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CHAPTER 1

ORIENTATION

1.1 Background and orientation

Modern-day learners find themselves in a technological world. They learn, live, work, and play in a rapidly changing digital environment. They have cellphones that transmit text messages, photos, and voice, handheld “personal digital assistants”, small digital cameras, webcams and internet connections from any location served by wireless networks. Communication has evolved into e-mails, chatrooms, instant messaging, blogs and wikis. Furthermore, images, colour, animation and visual designs are readily available at the click of a mouse. Learners are surrounded by new choices of discourses, authorships, identity constructions, and learning communities that know no boundaries. These changes affect the ways learners learn and use languages. They also change the way teachers teach a language, as learners expect these technologies to be reflected in the classroom (Zhao, 2003).

Today, as predicted, the workforce needs people who can easily adapt and learn, who can apply their 21st-century knowledge and skills to provide solutions for complex services in a digital, competitive and democratic environment (Ghaith, 2010). The tertiary institutions in South Africa are technologically advanced and, owing to increased globalisation, the students find themselves in a digital world. Therefore, because schools need to prepare learners for tertiary institutions and for the digital workplace, it is no more a matter of what technology to use but how to use the relevant technology in the classroom. This study, then, needs to be contextualised in terms of two sociolinguistic realities.

Firstly, learners who grew up with technology are no longer passive receptacles of information. In this new digital era, Tapscott (2009) sees no place for the mass-produced information of traditional education and its distribution to all, maintaining that traditional education resulted in too many learners dropping out of high school and frustrated learners in need of real learning. The purpose of education today is to prepare learners to thrive in the digital environment. Knowledge is easily available on the internet; therefore the focus of teaching has shifted from the transmission of factual data to teaching learners how to learn. Accordingly, learners should be guided by facilitators, and given opportunities for collaboration and exploration in pursuit of

self-discovery. Technology should be used to individualise access and to make the best use of the learner's time.

Holland & Holland (2014) emphasise the importance of keeping track of the demands of the world in which we are living. In order to provide interactive efficient learning opportunities, teachers need to integrate technology meaningfully by selecting quality tools that are aligned to current best pedagogical practices. Digital tools are available for this purpose that allow learners to actively collaborate, do research, be innovate and share their ideas. Collaborative tools can increase knowledge acquisition while global connections can provide broader perspectives. In addition, because of the rapid change in technology, well-established technologies such as the personal computer and internet access are becoming the norm while relatively new technologies, such as smart phones and other mobile internet-accessible devices, are becoming increasingly available. To facilitate learning, teachers need to alter their teaching activities and utilise the available resources. Consequently, technological innovations can result in an increase in learners' interests and motivation, increased access to target language (TL) input, and opportunities for interaction and feedback. Golonka, Bowles, Frank, Richardson & Freynik (2014b) have identified a clear need for teachers to engage with technology. New opportunities are thus available to teachers for the delivery of content, for communicating with their learners and the wider world and for new ways of presenting and creating learning activities.

Secondly, technology opens doors for language learning because of the exposure to the target language and the opportunities it offers for interaction in the target language. Furthermore, it gives learners opportunities to write in the target language (Chapelle, 2009). According to Krashen (1982), the best way for learners to learn a new language is to provide them with comprehensible input in a relaxed situation with low anxiety and messages that they really want to convey or hear. Using technology, learners can be supplied with multiple forms of rich input and interaction. Technology also opens up opportunities for new and innovative ways of data collection. For the purpose of this study, I chose the following definition of "technology" by (Zhao, 2003: 8), that is, technology "encompasses a wide range of tools, artefacts, and practices, from multimedia computers to the internet, from videotapes to online chatrooms, from web pages to interactive audio conferencing".

Thirdly, it is also necessary to give a brief overview of the history of South Africa's sociolinguistic development in order to address the needs of learners in the Afrikaans FAL classroom. Accordingly, the following discussion gives the broad context of this study.

During the apartheid era, Afrikaans and English were the only two official languages. During this time Afrikaans was favoured as a result of the Afrikanerisation of South African society, with the intention of uplifting poor Afrikaners after the First World War. When the Nationalist Party came into power in 1948, Afrikaans gained momentum and there was a drive to promote Afrikaans and Afrikaans–English bilingualism (Kamwangamalu, 2000).

Subsequently, after the election in 1994, a multilingual language policy was adopted by the new government and the National Department of Education. In terms of section 3(4)(*m*) of the National Education Policy Act 27 of 1996, eleven languages (Sepedi, Sesotho, Setswana, siSwati, Tshivenda, Xitsonga, isiNdebele, isiXhosa, isiZulu, Afrikaans and English) were officially recognised by the *Language in Education Policy* (Department of Education, 1997). This policy aimed to promote the status of these African languages by implementing them in schools as the language of learning and teaching (LOLT). However, this implementation was hindered because English and Afrikaans remained the LOLT in most schools. In predominantly black schools, learners in Grades 0 to 3 use an African language as the medium of instruction and in Grade 4 they change to English. Afrikaans is not used because of its association with apartheid (Kamwangamalu, 2000). The following table provides an overview of the official languages of South Africa and the percentage of the population that speaks the language as the mother tongue.

Table 1.1: Official languages of South Africa

SOUTH AFRICAN LANGUAGES 2011		
Language	**Number of speakers**	**% of total**
Afrikaans	6 855 082	13.5
English	4 892 623	9.6
isiNdebele	1 090 223	2.1
isiXhosa	8 154 258	16
isiZulu	11 587 374	22.7
Sepedi	4 618 576	9.1
Sesotho	3 849 563	7.6
Setswana	4 067 248	8
Sign language	234 655	0.5
SiSwati	1 297 046	2.5
Tshivenda	1 209 388	2.4
Xitsonga	2 277 148	4.5
Other	828 258	1.6
TOTAL	50 961 443	100

Source: (Statistics South Africa, 2012)

According to the census conducted in 2011, most South Africans speak isiZulu. However, Kamwangamalu (2000) maintains that English was the only language that benefited from the policy in spite of the attempts to promote African languages. Sufficient evidence in the media, such as the amount of airtime spent on the different languages on television, the government and the administration shows that the promotion of the indigenous African languages has failed. He furthermore argued that the exclusive use of English in the top structures and the legacy of Bantu education play a role in the current shift from African languages to English, especially in the black communities. Brown (2006) concurs with this, stating that the battle of mother tongue versus English as medium of instruction still continues. It has been established that effective literacy acquisition and first additional language proficiency depend on well-developed first language proficiency (Akinnaso, 1993). Hence, the effects of the apartheid history are still evident in most disadvantaged schools, especially in the rural areas.

Having said that, the technological development in schools and tertiary institutions are not on par with the government's vision and strategic plan. Bharuthram & Kies (2013)

report that many South African students who enter the university in their first year do not cope with the technological demands. The universities and tertiary institutions in South Africa are generally technologically advanced, but many of their students come from poor environments and poor socioeconomic backgrounds, where the schools that they have attended lack computers and community libraries while some even lack basic facilities such as electricity, water, ablution blocks, desks and chairs. Furthermore, the quality of education that they received was very poor, with the result that the learners have low literacy levels and do not cope with the demands made by universities. Consequently, the need for technological skills to fill the gap and the need for educators to stay updated with the current technologies are emphasised. Mentz & Mentz (2003) thus confirms the need for learners and teachers to be trained in the use of information technology in South Africa.

Bovée, Voogt & Meelissen (2007) and Le Roux (2011) contradict the aforementioned authors, however, and see South Africa as a developed and economically stable country that must set the pace for the African continent. According to Bovée et al. (2007), surveys have shown that there has been a quality improvement in the integration of technology into schools since 1996. The computers available for teaching and learning increased from 8, 7% in 1996 to 12,3% in 2000 and 13% of South African schools use computers (Bovée et al., 2007). Le Roux (2011) believes that South Africa has the ability to close the digital divide in public schools because of its telecommunications infrastructure and its technical knowhow. South Africa has not, however, kept pace with the implementation of technologies in schools, despite the generous education budget and cost savings in terms of software and infrastructure.

The National Department of Education is responsible for education across South Africa. The Department has nine provincial education departments, each running their own educational affairs. In light of the South African education authorities' recognition of the value of integrating technology in schools in order to keep up with the demands of the digital world (Gudmundsdottir, 2010), progressive ICT policies have been launched by the Department of Education to introduce new technologies into schools (Department of Education, 2004). The intention was to equip learners with the necessary 21st-century skills in order to prepare them for the future and to reduce inequalities (Gudmundsdottir, 2010). Accordingly, politicians had a vision of a digitally literate nation and Mrs Naledi Pandor, Minister of Education at the time, stated in the e-education white paper (Department of Education, 2004: 6):

> We want to ensure that every school has access to a wide choice of diverse, high-quality communication services, which will benefit all learners and local communities. The services provided by the initiative will enhance lifelong learning and provide unlimited opportunities for personal growth and development to all.

In spite of various initiatives, such as the Western Cape initiative to computerise all public schools, some critical drawbacks were noted such as the way in which teachers and learners struggled with curriculum delivery and some schools did not use the computers successfully (Gudmundsdottir, 2010). Ford, Botra & Rerselman (2014) report that, although teachers in rural areas are willing to use technology in their teaching, they are under-qualified and unable to integrate technology successfully in teaching and learning based on good pedagogic principles. In cases where some form of training is provided, the focus of the training is on computer literacy and not on how to teach successfully with technology. The digital divide therefore still remains a cause of concern. There are other factors that have influenced the increase in the digital divide, with material access to computers and the internet not being the only factor. Keniston & Kumar (2004) mention dimensions such as the rich and the poor, educated and uneducated, developed and developing countries and English proficiency that influences the digital divide. Van Dijk (2006), on the other hand, mentions material access (access to computers and the internet), mental access (motivation, experience and computer anxiety), skills access (digital competence, support and user-friendliness) and usage access (utilisation and opportunities to use technology). Furthermore, Warschauer (2004) focuses on access to different resources, such as human, physical, digital and social resources.

In 2013 the national goal for education was for all school learners to be information and computer technology capable. However, this goal was not realised probably as a result of the digital divide, as explained earlier. The necessity of digital fluency in the 21st century is reflected in the the goals set by the National Department of Education; however the majority of the Africa's population remains digitally illiterate, as can be seen in Figure 1.1 below:

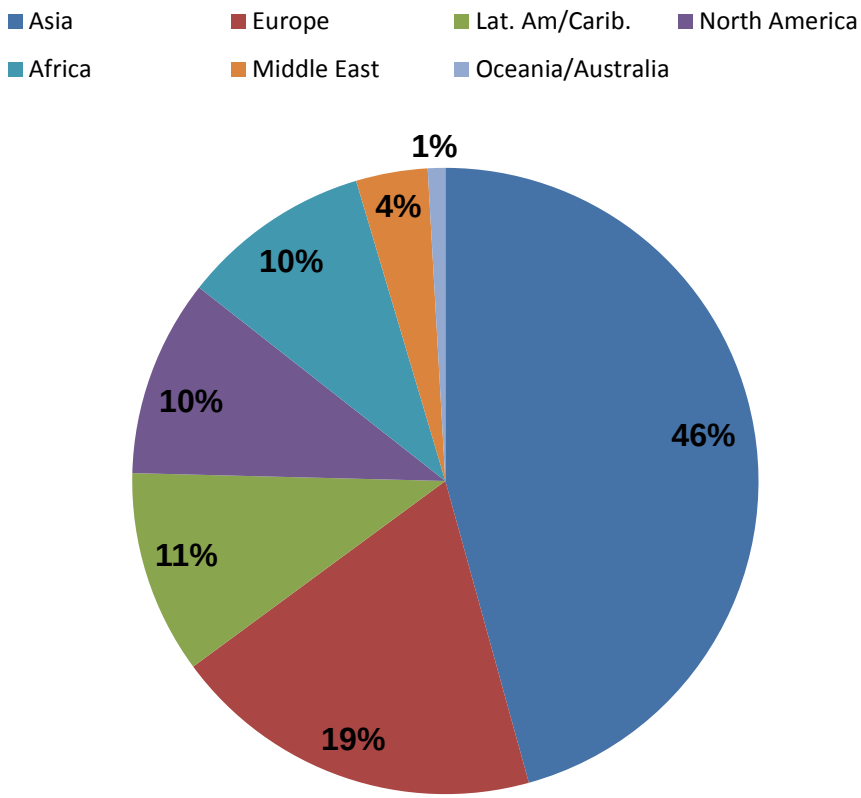

Figure 1.1: World internet usage statistics

Source: World Internet Usage Statistics News and Population Stats, 2014

According to the World Internet Usage Statistics News and Population Stats (2014), 26, 5% of Africa's population is using the internet. From 2000 to 2014, a mere 6% growth in internet usage was recorded. Africa accounts for only 9, 8% of total internet usage in comparison with the rest of the world. According to Barlow-Jones & van der Westhuizen (2011), tertiary institutions are faced with the challenge of enrolling students with uneven digital literacies. Learners that come from previously "advantaged" schools and private schools in South Africa have had computer training during their school careers and can be considered digitally literate. Moreover, they are able to keep up with the digital demands of the university (Barlow-Jones & van der Westhuizen, 2011).

