that we use with various digital tools, such as smartphones, laptops, tablets and desktop computers (Gerbhard, 2017:115). Like teachers, learners need support and education to help them acquire the necessary competencies to work responsibly with technology.

Lesson observations

Two themes emerged from the analysis of the data from the lesson observations. These were: no pedagogic integration of ICT, and teachers' pedagogic approach. That there was no pedagogic integration of ICT in the teachers' lessons is linked to the two related subthemes. First, resources, and second, training, both of which resonate with revelations made in the teachers' interviews.

It is logical to deduce a causal relationship between the lack of ICT tools (resources) in the classroom and the absence of ICT integration in the lesson. Likewise, with training, in that lack of training on the part of the teacher on how to integrate technology, might be the cause of the teacher not integrating technology in the lesson, even when the technological tools are at the teacher's disposal.

Regarding the teachers' pedagogic approach, two sub-themes are inextricably linked to this theme, namely learner interaction and participation, teacher-dominated lessons. It is the teacher's pedagogic approach that determines how learners are involved in the lesson. This will happen by way of the activities that are either embedded in the teacher's planning, or arise during the interaction facilitated by the teacher during the lesson.

In all the lessons that the researcher observed, learner participation and interaction was almost non-existent. To the extent that the teachers were doing all the talking and the explaining for the most part of the lessons, the approach was teacher-centric.

In a language class a teacher-dominated lesson will do the learners no good. Even in the absence of technology, innovation and creativity assist teachers in the planning of lessons with learners in mind. The two lessons, one on an advertisement, and the other on analysing a cartoon, had the potential to be learner-centred. First, by virtue of the basic ICT tools that were available in the classroom at the school (S5-E), and second, the nature of these topics which renders them task- or project-based for learners.

Even though the pedagogic approach a teacher chooses in a lesson can be influenced by the technology that is available, the choice of what to teach and how to teach it rests with the teacher. For this reason, the use of ICT or the lack thereof should not be reason for any teacher to subject learners to a poorly planned lesson.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will present a summary of the study, including a synopsis of the salient points of chapters 1-3. It will reiterate the research questions and explain how the study contributed to the body of knowledge. Through the research questions stated in chapter 1, which were supported by TPACK and constructivist theoretical foundations, the study aimed to determine the factors that impact ICT integration in 8th and 9th grades of the senior phase in secondary schools. The data gathered in chapter 3 will illustrate how the data analysis approach in chapter 4 relates to responding to the research questions. The remainder of the chapter will give a summary of the findings, conclusions, recommendations for future research, and finally the implications for the study.

The current technological era of digital mobility and interactions challenges individuals and communities around the world to adapt rapidly to keep with pace of innovation and digitalization. In the hastily evolving era of technology the education sector cannot remain isolated. The use of technology in education has been a field of interest, and continues to receive attention from researchers and scholars worldwide. In South Africa, the department of basic education In South Africa (SA), the Department of Basic Education (DBE) has also introduced digital technologies to improve instruction in schools (Graham, Stols & Kapp, 2020:749). Partnerships have also been formed with several extra-governmental bodies with interest in education to enhance the quality of teaching and learning in South African public schools. Such partnerships and efforts have largely succeeded in other countries where they were introduced, like China (Zeng, 2022:1063), Australia and Finland (Kian, 2019:383). These countries have arguably the most advanced ICT integration programmes in education. In South Africa, the contribution made by these interventions is yet to be seen, as policy does not meet practice.

5.2 SUMMARY OF THE STUDY

This dissertation was written in the form of articles. Methodology, data analysis and results have been worked into each of the articles. The chapters are arranged as follows: chapter 1, chapter 2, article 1, article 2, chapter 5.

Chapter 1 described the conceptual basis of the study, outlining what was to be investigated and providing the research context. The study explored the factors that impacted the pedagogical integration of ICT in English second language (EL2), with TPACK and constructivism as the theoretical foundations. The research problem, along which the purpose of the study was described to put it in the right context. What the research problem stated was that many EL2 teachers in SA were not integrating ICT in their instruction, despite being aware of its advantages. Chapter 2 provided a review of the literature, which was meant to place the research focus into context. The chapter outlined the research design. Being a qualitative study, a phenomenological design was adopted, using interviews and observations as the main data collection procedures. Chapter 3, which is article 1, and chapter 4, which is article 2, elaborated on the research methodology, and how the data was collected using the relevant data collection instruments. Data analysis was included in both articles 1 and 2. The sampling and selection criteria for the participants, who in this case comprised 8th and 9th grade EL2 teachers and learners, were outlined in chapter 3. So was thematic analysis and interpretation of data. The last chapter of the study, chapter 5, will provide a comprehensive summary of the study. It will also present a summary of the findings, conclusions and recommendations for future studies.