1.2 Problem formulation and contextualisation

The effects of technology on language teaching and learning have been investigated for over 30 years, yet the literature still reveals a need for further investigation in terms of durable validated findings and a unified research agenda. Research on the use of

technology in language learning has experienced some problems such as poor choice of variables, poor description of the research design, untrained users of the technology and a lack of relevant data about participants. Moreover, the majority of studies are exclusively based on English and other Western European languages. This state of affairs presents a challenge in terms of investigating the efficacy of technology use in FAL (Golonka et al., 2014b).

Shinas (2013) highlights the new demands placed on teachers to learn to use and integrate new tools in their lessons because of the rapidly evolving technologies. The demands are intensified by computer-based assessments in schools. Teachers need to equip themselves with the necessary knowledge and skills to plan and teach pedagogically sound, technology-integrated, standards-based lessons in order to develop skilled 21st-century learners. Future research must be focused on the following constructs; namely, technological knowledge (TK), technological pedagogic knowledge (TPK) and technological pedagogical content knowledge (TPACK), in order to move distinctively from the general integration of technology to content-specific integration of technology. The focus of future research is not on “what” to teach with technology but rather on “how” to teach with technology.

Furthermore, Heitin (2011) argues that a gap exists between what happens in the real lives of learners outside school and what is happening inside the class. Learners seldom use handwritten reports outside school, so why are they still using them in class? Outside school learners use digital writing which includes audio, visual and text. In addition, digital writing skills are crucial for both tertiary education and the corporate world after school. Therefore, learners need to get exposure and experience in digital writing to match the real world out there.

Digital writing is becoming more and more collaborative. Chapelle (2006) advocates that schools gain back their prestige by incorporating the advances of new technologies. Learners are used to obtaining all they need and want at the click of a mouse; therefore teachers need to be aware of the different ways to transmit or record information. Nowadays learners are used to the quick distribution of information and expect quick feedback from teachers. Thus, teachers need to look at innovative ways of using technology that will fulfil the needs of learners. Zhang (2010) identified a great need for learners to employ technologies in their own learning. In this regard, Golonka et al. (2014b) suggest further studies on the effect of specific technologies on learners

with different proficiency levels in a diverse learning environment. In addition, Holland & Holland (2014) express a need for examining innovative and effective ways for individual learning.

All of the above point to the need to integrate technology into teaching and learning in this digital era and, more specifically, to employ specific technologies that address the individual needs of learners. Based on the literature and my perspective and experiences, the need for effective technology integration has been identified in order to ensure that learners are prepared for the challenges of tertiary institutions, the corporate world and the digital world that surrounds them. Accordingly, this warrants a study focusing explicitly on the way computer technology influences language learning in a multilinguistic class, on the relevance of the technologies used and on how they can be used to address the individual needs of learners to help them fulfil their potential. For this reason this study focuses on the effect of computer technology on FAL learning in a multilinguistic class.

1.3 Research questions

The primary research question that this study seeks to address is:

- How does computer technology (ICT) influence FAL teaching and learning in a multilinguistic class?

The following sub-questions flow from the primary question:

- How and in what ways can computer technology be made relevant for teaching and learning in a multilinguistic language class in the 21st century?
- How are FAL teaching and learning challenged when integrating computer technology in a multilinguistic class?
- How can computer technology be utilised to address every learner's individual learning need?

1.4 Purpose of the study

The purpose of this study is to explore the effect of computer technology on FAL learning in a multilinguistic class. This study also investigates how relevant technologies can be used to address the individual needs of learners.

1.5 Rationale and significance of the study

"Nomsa, are you busy on your phone while I'm teaching?" the teacher asked.

"But ma'am …," Nomsa replied.

Teacher: "You know it is against the rules to use your cell phone in class!"

"But ma'am, I am busy taking notes ..."

I experienced this incident during an FAL lesson and it sparked the curiosity in me to establish the effect of computer technology on language learning in a multilingual classroom.

1.5.1 The school

At the time of the study I was a high school teacher at a private school for girls. In 2005, the school management decided to integrate technology into the school curriculum in order to prepare learners for the digital environment both in tertiary institutions and the corporate world.

The initiative commenced by supplying all the teachers with laptops and providing them with training. In terms of the training, the school management decided on the International Computer Drivers Licence (ICDL) course, consisting of seven modules, which was made compulsory for all teachers and administrative employees. These modules included concepts of information technology, using the computer and managing files, word processing, creating, saving and closing a document, spreadsheets, databases, presentation and the internet. An examination was written at the end of each module and teachers had to pass all seven modules in order to obtain the ICDL certificate. As motivation, everyone who obtained the certificate was given a R300 voucher. In addition, only teachers that had an ICDL certificate were supplied with an interactive whiteboard, the *smart board,* for their classroom. Basic smart board training was also provided. Subsequently, a learning technologies facilitator was appointed to help the teachers with the smart boards and education software and with the smooth integration of technology into their lessons. This facilitator also helped with *Eduadmin,* a school management system for the administering the school and the learners.

It took teachers some time to become familiar with the technology and in the beginning electronic mail (e-mail) was not used. It was only later that the school management forced teachers to use e-mail as a communication tool. The school's information technology policy for teachers accordingly states that e-mails should be read by 12h00. Today it is the main communication tool used at the school. Although the school used to take care of all technology matters, today some functions are outsourced, such as the network administration, server upgrades and maintenance, cloud backups, wireless infrastructure upgrades and e-mail spam filtering. The following year, 2006, laptops were introduced to learners in Grade 9, with the rest of the school following suit in the years that followed.

Today, technology is second nature for all learners. All have a laptop and most classrooms have smart boards. The employees have free access to the internet and the library is adequately stocked with online references for use by teachers and learners. There is also an intranet and staff members communicate mainly via e-mail and short message service (sms) with the learners, parents and teachers. Some of the teachers have also created blogs for their subjects. An interactive website is used to market the school. The newest additions are the School Communicator (mainly for communication with parents), and Facebook and Twitter accounts, where the learners can socialise with other learners and also with alumni of the school.

1.5.2 The learners

In July 2002, when I started teaching Afrikaans FAL at the school, most of the learners had Afrikaans as their first additional language, while a few used the language at home to communicate with their families. Consequently, the teachers were faced with bored Afrikaans-speaking learners because the content for Afrikaans FAL is not challenging to them. In order to address this problem the school participated in Afrikaans Olympiads, Afrikaans Expositions and established an Afrikaans Club as an extramural activity to enrich and accommodate the learners who spoke Afrikaans at home. However, as a result of economic and political changes in South Africa, more and more learners from different countries were enrolled in the school while increasing numbers of parents were able to afford the high school fees because they had more opportunities now for better employment. Furthermore, because of increased globalisation with parents working overseas and also because of the demanding jobs of the parents in South Africa, parents enrolled their learners in the school because of

the boarding facilities. As a result, we are now faced with diverse learners with different levels of proficiency in Afrikaans. Nevertheless, all the learners have to achieve the same skills at the end of their Grade 12 year irrespective of their different levels of Afrikaans proficiency or their exposure to Afrikaans. Learners have to achieve at least 50% in a first additional language in Grade 12 for university entrance. The learners and the teachers at the school are fortunate to be surrounded with technology. I wanted to explore the effect of technology on learning in a multilingual language class to address the individual needs of the learners. The study focuses on one class of girl learners, from different backgrounds and different cultures and with Afrikaans as home language, first additional language, second additional language or even third additional language. The learners had not necessarily received tuition in Afrikaans as home language in pre-primary, primary or high school. They also did not, as is expected in the curriculum, have a solid foundation of Afrikaans FAL. They differ in respect of culture, race and the social circles in which they move and interact. Nevertheless, although the learners are worlds apart with regard to their knowledge of Afrikaans and are all individuals with their own unique approaches to learning, each of them, despite her own experience, must meet the required learning outcome and assessment criteria.

Learners have a choice between Afrikaans and Sepedi as a first additional language at the school. If learners start Grade 8 in South Africa they are accorded immigrant-status and are not compelled to do a first additional language to obtain their National Senior Certificate. However, one of the complicating factors is that a vast majority of the learners are not South Africans, with many coming from Botswana and choosing to do Afrikaans as a first additional language. There are also learners who have forgotten how to speak Afrikaans as a result of their having spent part of their high school careers overseas. As a result, there are many cases of learners taking Afrikaans for the first time as a subject in their Grade 8 year. They do not have the required vocabulary or foundation for the level of Afrikaans proficiency required in that grade and this proves frustrating for all parties concerned: the learners, parents and teachers. Teachers do not have either the time or the professional qualification to start with the foundation curriculum in order to teach a learner Grade 2 Afrikaans: how to read and write Afrikaans. There is also another factor which must be taken into account, namely, that there are Afrikaans-speaking learners who speak Afrikaans fluently as well as those learners who are fully bilingual because of the social circles in

which they move. They do not enjoy the Afrikaans class because it does not challenge them sufficiently. In addition, these Afrikaans-speaking learners are often extremely gifted and this exacerbates their boredom and they face no real challenges in class. In other words, the teacher is faced with a diverse class with different levels of Afrikaans proficiency which he or she needs to accommodate.

1.5.3 The parents

Parents enrol their children in private schools because they expect individual attention and high standards of education. Parents are disappointed when the grade average is high but their daughter, who takes Afrikaans as first additional language, scores low marks. The parents assume that the standard is high because there are Afrikaans-speaking learners in the class. As a result, the parents often withdraw their children from the school because their children are not performing to the parents' expectations. Teachers in private schools are under significant pressure from parents who want their children to perform while the management of private schools holds teachers accountable for the results in their subjects. The head of this school holds a standing meeting every year in September after the trial examination and in January after the external examination in December with every subject head in order to discuss the results of the learners. The learner enrolment at a private school also impacts on the income generated and this, in turn, affects salaries as well as employment. Accordingly, it is imperative to devise solutions for the problem of retaining learners in this competitive environment.

I, therefore, believe that this study may reveal solutions for the dilemmas facing schools that have similar contexts. I hope and believe that the outcome and recommendations of this study will motivate other teachers to use technology as a means to address the different levels in the Afrikaans FAL classes and also in other learning areas. I want to encourage other teachers to integrate technology in their lessons, to investigate new ways in which technology may be used in the classroom in order to help learners to take responsibility for their own learning and to connect with learners through technology because this is what excites the learners, and they want to engage with technology.

1.6 Literature study

There are three main objectives to the initial literature review which was conducted for the purposes of this research study: firstly, to examine the way in which traditional literacy has evolved into new literacies in the classrooms today, secondly, to investigate how a first additional language is mastered and, thirdly, to explore how computer technology (ICT) influences language learning in order to establish a theoretical sensitivity. This initial literature study is discussed in Chapter 2 in more depth.

1.6.1 Literacy

1.6.1.1 *Traditional literacy*

Historically, reading and writing the word was seen as a definition of literacy. In today's global, educational, ideological and societal institutions the ability to read and write is commonly accepted as literate behaviour (Parr & Campbell, 2012). According to Bawden (2001) "literacy" refers to the condition of being literate while "literate" refers to the ability to read and write. The term literacy comes from the Latin word *litteratus*, which is derived from *littera*, which means "letter". Parr & Campbell (2012) further refer to a literate person as a lettered person. In addition, Parr & Campbell (2012) also regard literacy as more than just reading and writing but as the way in which we communicate in society, our social practices and our relationships.

1.6.1.2 *Literacy as a social practice*

Gomez-Estern (2010) describes literacy as a psycho-cultural process in terms of which new reading and writing skills are acquired. A door to a literate culture is opened with such acquired culture tools. Reading and writing skills help a person to engage in social interactions and, thus, promote the socialisation process. It is, however, important to note that such skills do not improve a person's intelligence or cognitive capacity although the literacy process will change a person's relationship with his or her new socio-cultural and cognitive environment as the person masters new instruments.

Lankshear & Knobel (1998) confirm that literacy is a social practice with different contexts and based on the diverse needs of domains, individuals, tasks and societies. Street (2003) maintains that literacy is "about knowledge: the ways in which people

address reading and writing are themselves rooted in conceptions of knowledge, identity, and being" (Street 2003: 2). Parr & Campbell (2012) agree with Street (2003) when they assert that literacy is about knowledge, culture and language. Accordingly, literacy may be seen as a set of practices in a community. The meeting place for cultures is within a social network or a community while literacy skills are acquired within a community. The reading and writing skills develop out of the common uses and understandings of language (Ewing, 2003). Literacy can take on many more forms other than literacy on paper, for example, on the computer screen, on TV, on signs and on many more. This brings us to multiliteracies (Parr & Campbell, 2012).

1.6.1.3 *Multiliteracy for the 21st century*

Traditional literacy may no longer be enough for survival in this digital era because of the emerging technologies of the 21st century. Literary practices are changing because of the broad social, economic and technological changes in our everyday life, education, the media as well as the workplace. Accordingly, we need an expanded literacy to account for a culturally and linguistically diverse context and a society that is increasingly becoming more globalised. With globalisation, an increasing number of interrelated multifarious cultures and plurality of texts are emerging. More text forms such as visual images are rising because of information and multimedia technologies, and it is essential that people fully understand and competently engage with these multimodal texts. People need to equip themselves with these new literacies if they are to engage in meaningful communication in this new digital environment. Language and print literacy are no longer sufficient for the multimodal content that is utilised in order to communicate (Cope & Kalantzis, 2000). Literacy is a crucial skill for economic prosperity and even small improvements in national literacy levels may have a huge impact on the socio-economy (Carneiro & Gordon, 2013). Leu Jr. (2000) argues that work conditions have changed. The time of land, labour or capital is long gone and the effective use of information skills is vital in today's work environment. In the global competitive environment digital technologies provide instant access to a large amount of resources in order to solve problems effectively in a short amount of time. Carneiro & Gordon (2013) are of the opinion that literacy today requires life wide or lifelong learning individuals who are able to survive in an environment that is characterised by fast-moving technological innovations.

Another reason for lifelong learning individuals is the social media. The increased technological environment has brought about huge changes in the socialising aspect of society with the creation of social media. Learners are engaging more and more in written communication instead of oral communication as a result of social media and are constantly busy conveying messages, feelings and emotions via social media. Thus, the digital learners are using texts as their primary method of communication. Teachers and researchers are also eager to investigate the learning that takes place in online social settings. Mere access to social media is not enough and new media literacies are needed to fully engage in online settings. There is, thus, a gap between those who know how to fully engage in social media and those who do not. Therefore, it is vital for teachers to understand the literacies which are necessary for effective engagement in online settings.

These new literacies are referred to as “new media literacies”, “new literacies” or “digital literacies” (Kimmons, 2014). This confirms the notion of Carneiro & Gordon (2013) that new literacies are as essential as a driving licence in this high-tech, 21st-century society. Huffaker (2005) refers to this digital literate skill as being digital fluent. It refers to how comfortable an individual is with the use of computers. New literacies need to be considered in terms of the use of technology because the emergence of new technologies have changed the nature of literacy (Tapscott, 1998). Learners require the ability to read, comprehend and interact with technology in order to survive in the new media ecology (Coiro, 2003). In other words, literacy has evolved to include several new literacies such as visual, financial, health, social, digital, mathematics, functional and media literacies. According to a review conducted by Cervi, Paredes & Tornero (2010), literacy has evolved from reading and writing to electronic media to digital media and to a more comprehensive literacy that refers to both the internet and Web. 2.0. Hobbs, Felini & Cappello (2011) use the term “expanded literacy” in the new literacies to describe the focus that shifted from the alphabetic and written texts to a literacy that encompasses social communication and ideology.

Chen, Wu & Wang (2011a) argue that it is vital that individuals become new media “literate” in this new high tech, 21st century society. The authors also highlight the fact that most researchers see the new media literacy as *multiliteracies* (Carstens, 2012). The term “multiliteracies” was coined by the New London Group and focuses on the multiple communication channels that arose as a result of the increased linguistic and cultural diversity which has come about because of the digital technology world in

which we live (Cope & Kalantzis, 2000). Zammit (2011) agrees that we need to be multiliterate to be able to function fully in the digital society. In addition, Jewitt (2008) notes that the pedagogic aim of multiliteracies is to expose the learners to opportunities to engage with the wide range of literacy practices as well as the multiple and multimodal texts with which they are confronted on a daily basis. Multiliteracies promote individualised learning because they recognise the multiple ways in which learners make meaning. Furthermore, they encourage pedagogies that afford equal opportunities to both the traditional and non-traditional learners to learn in ways that enable them to participate fully in private, community, public and economic life (Newfield & Maungedzo, 2006). Being "multiliterate" also implies the ability to handle the social meanings and, consequently, the identities that each social setting evokes, the capacity to make meaning for different audiences, the ability to move between discourses and across genres and to apply the appropriate linguistic practice to each setting (Devereux & Wilson, 2008).

1.6.1.4 *Literacy in schools*

Computer technologies are not new in language and literacy education. Multimedia tools such as Word, PowerPoint, digital storytelling software and social networking Web 2.0 tools such as blogs, wikis, Twitter and Facebook are being used extensively in schools (Shin, 2013). Thus, mobility in the new digital era necessitates the acquisition of new academic and professional literacy practices and it is, therefore, essential that schools extend and enrich learners' *everyday* literacies (Devereux & Wilson, 2008) . Education technology should promote the traditional types of literacy as well as the new literacies. Blogs represent a perfect medium for both these types of literacy with the writers of blogs reading and writing as they would have done on paper, while increasing their skills with computers and the internet. In addition, blogs are suitable for all age groups and both genders because they are easy to use and provide a medium for learning programmatic skills (Huffaker, 2005).

Language practices through internet-related technologies have the potential to change the social relationships of learners and also to enable learners to facilitate new ways of sharing and creating knowledge. In addition, reading and writing in online settings may also enhance literacy development. The more learners engage in communication in the target language the more they will learn the correct sentence structure and expand their vocabularies (Shin, 2013). It is, therefore, vital that conceptualisations of

literacy are broadened to maximise the development of learners but, instead, they are being reduced to reading and writing because of standardised testing (Parr & Campbell, 2012).

One of the advantages of the new literacies is the large amount of information available and the fact that anyone may contribute to or create knowledge. However, this is also a limitation because people with strong religious, political, ideological or economic beliefs may use the internet to sway people. It is, therefore, crucial that learners learn critical skills to enable them to evaluate information. Skills such as information access, reading comprehension, communication and problem-solving, are essential to success in this new media ecology. These skills were previously lacking because it was assumed that text books and other traditional resources contained the correct information. Therefore, despite the barriers to technology integration such as a lack of preparation on the part of a teacher or the costs involved in such technology integration, it is clear that learners need to engage in technology to be prepared for the demands of the 21st century. The greatest advantage of the internet and other networked technologies is the easy and quick access they offer to the best information available to solve important problems (Leu Jr, 2002).

In addition, learners have more access to Web-based, electronic, and multimedia communication devices than ever before while also being able to connect very easily for access to information, communities or resources. The global expansion of technology has resulted in schools becoming increasingly diverse, and teachers need to provide multicultural, inclusive and multilingual contexts. New cultural practices are being formed and the interaction of multiple texts or voices is inevitable (Danzak, 2011). Greene, Yu & Copeland (2014) confirm that it is vital to acquire the skills required to use internet technology for 21st century learning with the internet playing a prominent role in both home and classroom lives. Another challenge is the ability to read critically the many presentations of information correctly such as images, multiple print, interactive simulations and videos. Greene et al. (2014) also highlight the challenge that learners face in search for and evaluating the correct information.

Carneiro & Gordon (2013) suggest that teachers need to provide the necessary flexible learning environments to support scaffolding. Kimmons (2014) advocates that teachers need to address the authentic identity problems that have arisen with the new social networking sites and new media literacies. Thus, it is incumbent on

teachers to help learners to develop authentic identities on social networking sites and to explain the fact that the learners' identities online are an extension of their own identities. Learners must be empowered to participate in meaningful and truthful social settings and they must not restrict their identities to the confines of the medium.

1.6.2 Mastering of a language

This section elaborates on the acquisition or learning of a FAL and also on previous research conducted on the integration of technology in FAL teaching and learning. The section will discuss the acquisition versus learning debate, the place of feedback in FAL teaching and learning and previous research on language learning with the use of technology.

Learning a second language (L2) and developing a pedagogy based on the literature on learning are both complex issues. It is possible to use either an objective quantitative study or a qualitative study when exploring the phenomenon of human knowledge in a social activity within the context of a case study and ethnography. Language acquisition is a developmental process and starts with concrete experiences and adult interaction. This foundation of a language is also referred to as the "early language". Harmon & Jones (2005) report that children begin to use recognisable words at the age of one and progress to two-word utterances that carry meaning at the age of two years.

The case study in this study involved Grade 11 learners in a first additional language classroom. In view of the fact that activity theory has transformed research in language, language learning and literacy, in particular, it may also provide solutions to some of the most profound problems experienced in both educational theorising and practice. In addition, this theory is helpful for analysing data that was recorded in real classrooms and in designing change when contradictions emerge in such cultural settings (Wolff-Michael & Yew-Yin, 2007).