5.3 SUMMARY OF FINDINGS AND CONCLUSION

The use of technology in education has been a field of academic interest, and continues to receive attention from researchers and scholars worldwide. In South Africa, the Department of Basic Education (DBE) formulated policies and introduced digital technologies to enhance instruction in schools (Graham, Stols & Kapp, 2020:749). Several partnerships have also been established between the DBE and other organisations to advance ICT-in-education programmes in public schools. There are, for example, the Vodacom e-School (Joosub, 2023:3), Microsoft digital skills training (DBE, 2021), MTN Foundation's MTN Online School, and the Vodacom Foundation's Virtual Classroom. However, evidence suggests that teachers are not

integrating ICT in their instruction as expected, despite their being aware of its benefits to themselves and to their learners.

The data generated from the interviews, observations, and focus group discussions revealed teachers' and learners' perceptions about ICT integration, the advantages associated with integrating ICT, the challenges they face about resources and infrastructure, and the need for support, training and development in integrating ICT in teaching and learning.

5.3.1 Attitudes, skills and knowledge

Consonant with the view expressed by Chisango et al. (2020:2), adopting a constructivist pedagogic approach provides for learning conditions that promote learner-centred pedagogy, and accommodates a facilitator role of the teacher in delivering technology-enhanced EL2 lessons.

Positive teacher beliefs and attitudes make powerful determinants, which foster ICT integration in the classroom. All the teachers that were interviewed in this study believed that they could integrate ICT in their lessons. Despite their innate confidence, practical application of their technological knowledge and self-confidence did not match. TPACK requires of teachers the capability to combine technology, pedagogy and content knowledge to design appropriate lessons. That teachers have a positive attitude, know about and/or use technology, is not enough. It is knowing how to use ICT to teach and using it that matter.

Data from teachers' interview responses pointed to technology use in the classroom. The teachers' account revealed that technology use was limited to PowerPoint and video presentations. Although the lesson observations for the study were limited to one session per teacher per school, none of the participating teachers' enacted practices supported their purported technological knowledge. During the lesson observations, no ICT integration happened. No digital tools were used. No learning interactions took place involving learners with technology. Contextually, as advanced by Mishra (2019:2), it might be argued that the absence of technology tools and infrastructure could be a contributory factor. Nevertheless, regardless of some technology tools being at their disposal in two of the classrooms at the other schools that participated in the study, the two teachers did not use the basic, available ICT tools.

At closer analysis, one possible scenario might be lack of appropriate knowledge of how to use the technology. This denoted there was no shift towards a constructivist teaching approach.

5.3.2 Digital resources used

The absence of ICT resources in the classrooms appeared as one of the contextual barriers to incorporating technology in EL2 instruction. Classroom lesson observations revealed that, out the five schools that were sampled, 2 had a projector and a white installed (table 5.1).

Table 5. 1: Digital media in EL2 classrooms per school

School	Digital media present in the EL2 classroom	Digital media used by learners during the lesson	Digital media not used by learners during the lesson
1	None	None	X
2	Data projector	None	X
3	None	None	X
4	None	None	X
5	Data projector	None	X

The learners' focus group discussions had revealed that no digital tools were used in their EL2 lessons. Limited access regarding the number of places where learners and teachers can connect to, means that both are constrained in terms of where online resources and applications can be accessed. The risk associated with failure to provide adequate resources suggests that the want of support demotivates even the teacher most enthusiastic about integrating ICT. This situation could well explain the absence of language learning activities described by Gul (2016) in the section under constructivism from teacher-lesson observations. With little or no incentive to integrate ICT, conditions for constructivist-based-instruction dissipate, and teachers continue to teach in the traditional way. Despite their supposed technological knowledge, teachers are unable to use technology to conduct constructivist-based lessons.

5.3.3 Context

Theoretical underpinnings of both constructivism and 21st-century pedagogy, support constructivist learning and the technological integration of digital technologies in English language instruction.