Kaptelinin & Nardi (2009) define activity theory as a philosophical and cross-disciplinary framework that looks at the different forms of human practices as they develop in a social context. Kaptelinin & Nardi (2009) regard the human mind as the product of the interaction between people and artefacts in everyday life. According to Daniels (2010), Vygotsky focused on the way in which a human being functions when he or she is placed in a situation, with a problem and tools with which to solve the

problem. Maurino (2007) regards social relations between people as the mastery of cultural experiences, behaviour, habits, and methods of reasoning. The zone of proximal development may be defined as the distance between what the learner knows and what the learner could *potentially* know. In each zone there is a novice and an expert. Either the teacher as the expert or capable peers guide the learner through the learning process to enable the learner to reach his or her potential. Factors such as class size or wide ranges of ability levels may influence this zone (Maurino, 2007). Mills (2010) referred to Vygotsky's convincing argument that teachers should provide learning opportunities for collaboration with experts and powerful artefacts in order to bridge the distance between the learners' current levels of understanding and their potential levels.

Human action as an activity is the unit of analysis, situated in a context and participating in several activities simultaneously, with its own history while it is continuously changing and developing; it also involves various artefacts (Kaptelinin & Nardi, 2009). Artefacts refer to the instruments, signs, procedures, machines, methods, laws and forms of work organisation. According to Ryder (2006), an activity may be defined as the "engagement of a subject toward a certain goal or objective". Thus, an activity transforms an object into an outcome (Kaptelinin & Nardi, 2009). Daniels (2010) refers to language as a cultural product that can mediate thinking and feeling. By applying this tool of language, individual or psychological and cultural or historical processes come into play and co-create each other.

Connectivity

In terms of activity theory three mutual relationships exist between the subject, object and community with these relationships being mediated by the relevant tools. There are also a set of rules that constitutes correct behaviour in a situation (Kaptelinin & Nardi, 2009).

Mwanza's eight-step model is used to guide the analysis of an inquiry (Benson, Lawler & Whitworth, 2008:4):

- **Activity:** What sort of activity will take place in the study?
- **Object(ive):** Why is the activity taking place?
- **Subjects:** Who is responsible for this activity?
- **Tools:** How do the subjects carry out this activity?

- **Rules:** What are the relevant cultural norms, rules or regulations governing this activity?
- **Divisions of labour or roles:** Who is responsible for each activity?
- **Community:** In which environment is this activity taking place?
- **Outcome:** What is the goal of the activity?

In this case study, the researcher as the teacher is the subject, while the object is the Grade 11 learners and the learning of the learners. The mediational means include the textbooks, laptops, internet, emerging technologies, computer software and learning management system. The rules include the International Examination Board curriculum, school code of conduct, rules for the use of technology, classroom rules, timetables and social media policy. The community includes the learners, teachers, school administration and the parent-teacher association. Finally, the labour is distributed between the first additional language teachers, the technology teacher and the technicians (Karasavvidis, 2009).

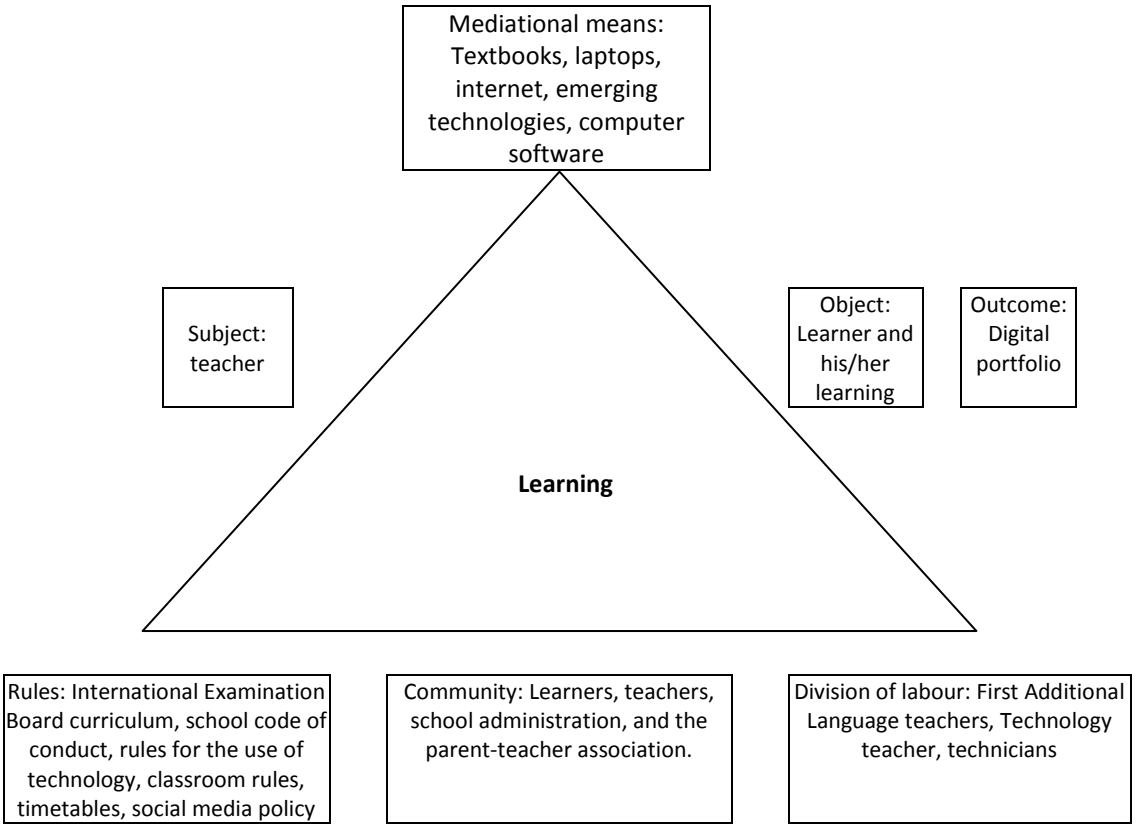

Figure 1.2: The activity triangle as applied to this study

1.6.3 The use of computer technology in the classroom

A short history of technology and language learning will be provided to give a brief overview of the way in which the use of technology in language learning has evolved: According to Warschauer & Meskill (2000), three decades ago people believed that the magic provided by technology was a solution to language learning. However, neither technology nor the audio-based language laboratory delivered the desired results. Accordingly, in order to study the use of technology in language learning today, it is important to investigate how technology developed in terms of language learning. Teachers who used the grammar-translation method relied on the black board with the black board comprising the vehicle for the one way transmission of information. The overhead projector was subsequently introduced into language classrooms, but this was also a vehicle for the one way transmission of information. Early computer software programs were also used for the "drill-and-practice" grammatical exercises. Universities in the 1970s and 1980 had compulsory sessions in the audio laboratories with students having to do the dreaded repetition drills. However, in view of the poor results despite the expensive language laboratories, the use of this audiolingual method diminished in the late 1970s. The focus on language form instead of communicative meaning was delivering poor results. It is only in the 1980s and 1990s that there was greater focus on communicative approaches in terms of which students engaged in authentic, meaningful interactions.

Xakaza (2007), Kafanabo (2006), Meyer (2005), Delport (2003) and Mihai (2007) all agree that the educational value of technology in the classroom is fundamental with learners taking responsibility for their learning. Thus, learning becomes learner-centred – is the cornerstone of outcomes-based education. The issues of discipline and learner motivation are addressed while the challenging environment created is conducive to deep learning and the acquisition of higher-order thinking skills. The teachers become facilitators and provide support and guidance. In addition, learners tend to put in more effort and creativity with technology than they would otherwise do. Mayayise (2008) reports that the learners engage in critical thinking and decision-making when they are interacting with other people on social media sites. He further states that social networking relaxes the participants and that they are having fun while communicating online. Xakaza (2007) highlights the value of interactivity and collaborative learning. Virtual learning environments also accommodate various learning styles and may be of benefit because they are available for 24 hours a day.

One of the most important aspects of online communication is that second language learners feel pressured to communicate face-to-face which is beneficial for language acquisition. Online blogging gives them the comfort of being in their own space while communicating while the virtual classroom may motivate the learners by both challenging them to communicate online and providing them the opportunity to take responsibility for their own learning. According to Mayayise (2008), girls prefer to engage in social activities such as chat rooms. This finding was applicable to this research study as the study was conducted in an all-girls school.

Van Niekerk (2007) used blogs in his study to do reflections in an e-learning environment. He argues that different types of learners act differently to a learning event. It is, thus, essential that facilitators take into consideration the type of learner and the level of Afrikaans as first additional language when facilitating learning in this context. Van Niekerk (2007) recommended that facilitators include podcasting and vodcasting in blogs. Felder, as quoted by Van Niekerk (2007), argues further that learners are unique and different and the facilitator must bear this in mind. Learners differ in how they prefer information to be presented to them. In addition, some learners are comfortable in groups while others like to work individually. Reflection may help learners in the learning process as they assess what they have learned and also those areas in which they still need some facilitation.

After investigating the affective experiences of learners in an online learning environment, Meyer (2005) concluded that the learners had realised they had common problems and they were not embarrassed to ask for help. Delport (2003) emphasises the importance of the teacher as facilitator and that the integration of technology will work only if both the teacher and learner are both knowledgeable about the technology in question and they are committed to its use. The teacher plays an important role in motivating learners to participate. Assignments or projects in terms of which learners will be assessed must be included and it must be part of their assessment mark. In addition, the assignments must be such that they encourage collaborative learning. If managed correctly these may accommodate the various learning styles of the learners while the learners will take responsibility for their own learning. Although Lumby (2007) conducted a similar study to this inquiry in an independent school, addressing the need investigate teaching towards outcomes and the effect of such teaching on assessment practices in a language literacy and communications classroom. However, Lumby (2007) did not investigate teaching

methodology and assessment. This research does not clarify the extent to which the assessment methodology influences the learning outcome. Although the curriculum and, therefore, assessment changed, it did not necessarily change the teaching methodology. Bolan (2010) used blogs as a data collection method and recommended the increased use of blogging techniques in the digital environment.

Blogging is a relevant data collection method in research study in a first additional language classroom. Mihai (2007) recommends blogging as a way of teaching because its educational value in that it shapes the learner's mind and encourages creativity. The current research focused on the use of blogging in order to promote integration between the learning areas. Mihai (2007) investigated how the learners handled the frustrations that arose with the use of technology. First additional language learners completed an assignment which was mark-orientated and they then had to hand in their work electronically. They were also required to provide their comments on their experiences electronically in a journal. The frustrations the learners experienced resulted in some learners looking for solutions while others revealed their frustrations in the form of aggression, regression, avoidance and confrontation.

1.6.4 Relevant technologies

Learners want to use technology to enrich their learning experience. They are constantly busy on their cell phones, iPads or tablets. It was found that teachers and learners require continuous access to the internet. Renzulli & Reis (2007) found that 185 000 students from 50 states in the United States of America who used the internet were frustrated because they did not have continuous access to the internet. Libraries have also taken on a more virtual form. Computer technology in the school context has also made the level of enrichment and curriculum differentiation possible. According to Kukulska-Hulme (2009), mobile-assisted language learning (MALL) or m-learning is attracting significant attention in the educational field, primarily as a result of the fast growth of mobile devices. People enjoy such mobility because it enables them to do what they want to do, wherever they want to want and when they want to. However, Godwin-Jones (2010) reported that there are a few empirical studies only that have investigated the effect of mobility on learners and their potential. Most of the studies related to MALL have focused on vocabulary-related research although some researchers have investigated language learning using various mobile devices such as mobile phones, Apple iPhones and pocket PCs. Researchers are embracing the

mobility and connectivity of mobile devices because of the potential for innovation in language learning for learners across different environments.

A necessary aspect of learning a language is the personal retention of words and expressions to improve communication. Today there are numerous electronic texts and software programs which enable the learning of new words. These texts and software programmes alternate with videos, audio-visual pictures, etc as well as being combined with online dictionaries and online support. In addition, several experiments have been conducted into computer assisted language learning (CALL), and various activities, comprehensions, texts and vocabulary activities have been created. Furthermore, the issue of a FAL is missing from the new model of the communicative learning of a language. Integrated sophisticated resources for the purposeful learning of vocabulary in an online setting is an important source in the long-term acquisition of a language (Godwin-Jones, 2010).

Lee, McLoughlin & Chan (2008) reported on “podcasting” as a technology that interests students. The term is derived from POD (personal on demand) and cast (broadcast). Podcasting is also known as social media and includes Facebook, Twitter, YouTube, personal blogs, etc. These social media may be accessed on mobile media players such as cellular phones, iPods, MP3 players and laptops. Many of these media players are forbidden in schools while some school districts have placed a ban on them. However, many schools have realised that such technologies are part of the learners’ world and have made lessons available through these technologies. Barret (2007) defines blogs as any webpage with its content organised according to date or in chronological order. A blog may make a digital portfolio interesting. Reflection on school work is possible because a blog is an online journal and also an environment that may encourage cooperation between learners. On the other hand, wikis are online documents that may be edited by anyone. This is especially useful for writing. The advantages of this type of technology include the fact that learners may access creative information swiftly and easily. Learners are also able to share with each other while teachers may also share with and assist each other. In addition, learners can spend countless hours learning without becoming bored (Lee et al., 2008). Lastly, the social media help to encourage collective intelligence and knowledge can be compiled collectively in this manner (O'Reilly, Rahinel, Foster & Patterson, 2007). Nobody feels ashamed to air his or her opinions. Learners are able to share their cultures, knowledge and opinions with each other with

the technology bringing together learners from across the world in one cyber classroom (Wade & Moje, 2001).

1.6.5 Conclusion

There is much information available on language acquisition. It is evident from the literature review that, when a new language is learnt, the emphasis should be put on acquisition and not learning (Li, 2009) while natural, meaningful settings are necessary in the acquisition of a new language (Harmon & Jones, 2005). A second language is not learned by direct instruction in the rules of language but by using the language in meaningful contexts and in natural communication situations (Mohan, Leung & Davison, 2001). Despite a growing body of research on the integration of technology in the classroom, the effect of computer technology on learning in a multilinguistic language class does not appear to have received attention in the literature. This gap in the literature points to the need for more research into specific, context-dependant, situated practices of learning with the use of technology and it is hoped that this study will make a valuable contribution in this field. In addition, innovative ways of data collection with the use of technology is another aspect of the digital environment that is attracting much attention. This literature study revealed the need for more research into online discussions. Online threaded discussion provides a valuable opportunity for the expansion of class discussions as well as an opportunity for collaborate learning beyond the classroom walls. In this digital age where mobility is the key word, online learning environments are a valuable tool for data collection because of the busy schedule of the majority of the participants in research studies. These data collection methods will be discussed in more depth in the chapter on research design and methodology.

1.7 Framework of the study

Creswell (2009) states that theory provides a lens that guides the researcher. The aim of this research study is to investigate the effect of technology on FAL learning in a multilingual classroom. Siko (2012) notes that the emphasis on education adapting to the 21st century is to ensure that the rapid changes in technology are addressed. He also stated that it is essential that education remains up to date and that it even competes with the digital world in which the current generation lives. Education must prepare productive members of society who are able to thrive in the digital era.

Technology has the potential to change the curriculum itself. Furthermore, it is incumbent on teachers to update their knowledge to enable them to select the appropriate technology for specific subject content. Thus, teachers need to know how to integrate the best technology for specific subject matter in order to realise the pedagogical goal of such subject matter.

1.7.1 Technological Pedagogical Content Knowledge (TPACK) framework

I considered the Technological Pedagogical Content Knowledge (TPACK) framework for the purpose of this study because this framework reflects the integration of technology, instruction, and subject matter as well as the connections between them. The TPCK framework was proposed by Mishra & Koehler (2006a) and provides a theoretical lens for teaching with technology. TPCK requires teachers to teach content-specific concepts with the aid of specific technology, applying strategies to support the teaching process and continuously assessing the efficiency of various technologies with regard to the best support for student learning (Koehler & Mishra, 2009). Flanagan & Shoffner (2013) maintain that teachers will benefit from implementing technological pedagogical content knowledge (TPACK) as this will enable them to connect the multiple literacies (or multiliteracies) to their instruction and to the learners in the classroom. Thus, implementing TPACK will allow them to develop a nuanced and critical understanding of the literacies and technologies that surround them in the language classrooms of the 21st century.

TPACK is a conceptual framework that guides researchers into a deeper understanding of the powerful and numerous roles that digital technology may play in both teaching and learning as TPACK focuses on the different relationships between the knowledge of content, pedagogy and technology (Robin, 2008). According to Koehler, Mishra, Kereluik, Shin & Graham (2014), the TPACK framework places effective technology integration into teaching and learning under the microscope while encompassing the knowledge that teachers require for the successful integration of technology. The TPACK framework has had a significant influence on research, theory, teacher professional development as well as practice in teacher education. The four domains that arise as a result of the intersection between content knowledge, technological knowledge and pedagogical knowledge include *technological content knowledge* (*TCK*), *pedagogical content knowledge* (*PCK*), *technological pedagogical knowledge* (*TPK)* and *technological pedagogical content knowledge (TPACK).*

Content knowledge (CK) refers to subject matter such as theories, teaching approaches, subject assessment guidelines and curriculum development while pedagogical knowledge (PK) refers to the pedagogy or the teaching process and includes teaching methods, assessments, classroom discipline, teaching approaches, learners' prior knowledge, enriching gifted learners, extra support for weaker learners, differentiation, educational purposes and aims, teaching strategies and lesson planning. On the other hand, technological knowledge (TK) refers to the use of emerging technologies including hardware and software. Young, Young & Shaker (2012) emphasise the importance of a sufficient knowledge of TCK to support the decision-making processes and the skills required in choosing appropriate technologies that support content. This will avert a situation in which teachers choose inappropriate technology that hinders, instead of enhancing, the teaching of specific content. This also applies to the technological pedagogical knowledge or TPK that provides teachers with a better understanding of the constraints and affordances of technology in respect of the teaching approach to specific subject matter than would otherwise have been the case. The TPK of teachers assists them with designing lessons and activities in terms of which technology is used to help with the acquisition of the content. Technology such as simulations supports learning. When such pedagogical activities are delivered via technology, the TPK assists teachers to facilitate activities successfully.

Mishra & Koehler (2008) regard the intersection of TPK, TCK, and PCK as the quintessence of TPACK, maintaining these types of knowledge are vitally important for successful teaching using technology. Mishra & Koehler (2007) list the different sets of knowledge and skills that TPACK encompasses as knowledge to understand the multiple representations of concepts using technologies, constructive pedagogical techniques to meet the individual needs of the learners; knowledge of specific content areas that learners find difficult to understand, how technology may be used to help with the learners' acquisition of concepts; knowledge of content and epistemological assumptions and knowledge of how to use technologies to scaffold learner content knowledge.

1.7.2 Adapted conceptual framework

Koehler & Mishra (2009) claim that effective integration of technology into teaching and learning can only be achieved if knowledge of technology, pedagogy and content

are simultaneously integrated. My framework adapts the TPACK to incorporate two other theoretical frameworks.

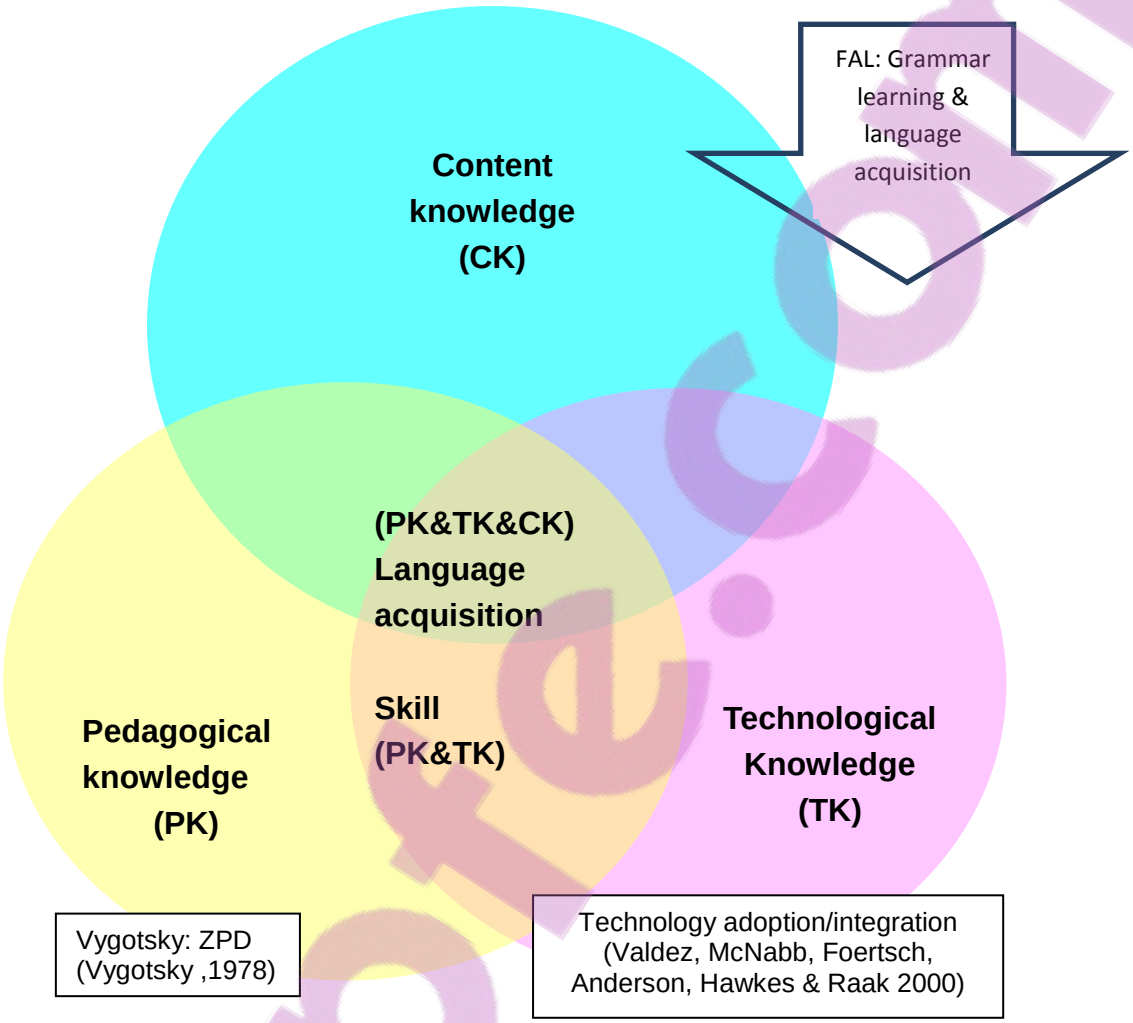

Figure 1.3: Adapted conceptual framework

My primary task is to teach and facilitate the acquisition of Afrikaans FAL. The framework that underpins language acquisition is the FAL content and the skills. The curriculum skills consist of learners communicating accurately and appropriately; using the additional language for academic learning across the curriculum; listening, speaking, writing and presenting with confidence and enjoyment; thinking independently and analytically; being able to express their experiences and findings orally and in writing; using the additional language to access and manage information across the curriculum, and becoming critical and creative thinkers (National Curriculum Statement Grade R–12, 2012). FAL constitutes the content in the form of grammar and language rules that learners have to master (CK).