Lesson observations conducted during English L2 lessons revealed the absence of ICT integration in the English L2 classrooms. Availability of ICT resources at school, or even the lack thereof, is a contextual factor that impacts both teachers' and learners' access to digital tools. The reality is, without technological resources, there will be no enabling technologies to promote 21st-century learning and the development of higher cognitive skills inside the EL2 classroom, as espoused by Seitz and Hill (2021:2234), Tican and Deniz (2019:183) and Çengel et al. (2018:875). Meanwhile, teachers' inability to integrate 21st-century competencies in their instruction, because of lack of ICT resources, also means that opportunities for learners to engage with any amount of technology-mediated learning are compromised.

Learners were prohibited from using or bringing cell phones to school. The rigid "no cell phone" policy practised by the schools also meant that no other devices, such as tablets were permitted for learners. Added to teachers' poor technological knowledge and its consequences for 21st-century learning as aforesaid, this rigidity implies few teachers are encouraged to leverage making a shift towards a constructivist, technology-based pedagogic approach. Many learners have cell phones and other mobile devices. Considering the pervasive nature of these digital tools and their value to mobile learning, as enunciated by Chang and Hung (2019:13), schools could consider a more flexible attitude towards their use for educational purposes. Perhaps a change to "Bring Your Own Device" (BYOD) approach, supported by school-based policy and pedagogical guidelines, could go a long way in mitigating the shortage of ICT tools faced by schools.

Furthermore, as suggested by Charles and Pecorari (2016:85), the use of multimedia resources and mobile devices in language learning, promotes reflective and autonomous learning. Charles and Pecorari (2016) further maintain that using ICTs and Web 2.0 tools, described earlier by Rwodzi, De Jager & Mpofu (2020:4) and Bozkurt and Ataizi (2015:158), has a positive impact on whether learners can collaborate, upload their work and share it with others. These assertions substantiate

what learners stated in the preceding section regarding what kind of digital devices they owned and how they used them.

5.3.4 Learner autonomy and collaboration

Vygotsky's social constructivist approach to learning advocated learner autonomy and collaboration. These are among the most cited advantages related to pedagogic use of technology in EL2 instruction. Learner autonomy encourages learners to work independently from the teacher. They manage and channel their actions to achieve learning goals. Collaboration results from students working cooperatively on tasks, while socially interacting, reflecting, and incorporating prior experience in the meaning-making process (Roblyer & Hughes, 2019:44). Constructivist learning and use of technology in English L2 learning helps create ideal conditions where learners can work autonomously and collaborate with others (Tomljenović & Vorkapić, 2020:17).

It is therefore a significant finding that during the focus group discussions, learners were conscious of the fact that the English L2 lessons were conducted using textbooks and the chalkboard. There was no technology incorporated into the lessons, nor opportunities created for learners to use it. Lack of technology integration meant learners missed on the opportunity to engage in digital learning. The teacher talked for the better part of the lesson while learners sat passively, unable to engage in interactive learning activities. Lack of technology should not be the reason for the teacher-centred lesson. The teacher's lesson planning should incorporate what learners are going to do, how they are going to do it, and what the expected outcomes are regarding the planned activities' contribution to their language enrichment.

Overall, what this equates to is learners who are let down by pedagogic practices that are meant to improve their language learning and communication skills (Çengel et al., 2018:875). Sikhakhane, Govender and Maphalala (2020:705) caution that such an approach defeated meaningful learner attainment by its failure to make a significant contribution to their intellectual achievement.

5.4 CONCLUSION

The teachers *believed* that if they had access to technology and used it in their instruction, learners would benefit from a more rewarding, participatory learning experience. Their view resonated with that of Chang and Hung (2019:12) that, by using ICT in L2 classrooms greatly improves learners' academic performance.

Some teachers had access to some forms of technology, including laptops and data projectors, despite not using them. They were also aware to the advantages of assimilating digital tools into their pedagogic practices. While their failure to incorporate technology did not necessarily mean that the teachers did not embrace ICT integration, reasons for not doing so with what was available could not be established by this study. Previous studies have demonstrated that teachers generally have a positive attitude and perceptions about integrating ICT in their instruction. In addition, correlation has been drawn between positive attitudes among teachers and the use of ICT.