The biggest challenge in my particular context is the great variation in language skills and attitudes in the learners as a result of the economic and political changes that

have taken place in South Africa. The learners have become more diverse, as they come from other countries as well as South Africa, and learners from previously disadvantaged groups are also being enrolled. In addition, the boarding facilities are in high demand because increasingly parents are working overseas or have demanding jobs that require long hours. As a result, we were faced with learners with different levels of Afrikaans proficiency.

In order to provide each learner with the best chance of success and to support each to surpass his/her own zone of proximal development, as suggested by Vygotsky (1978), the teacher should address learners' individual needs. According to Vygotsky (1978), the zone of proximal development is the distance between what the learner knows and what the learner could potentially know. Vygotsky (1978) focused on the way in which humans function when placed in a certain problem situation, with the tools to solve the problem. Vygotsky (1978) views learning as a social process within a certain context and thus social interaction is key to learning. By interacting with the teacher and capable peers, learners learn from one another in a social context and acquire knowledge and skills. Therefore teachers should provide powerful artefacts and learning opportunities for collaboration with experts in order to bridge the distance between learners' current levels of understanding and their potential levels. Vygotsky therefore informs the pedagogy needed to teach this subject in this context and represents the PK knowledge in Figure 1.3.

By providing individualised feedback to each individual learner, technology makes individual learning possible, but only if it is ubiquitous and is adopted by all role players. The third component of the framework is therefore technology (TK). Technology can be used to transform content in order for learners to have a better understanding of the subject matter (Mishra & Koehler, 2006). Teachers must therefore choose the correct technology based on pedagogical principles that can help the learner to grasp the content (Murray & Barnes, 1998, Levy, 1997). Technology is thus merely a teaching tool and, as such, must be used to integrate the learning and teaching methods with the available resources. Gordon, Halasz, Krawczyk, Leney, Michel, Pepper, Putkiewicz & Wiśniewski (2009) describe the "ideal" learning environment as an environment in which a more individualised approach is adopted that includes collaborative cross-curricular teaching and good leadership that builds on the vision of school development and encourages teamwork. The benefits of

technology integration far surpass the challenges, therefore, teachers need to look for solutions to overcome these challenges(Golonka et al., 2014b).

TPACK refers to the interaction of content knowledge (CK), technological knowledge (TK), and pedagogical knowledge (PK) and the transformation it brings when combining these three domains. For effective teaching, teachers need to have knowledge of these three domains and how to integrate them successfully. Four domains emerged from the intersection of content knowledge, technological knowledge and pedagogical knowledge, namely, *technological content knowledge* (*TCK*), *pedagogical content knowledge* (*PCK*), *technological pedagogical knowledge* (*TPK) and technological pedagogical content knowledge* (*TPACK*), as illustrated in Chapter 2 (Mishra & Koehler, 2006a).

Insufficient access to technology, and lack of time and technology skills are factors that prevent teachers from integrating technology in the classroom (Tondeur, van Braak, Sang, Voogt, Fisser & Ottenbreit-Leftwich, 2012). In addition, learners may become frustrated with software and hardware that does not work or has not been installed properly, distractions from the learning task and teachers ignoring the pedagogical purpose of the task (Golonka et al., 2014). According to Annetta (2010), there is generally not enough commitment from teachers and learners to integrate technology. Teachers therefore need to develop new tools and applications, using advanced technologies to enhance teaching and learning. Teachers with a good TPACK framework apply technology as an integrative part of the teaching process.

Krashen (1982) clearly distinguishes between language learning and language acquisition. Language acquisition occurs subconsciously in natural and meaningful interactions, while language learning is a conscious process of acquiring knowledge about the language, for example grammar rules. Language skill can be taught in the intersection between pedagogy and technology if technology is well used (TKPK). However, acquisition also requires a solid foundation of content in the form of grammar and language knowledge and rules. Part of acquisition is therefore situated at the intersection of all three knowledges, namely, TPACK.

This conceptual theoretical framework guides this inquiry and provides the lens for this investigation to direct and manage the complexity of the digital era.

1.8 Research design – Netnographic case study

In view of the fact that I observed the development and learning of one group of learners this research study may be regarded as a netnographic case study. Although the study was aimed at a group of learners, it was a case study because it involved one group of learners at one school. Stake (1995) best described a case study as creating a “picture” for others to see and experience the phenomenon being studied. Yin (2009) notes that researchers sometimes use the terms “case study”, “case study method” or “case method” interchangeably. The researcher may investigate any particular aspect in a case study, for example, activities, individuals, a specific phenomenon or groups. Case study research was deemed to be an appropriate method for the purposes of this study as it enabled both the development of an in-depth understanding of the experiences of teachers with technology and the observation of a phenomenon (technology integration) that would have been difficult to measure without observations and interviews (Creswell, 2007).

1.8.1 Worldview or paradigm

Creswell (2009) defines a “worldview” or “paradigm” as the nature of knowledge (epistemology) and reality (ontology) that the researcher holds and which is shaped by his or her discipline area, the beliefs of advisors and past research experiences. Creswell (2009) identified four different paradigms, namely, pragmatism, constructivism, advocacy/participatory and postposivitism. Orlikowski & Baroudi (1991) added the following three categories to Creswell’s list of paradigms, namely, positivist, interpretive and critical.

According to Nieuwenhuis (2010), an interpretivistic paradigm holds that reality is socially constructed and not objectively determined. Both constructivism and interpretivism support my experiences as both a teacher and facilitator, always providing opportunity for the learners to be active participants in the learning process and not merely passive recipients of information. As the Subject Head of Afrikaans and the Learning Area Head of Languages I had to look for solutions to help the learners who struggled with Afrikaans and to enrich the brighter learners. In view of the fact that I taught in an advanced technological school, where learners and teachers each have their own laptop and with internet access and interactive white boards in each classroom, I investigated ways of utilising technology to help the learners.

Cresswell (2009) is also of the opinion that the interpretive paradigm is based on a socio-constructivist theory. My study is, therefore, based on a constructivist-interpretive research paradigm. The teachers are facing more learners who are doing Afrikaans as a First Additional Language while they have no control over the learners' foundation in Afrikaans FAL than was previously the case. Thus, as indicated in the composition of the participants, teachers have to accommodate learners with different levels of Afrikaans.

1.9 Qualitative approach

Denzin & Lincoln (1994), the qualitative research design and method are descriptive, contextual, exploratory and theory-generating by nature. Thus, qualitative research is an explorative and in-depth description of a phenomenon in its natural circumstances (Merriam, 1988). Denzin & Lincoln (1998) are of the opinion that qualitative research is a result of the cultural anthropology that people observe in their own environments. For the purposes of this study, the environment refers to language, as the second-language classroom becomes the observation zone in which learners, through technology, learn Afrikaans.

1.9.1 Methodology

Both the technology available and the digital fluency of the participants influenced the choice of data collection instruments. The mobility of technology provided me with access to the participants even when the school was closed while the participants were also able to provide data whenever and wherever they were. This all saved time. According to Kozinets (2000), the method of netnography follows two important steps. Firstly, researchers must formulate specific research questions and also identify relevant online communities or forums that will provide answers to the research question. Secondly, they must obtain information on the community, group or individual in question and learn as much as they are able about them.

1.9.1.1 *Data collection*

Blogs

As mentioned in above, the researcher must familiarise him or herself with the characteristics of the group, community or individual in question before starting the data collection (Kozinets, 2000). Netnography is a participatory, observational

research method. The data may be collected in three ways, namely, (a) by the observer, (b) data generated through the recording and capturing of online events and interactions, and (c) data deduced by the observer (Kozinets, 2000). Netnographers acquire substantial amounts of data while the data is automatically transcribed. The choice of data depends on both the research question and the available resources (Kozinets, 2000). The posting of messages or comments in a blog is a social act and, thus, the data may be classified as either social or informational and either on-topic or off-topic. The posters, or the people who post, may also be categorised (Kozinets, 2000). For the purposes of this study the information or data was collected in the form of a blog – an online diary in which the learners recorded their observations of the use of technology in the FAL class (Dholakia & Zhang, 2004). In the blogs the learners had to reflect on their experiences in class whenever they had time available and, specifically, on their experiences in the technology integrated lessons.

E-portfolio

The learners are evaluated on their digital portfolios. Rick Stiggins, in Barrett (2005), defines a "portfolio" as a collection of a learner's work that demonstrates achievement or improvement. It is not a form of assessment but, rather, a communication tool to show a learner's growth and development. As an educational method portfolios were used in the United States of America in the 1980s as an alternative way in which to accredit teachers. According to Barrett (2005), an electronic portfolio is a portfolio in electronic format: videos, presentations, audio-visual formats, etc. A "digital portfolio" is defined as an alternative assessment method as compared to a traditional portfolio. Learners select their own evidence to display their improvement in learning. The digital portfolio also serves as a reflection of the learner in relation to his or her peer group – how he or she compares to his or her fellow learners. For the purposes of this study the learners completed their portfolio work digitally and they reflected in the blog on their learning experiences. Learners' progress and their interaction among each other and with the teacher will be monitored via the discussion board on the Internet.

Online interviews

The learners were also interviewed via e-mail. Online interviewing involves the exchange of facts. Asynchronous email communications has the advantage that the participants are given the opportunity to digest messages before replying to them. In view of the fact that I was both researcher (myself) and teacher, the learners felt more

comfortable having the time to think about the content before replying and then to answer at a time that suited their busy schedules. Email is also a good medium to use to discuss personal thoughts and feelings. Semi-structured interviews were conducted. This saved time because I had to conduct five interviews with each of the 19 participants.

Lesson observations

During lessons the learners were video recorded. As I was a participant observer, the videos were coded after the lessons. Five lessons were recorded: During the first lesson the learners were interacting in a chat room, during the second lesson they were busy blogging, during the third lesson they were interacting with the interactive white board while the fourth lesson was a poetry lesson with the aid of a Smart Response Simulator and, in the fifth lesson, Turnitin was used. Turnitin is a plagiarism detection tool that assesses a learner's own work and compares the assignment to a huge database of internet sources (Kunka, 2011). According to Heckler (2013), the goal of Turnitin is to educate learners about plagiarism, to acknowledge and praise other people's original work, to learn the correct citation and to inform the learners about the consequences of plagiarism. When assignments are submitted on Turnitin, the Originality Check on Turnitin compares the assignment to a huge database on the internet and provides an originality report. The video recordings were supported with comprehension field notes.

Focus group discussions

I conducted two focus group discussions with four FAL teachers teaching the same grade as I taught and the technician at the school. The second focus group discussion focused on the content of FAL. Teachers are extremely busy and this research study was not at the top of their priority lists. It is for this reason that the focus group discussion in the chat room was very convenient.

1.9.1.2 *Data analysis*

As the netnographer contextualised the online data, I used ATLAS.ti to analyse the data. Kozinets (2000) recommends that the analysis process should be evolutionary, focused on the research problem and proceed systematically, Furthermore, the interpretation level should be appropriate to the situation and the process should be

recorded. In this study the analysis and the inquiry happened simultaneously. Codes were used when the blogs, interviews, lesson observations, focus group discussions and digital portfolios were analysed online. The learners were numbered from participant 1 to participant 19. In line with the existing literature, the TPACK framework, activity theory and the experiences of the teacher were used to guide this inquiry and certain predictions were made.

The reflections of learners were posted on the blog. The learners used the blog to communicate with both the teacher and other learners and to reflect. Guidance and support were provided. The Turnitin software was used to promote reading and writing, to showcase excellent work on the part of the learners, and to promote the exchange ideas between the learners and the teachers. The blog provided an ideal platform for individual expressions and collaborative interactions in the form of dialogue. Themes emerged from the comments. Similar responses were grouped together as a category. Sub categories were generated using ATLAS.ti while Excel reports and graphs reflecting the progress of the learners were generated using ATLAS.ti. The final step in the data analysis process involved integrating the findings into a research report.

1.10 Ethical considerations

Despite the fact that technology provides quality language learning experiences, there are ethical concerns that need to be considered in the traditional language classroom (Wang & Heffernan, 2010). It is essential that teachers ensure that the privacy of the learners is protected on the internet, while any private information of the learners should be treated with confidentiality. Teachers should always be courteous and professional in the language learning classroom and respect the privacy of learners at all times (Wang & Heffernan, 2010). It is a standard requirement in the school that any request to conduct research must explain fully the main purpose of such research and also how the confidentiality of the research participants will be assured. In addition, it is also a standard requirement that the researcher states clearly that the findings will not be abused or used for any purpose other than the one it was intended for. I focused on the research questions and I did not interfere in any way that may have influenced the integrity of the data and the study as a whole. I communicated the aim, objectives, nature and future use of findings to the participants prior to the commencement of the data collection activities. I acknowledged that participation in

the study was voluntary and the informed (written) consent of the participants was a prerequisite.

After I had obtained the written permission of the principal and governors of the school to conduct the study, I sought the permission from the relevant parents and learners. I always acted in a sensitive and tactful manner. I use video recordings all the time and my learners became accustomed to being observed. The learners read the findings and results of the study before publication to obviate any discomfort or embarrassment on their part. The learners were debriefed after the recordings, the data collection on the blog and the data analysis to ensure their agreement and satisfaction with the process.

1.11 Trustworthiness

1.11.1 Reliability and trustworthiness

The posting of computer text is a communicative act. The content of such postings constitutes relevant observational data and may be considered trustworthy. Nevertheless, I took conventional precautions to ensure trustworthiness. The limitations of the medium and the technique used were disclosed in the conclusion to the study (Kozinets, 2000). The conversations in netnography occurred in written text form. These conversations are publicly available. I always analysed the content of the community's acts and not the acts of the individual (Kozinets, 2000). Netnography has the additional advantage that the researcher is able return to the original qualitative data set whenever needed during the data analysis phase (O'Reilly et al., 2007). The qualitative data was electronically saved and transcribed. The learners reviewed these transcriptions at the end of August 2014 for accuracy and they were given an opportunity to provide additional research data.

1.12 Chapter division

A synopsis of the organisation of the thesis is given in this section:

Chapter 1: Orientation

In this the first chapter I attempted to create a research space and situated the study within the inquiry fields of the effect of computer technology on learning in a multilinguistic language class.

Chapter 2: Literature study

This chapter addresses the existing literature and gives an explanation of the theories of new literacies, FAL acquisition and the integration of emerging technologies as well as discussing previous research. My framework adapts the conceptual theoretical framework, the Technological Pedagogical Content Knowledge (TPACK) framework, to incorporate Vygotsky's zone of proximal development. This adapted conceptual theoretical framework was employed as a lens with which to evaluate the efficacy of computer technology on learning in a multilinguistic language class.

Chapter 3: Research design and methodology

This chapter outlines the research approach and in particular the electronic way in which research has been applied in this study in an attempt to address the research questions. ATLAS.ti was used in this qualitative netnographic case study to transcribe and analyse the data from the discussions on the blog, interviews with learners via e-mail, classroom observations via video recordings and the netnographic focus group discussion in the chat room which was created for First Additional Language teachers.

Chapter 4: Data reporting and analysis

This chapter gives an analytical account of the data that were collected by four of the five data collection instruments and the themes that emerged.

Chapter 5: Turn the century with Turnitin

This chapter reports on and analyses the results of the fifth data collection instrument, the e-portfolios of the learners on Turnitin and the fifth theme.

Chapter 6: Overview, synthesis of findings, recommendations and conclusion

This last chapter sums up and brings together the existing literature and the empirical data collected. Possible further research endeavours are also presented.

1.13 SUMMARY

This chapter discussed the research problem and contextualised the study. This was made possible by a brief history of the sociolinguistic development of the South African education landscape, the discussion on the acquisition of a language, focusing specifically on the acquisition of a first additional language, the new literacies used by the digital learner as well previous research studies related to the integration of technology in language learning. A detailed overview of netnography was documented to motivate the choice of the approach. In addition, the adapted conceptual theoretical framework used was discussed as well as ethical considerations and trustworthiness.

The next chapter provides an historical overview of the integration of technology in language learning. In addition, the theoretical frameworks that were employed to frame the study are reviewed in more detail.

CHAPTER 2

LITERATURE STUDY

2.1 Introduction

Chapter 1 introduced the research problem and contextualised the problem under investigation. In addition, the chapter discussed the background to the study, previous research as well as the research design used. In addition, the chapter contained a motivation for the use of a combination of the Technological Pedagogical Content Knowledge (TPACK) and Vygotsky's theory to investigate the effect of computer technology on learning in a multilingual class.

This chapter investigates the effect of technology on learning in a multilingual classroom by examining the background to emerging technologies, teaching and learning in the 21st century as well as changes that are happening in both content and curriculum as a result of the changed technological environment. International and national studies conducted in the field are used to theorise this research study. An adapted conceptual framework is used to frame the investigation and direct and manage the complexity of the digital era.

2.2 Framework of the study

According to Vithal & Jansen (2004) a theoretical framework may be described as a well-developed, logical description of the phenomenon being studied and, as such, it provides direction and guides the study. It is aimed at making sense of both the empirical and the non-empirical data gathered. In addition, the framework explains the relationships between the various concepts and frames the study. It also provides a lens through which to look and examine the phenomenon under investigation and influences the way in which researchers look at and think about a topic. It also connects the study to the existing body of research (Neuman, 2005).

An adapted conceptual framework used in this inquiry incorporates two other theoretical frameworks: the technological pedagogical content knowledge (TPACK) framework and Vygotsky's theory. This adapted conceptual framework guides this inquiry and provides the lens for this investigation to direct and manage the complexity

of the digital era. I will now discuss the Technological pedagogical content knowledge (TPACK).

2.2.1 Technological pedagogical content knowledge (TPACK)

Technological pedagogical content knowledge (TPACK) is a conceptual theoretical framework. However, more case studies need to be performed to clarify complexity of this framework and its development (Graham, Burgoyne, Cantrell, Smith, St Clair & Harris, 2009). According to Cox & Graham (2009), more studies on TPACK will have a huge impact on the curricula of both pre-service and in-service teacher training.

The acronym TPCK is not new. Pierson (2001) first used the acronym to define the technology integration of teachers while other researchers used terms such as information and communication technology (ICT), related pedagogical content knowledge (PCK) (Valanides & Angeli, 2008) or technology-enhanced PCK (Niess, 2005). Mishra & Koehler (2006a) based their work on the well-known PCK of Shulman (1986), despite problems that had occurred with the initial framework. They added technology as a key component to the framework, thus creating technological pedagogical content knowledge (TPACK). TPACK formally emerged in 2003 in the Literature of Education Journal (Lundeberg, Bergland, Klyczek & Hoffman, 2003). The original consonant-heavy acronym of TPCK was changed to TPACK because of the ease of pronunciation of TPACK (Thompson & Mishra, 2007). Since 2005, TPACK has increasingly become a focus of research.

The TPACK framework is based on the understanding that teaching is a highly complex and dynamic environment in which there must be integration of the knowledge of technology, learner-thinking and learning as well as subject matter (Mishra & Koehler, 2006a). TPACK is situated and grounded in a specific context and does not exist in a vacuum (see Figure 2.1).

Cox and Graham (2009: 64) defined TPACK as “teacher’s knowledge of how to coordinate subject- or topic-specific activities with topic-specific representations, using emerging technologies to facilitate student learning”. On the other hand, Chai, Koh & Tsai (2013) describe TPACK as “the synthesized form of knowledge for the purpose of integrating ICT/educational technology into classroom teaching and learning”.

Mishra and Koehler (2006:1029) explain TPACK as:

> … the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones.

The above-mentioned researchers all agree that TPACK represents the interaction between content knowledge (CK), technological knowledge (TK), pedagogical knowledge (PK) and the transformation which is brought about when these three domains are combined. In order to teach effectively, teachers need to have a knowledge of these three domains and also how to integrate them successfully. Four domains arose out of the intersection of content knowledge, technological knowledge and pedagogical knowledge, namely, *technological content knowledge* (*TCK*), *pedagogical content knowledge* (*PCK*), *technological pedagogical knowledge* (*TPK) and technological pedagogical content knowledge* (*TPACK*) (see Figure 2.1) (Mishra & Koehler, 2006a).

2.2.1.1 *Content knowledge (CK)*

According to Koehler and Mishra (2009), content knowledge (CK) refers to the subject matter that the teacher teaches to the learners. It is, thus, essential that teachers know their subject matter. In addition, they need to know about the theories, teaching approaches, subject assessment guidelines, curriculum development etc. which are relevant to their subject. They also need to be constantly aware of the newest developments in their field. For the purposes of this study this component refers to knowledge of Afrikaans as a First Additional Language.

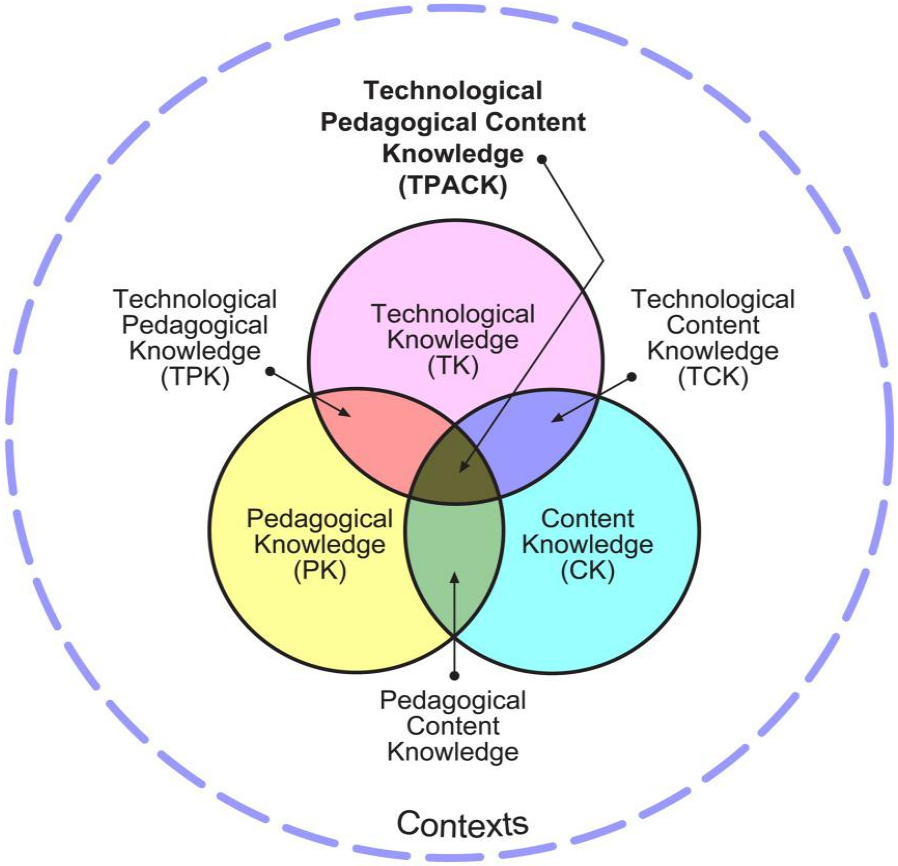

Figure 2.1: Framework of technological, pedagogical and content knowledge

Source: (Koehler & Mishra, 2009: 63)

2.2.1.2 *Pedagogical knowledge (PK)*

Pedagogical knowledge (PK) refers to the pedagogy or the teaching processes used by the teacher (Koehler & Mishra, 2009). It includes teaching methods, assessments, classroom discipline, teaching approaches, learners' prior knowledge, enriching gifted learners, extra support for weaker learners, differentiation, educational purposes and aims, teaching strategies, lesson planning etc. A teacher with sound pedagogical knowledge knows how learners learn and they are also acquainted with the cognitive, social and behavioural theories (Koehler & Mishra, 2009).