Lack of ICT resources and poor infrastructure, the need for teacher training and development in ICT integration, were revealed as the main barriers in integrating ICT. These factors have already been reported on in several previous studies. Even the meagre ICT tools that were available were not used. Therefore, as findings, they did have much significance in advancing the scientific knowledge as it was expected. One teacher explained how lack of access to the school *Wi-Fi* rendered a monitor in his class redundant, and that he could not buy data from his pocket. By his own admission, notwithstanding, he used WhatsApp to share content-related data with his learners, as well as task-related information beyond school hours.

Teachers revealed their need for more development in the integration of ICT. From this disclosure, the researcher can draw a link between lack of confidence and not using ICT. The researcher maintains that however confident the teachers purport to be, or their level of technological knowledge reportedly is, these are not sufficient to integrate ICT into teaching. Adhikari (2021:117), Katemba (2020:46), and Mwapele et al. (2019:16), argue that poor uptake of digital tools in EL2 pedagogy is often a consequence of inadequate teacher professional development and training. In addition to resources, teachers need training, opportunities for planning and collaboration, and support in developing 21st-century teaching strategies.

One discovery from all the lesson observations was the absence of learner involvement in the lesson. Viewed from a constructivist paradigm, the teachers presented lessons from which the learners were practically actively excluded, since they were the ones who did much of the talking. When English lesson are presented in the manner described, then the aptness of these teachers' pedagogic approach is open to question.

Following a phenomenological design, the study explored the teachers' and learners' perceptions on integrating ICT in EL2 classrooms. The researcher further examined the occurrence of ICT resources in the EL2 classrooms. and how 8th and 9th grade teachers and learners used them during their English lessons.

This research established how ICT was integrated in 8th and 9th grade EL2 pedagogy in the sampled schools, and the barriers preventing 8th and 9th grade teachers and learners from using ICT in EL2 instruction.

It is suggested that further research be conducted on how a technologically integrated EL2 curriculum in the senior phase can be developed in the South African context. In addition, more township schools in other quintiles could be included to widen the scope of the research. The research should take into consideration the teachers' role in developing and implementing ICT-based curriculum. Contextual needs of poor quintile 2 and 3 schools should also be considered.

5.5 IMPLICATIONS

The following are the types of implications for this study: theoretical, practical and future implications.

5.5.1 Theoretical implications

The theoretical implications of this study are that the depth of the data generated from the interviews, focus group discussions and observations was not profound to reveal new insights into the phenomenon under investigation. The methodology itself is not under question. The researcher believes that more interviews and lesson observations could have assisted reveal more data beyond what is already in the realm of current knowledge.

5.5.2 Practical implications

Despite the researcher appreciating that new insights were not adequately revealed from the results of this study, the study has confirmed the existence of some challenges that continue to plague the pedagogic environment in our classrooms. Below, the researcher suggests how the results of the study can be applied in professional practice.

Teacher training, development, and support

- Education districts and teacher supervisors should monitor teaching and learning at schools, and support teachers in applying appropriate methods and approaches during teaching.
- The DBE should introduce a SAQA accredited, compulsory TPACK-based integration course for in-service EL2 teachers.
- Districts should support their schools in implementing ICT policies that are geared towards improving teaching and learning in schools. This includes embracing the educational value of mobile technologies that learners already possess.

Textbooks

- The researcher suggests that the current senior phase EL2 textbooks be accompanied by digital copies of interactive language-learning activities and teachers' guides on methodology.
- Another consideration is that EL2 textbooks be digitalised, with guidance for teachers and learners on interactive language-learning activities, and teaching plans that incorporate appropriate pedagogic approaches for specific topics.

Digital literacy

- The DBE should consider introducing digital literacy as a school subject from earlier grades to equip learners with the requisite competencies.

5.5.3 Future implications

Future implications for the study are that, while the researcher deems the methodology to have been appropriate for the study, the study did not determine why the teachers in the study did not employ a social constructivist approach in their lessons, and instead chose a teacher-centred approach. More interviews and lesson observations could reveal deeper data on this teacher phenomenon.

5.6 LIMITATIONS OF THE STUDY

The following limitations were present in the study:

The following limitations were present in the study:

- The study group was limited only to 8th and 9th grade EL2 teachers within the Maokeng area. The researcher has also taught in these grades. These grades are part of the senior phase where there is paucity of research in this field.
- The schools were in quintiles 2 or 3. Both quintiles represented poor public schools, with 2 being poorer than 3. Due to their socio-economic status, these schools would benefit more from any forms of intervention than would schools in quintiles 4 and 5.
- Constraints of time limited the time for data collection. Access to the participants depended on their availability only at the given times. More lesson observations and interviews could have contributed to the richness of the data generated.
- The teacher population sample was limited only to 5. This limited the scope of the data collected as a bigger sample would have increased the scope.
- The data gathered were triangulated through semi-structured interviews, lesson observations and field notes to enhance the quality.

5.7 RECOMMENDATIONS

Following the discussions in the preceding sections, this section presents recommendations for future research. The researcher recommends that:

- the teacher sample population be increased to broaden the scope of the research.
- further research be conducted on how EL2 teachers integrate ICT in their instruction. This study could not determine this because there were no ICT tools in the classrooms of the sampled schools. As a result, ICT integration could not be done.
- further research be conducted on why teachers would not integrate ICT in their instruction, despite their awareness of its benefits. In this study, there were no ICT resources available in the classrooms to make a connection between ICT and the teachers' reasons.
- It is suggested that further research be conducted on how a technologically integrated EL2 curriculum in the senior phase can be developed in the South African context. In addition, more public schools in other quintiles could be included to widen the scope of the research. The research should take into consideration the teachers' role in developing and implementing ICT-based

curriculum. Contextual needs of poor quintile 2 and 3 schools should also be considered.

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APPENDICES

APPENDIX 1: TEACHERS' INTERVIEW SCHEME

Name of candidate	Khaile, MP	Student No.	2018767257
Degree programme	MEd: Languages		
Research title	Exploring factors that impact ICT integration in Free State senior phase EL2 classrooms		
Data gathering method	Interview		
Target	Teachers		
Institution	UNIVERSITY OF THE FREE STATE		

Interviewee	A	B	C	D	E
School	1	2	3	4	5

Which grade/s are you currently teaching?

What is your age?

What is your teaching experience?

1. Can you say in your own words what you understand by integrating ICT into language teaching and learning?
2. What would you say are the main benefits of ICT integration in ELT today?
3. Are there any pedagogical digital tools which you consider to be good/bad? Kindly elaborate.
4. Do you believe there are other stakeholders in education with a role to play in your practice as an educator? Can you name these stakeholders and briefly explain their respective roles. How does each of their roles influence your practice as an educator?
5. Would you describe your own level of ICT skills or digital literacy as a factor impacting the integration of ICT into your teaching of English? In what way/s?
6. What is your opinion about ICT integration in EL2 teaching in general and more

specifically in your own teaching?

7. Is there any specific methodology and/or approach you follow to plan and conduct your lessons? Please elaborate.
8. For you as a teacher, what is the single most important aspect of digital literacy/pedagogy?
9. If you were to start using ICT, or use it more effectively in your English lessons, what would its use/s be?
10. As a teacher with five years (or more) of EL2 teaching, are you currently engaged in any form of personal or professional development? Is it related to ICT integration?
11. Would you consider using different digital media to encourage learner autonomy?
12. What do you think of your learners' level of digital literacy? Does it influence your choice of methodology and/or approach?
13. How do you think your learners find your own lessons now? Do you think they might have a different opinion if you were to integrate ICTs or use technology more effectively?
14. What do you think learners think about integrating ICTs in ELT?

In what ways would you like to be assisted to transform your own practice to integrate ICTs?

APPENDIX 2: LEARNERS' FOCUS GROUP DISCUSSION QUESTIONS

1. What digital personal devices do you have? Where, when and how do you use them?
2. What digital devices do you use in the English language class? How do you use them?
3. Do you think using technology during English lessons would make a difference in your learning English? What difference would it make?
4. From your point of view as an EL2 learner, do you think technology has a role it plays in learning English? Please elaborate.
5. What do you think your role is/ what role do you think you can play in seeing that technology (ICT) is integrated in an (more) effective way in learning English?
6. Are there any issues/situations that you believe are making it difficult to use technology in your English lessons? What are they?
7. As learners, if you were to make ICT changes in the manner learning English is happening now in your English class, what would the changes be?
8. What activities have you done in the English class using technology?

APPENDIX 9: LETTER FROM LANGUAGE EDITOR

APPENDIX 9: TURN IT IN REPORT