Cox & Graham (2009) refer to the general pedagogic activities as including the motivation for learners, communication with parents and learners, management of the classroom, discovery learning, co- operative learning and problem-based learning which may be used for any topic and which are not necessarily dependent on specific content. Thus, generalised pedagogic activities may be used across disciplines while helping teachers to draw from a pool of activities instead of designing an activity for every specific content (Cox & Graham, 2009). Morine-Dershimer & Kent (1999) agree

with Koehler & Mishra (2009) and Cox & Graham (2009) that any pedagogical activity will always include content because it is not possible to teach without any content.

2.2.1.3 *Technological knowledge (TK)*

According to Koehler & Mishra (2009) technological knowledge (TK), refers to the use of technologies such as the computers, laptops, iPads, cellular phones, blogs, wikis, Facebook and Twitter. In addition, technological knowledge (TK) includes hardware and software, both of which are changing constantly because technologies are changing continuously. The Committee of Information Technology Literacy of the National Council of Research (1999) proposed the Fluency of Information Technology (FITness). This encompasses a deeper knowledge of the computer technology that one uses productively in life and, by implication, at school. Thus, it refers to a deeper understanding of problem-solving, information processing and communication. Accordingly, the acquisition of TK will lead to more effective integration of technology than would otherwise have been the case. In addition, TK is also continuously developing (Koehler & Mishra, 2009).

2.2.1.4 *Pedagogical content knowledge (PCK)*

This component of the framework includes the combining or blending of content and pedagogy. According to Koehler & Mishra (2009), PCK was first referred to by Schulman in 1986. He argued that pedagogy and content are not separate or isolated components but are, instead, integrated entities. It is vital that teachers transform, adapt and align the subject matter in such a way that it is easy for learners to understand it. Thus, all the pedagogical principles are considered before the content is presented with pedagogy influencing the subject matter to be taught and vice versa. Thus, PCK refers to the way in which a teacher teaches the content without the use of technology (Koehler & Mishra, 2009). However, Koehler et al. (2014) maintain that the most important focus of PCK is to apply appropriate pedagogical strategies and skills in teaching and learning while taking into account the learners' prior knowledge, strengths and weaknesses together with an understanding of the content. This ensures the successful teaching of a particular subject matter. Technological content knowledge (TCK)

Koehler & Mishra (2009) define technological content knowledge (TCK) as the integration of content and technology without considering any pedagogical issues.

Technology plays an important role in manipulating content and may either support or constrain content. It is essential that teachers are aware of both the technologies which are suited to specific content matter as well as the content matter that may be integrated successfully with technology (Koehler & Mishra, 2009).

2.2.1.5 *Technological pedagogical knowledge (TPK)*

An example of TPK is knowledge of how to use interactive whiteboards for general pedagogical purposes (Cox & Graham, 2009). Koehler & Mishra (2009) would agree with this example because they view TPK as the influence of technology on both teaching and learning. They warn, however, that teachers need to be aware of the pedagogical constraints of specific technologies. It is, thus, incumbent on teachers to look beyond the fixed functionality of technologies and to ascertain their potential in educational settings. Most software is designed for the business world and it is, therefore, essential teachers are open-minded and that they explore the possibilities of the technologies in the world around them (Koehler & Mishra, 2009).

2.2.1.6 *Technological pedagogical content knowledge (TPACK)*

The effective integration of technology into teaching and learning may be achieved by means of a dynamic equilibrium between technology, pedagogy and content knowledge (Koehler & Mishra, 2009). Thus, teachers need to develop adaptibility and cognitive flexibility so as to enable them to construct effective technological solutions. It must be borne in mind that there is no single technological solution for effective teaching. Each situation is unique and, therefore, requires a unique combination of the three components of technology, pedagogy and content knowledge. Each teacher, each course and each view of teaching are unique. TPACK comes into play when knowledge of technology, pedagogy and content are simultaneously integrated. The TPACK framework helps the teacher to take into account technology, pedagogy and content to ensure effective technology integration. This implies that technology must not be regarded merely as an “add-on” but rather as an integrative aspect of the teaching process (Koehler & Mishra, 2009).

2.2.1.7 *Previous research on TPACK*

Recent studies on TPACK as a framework focused primarily on in-depth investigations of the development in TPACK of in-service and pre-service teachers (Graham et al., 2009, Schmidt, Baran, Thompson, Mishra, Koehler & Shin, 2009). Previous studies on

the use of TPACK as a framework in teaching subjects focused on the integration of technology in subjects such as Mathematics (Niess, 2005) and Science (Graham et al., 2009).

Angeli and Valanides (2009) proposed ICT-TPCK as a strand of TPACK because of the five components of ICT-TPCK, namely, ICT, content, pedagogy, learners and context. The study of Angeli and Valanides (2009) developed a combination of self, peer and expert assessment and investigated the ICT-TPCK competence of pre-service teachers in two design tasks. Lee & Tsai (2010) argue that the World Wide Web represents a specific case of technology. They measured the TPCK-W self-efficacy of 558 Taiwanese teachers. Schmidt et al. (2009) designed a survey for repeated use by pre-service teachers from their teacher preparation courses up to their teaching practice while Archambault & Crippen (2009) designed a reliable and valid survey to be used by in-service teachers with 600 K-12 online teachers responding to the survey. These measures opened the way for future development and investigation into various other content domains. Harris, Mishra & Koehler (2009) used an assessment rubric approach to evaluate a teacher's TPACK, arguing that the rubric instrument's results may be triangulated with data from the survey instrument. Niess (2005) is of the opinion that, with the increasing availability of technology in the classroom, TPACK encompasses all the knowledge that teachers require in today's teaching environment (Shinas, 2013).

Another interesting finding which emerged from studies on TPACK was that age, gender and experience all have an influence on the TPACK of teachers. Pierson (2001) found a correlation between the age and confidence of practising teachers with older teachers demonstrating less confidence in their implementation of ICT as compared to the younger generation. In addition, the more experienced teachers showed less confidence about their TPACK as compared to their less experienced counterparts (Lee & Tsai, 2010).

2.2.1.8 *Twenty-first century skills and TPACK*

Cramer (2007) lists the following skills as 21st century skills: digital-age literacy; visual and information literacies; basic scientific, economic and technological literacies; multicultural literacy; global awareness; adaptability; inventive thinking; risk-taking/higher-order thinking and sound reasoning; social and civic responsibility; managing complexity, curiosity, creativity; effective communication; teaming,

collaboration and interpersonal skills; interactive communication, prioritising, planning and managing for results; and the ability to produce relevant, high-quality products.

Binkley, Erstad, Herman, Raizen, Ripley, Miller-Ricci & Rumble (2012) reported that employers prefer employees who are able to think critically, analyse information, comprehend new ideas, communicate, collaborate in teams and solve problems. Another important prerequisite, regardless of occupation, is the digital fluency which is needed for effectiveness and efficiency at work.

Public organisations (European Union (EU), Organisation for Economic Co-operation and Development (OECD); United Nations Educational, Scientific, and Cultural Organization (UNESCO) as well as private organisations (Partnership for 21st Century Skills, Assessment and Teaching of 21st Century Skills) all agree that new, 21st century competencies are essential in today's digital environment.

Bruett (2006) is of the opinion that there is still a profound gap between the skills that learners acquire at school and the skills required in the workplace. It is essential that education rigorous and meaningful if it is produce learners with the competencies that are relevant to the 21st century workforce (Bruett, 2006). In this regard, Nelson, Christopher & Mims (2009) propose that Web 2.0 technologies may provide opportunities for collaborative learning and knowledge building. Murugesan (2007) describes Web 2.0 as a technological paradigm and a resource that includes many contemporary web technologies. Web 2.0 technologies use the web interactively and collaboratively while promoting the social interaction and collective intelligence of peers. Users are able to engage more effectively with Web 2.0 technologies. Wang, Huang, Jeng & Wang (2008) maintain that digital resources and web-based education change people's thoughts about teaching and learning. TPACK proficient teachers provide learners with the opportunity to create new ideas and knowledge while Web 2.0 technologies may be utilised by teachers to facilitate creative learning. Web 2.0 technologies include blogging, wikis, digital storytelling and social bookmarking. Such Web 2.0 technologies enable learners to generate and document activities, classroom content, experiences and reflections.

The integration of Web 2.0 technologies by skilful teachers may result in the acquisition of the 21st century skills that are necessary to learners in view of the global economy and industry. Web 2.0 technologies may provide opportunities to learners to engage in active learning, take responsibility for their own learning and develop high-

order thinking and creative skills. In addition, online environments provide platforms for learners from diverse backgrounds to come together and engage in collaborative learning. The world is changing constantly and it is essential that teachers design activities which result in learners becoming creative and problem-solving thinkers. Skilled teachers use their knowledge of content, pedagogy and technology (TPACK) to make the most of the technologies available and apply these technologies to individualised teaching.

Learners must learn the skills required to be locate, organise, evaluate and think critically about information. Effective communication is evident when learners participate in substantive conversations and when they operate successfully in teams. High quality products are the result of high productivity while technology is the tool that learners may use to acquire all the 21st century skills (Cramer, 2007).

2.2.1.9 *Criticisms against TPACK*

Researchers such as Cox and Graham (2009) as well as researchers interested in TPACK (Archambault & Barnett, 2010, Lee & Tsai, 2010) highlighted that the constructs in the TPACK framework are not clear because of the overlapping nature of the framework. In addition, more studies are needed to examine the construct validity of TPACK surveys (Koh, 2010, Angeli & Valanides, 2009, Archambault & Barnett, 2010). For example, Graham (2011) reported the difficulty experienced in distinguishing between the various constructs in the TPACK framework because of the absence of clarity around these constructs. Angeli and Valanides (2009: 60) also argued that “the explanations of technological pedagogical content knowledge and its associated constructs that have been provided are not clear enough for researchers to agree on what is and is not an example of each construct”. According to (Shinas, 2013), the lack of precise definitions of the TPACK constructs makes it difficult to develop robust instruments for measuring TPACK.

According to Polly, Mims, Shepherd & Inan (2010), two problems may be identified when using TPACK: The first such problem is that the question as to the degree to which each of the components are required for effectively integrated technology lessons remains unanswered while the second is the need for reliable and valid instruments with which to measure the TPACK in teachers. It is a complicated procedure to measure each of the domains of TPACK because they are not separate (Archambault & Barnett, 2010).

2.2.1.10 *Why TPACK?*

More than 600 journal articles on TPACK have been published proving that the TPACK framework is attracting significant attention in research and in terms of the professional development approach (Koehler et al., 2014).

According to Robin (2008), as a theoretical framework TPACK will assist researchers to come to a deeper understanding of the power of digital technology in both teaching and learning as well as the number of roles it may play as TPACK focuses on the various relationships between the knowledge of content, pedagogy and technology.

The TPACK framework places effective technology integration into teaching and learning under the microscope and addresses the problem of teachers using technology as an "add-on" instead of integrating technology into both subject matter and pedagogical principles (Chai et al., 2013). According to Koehler et al. (2014), TPACK encompasses the knowledge that teachers require for successful technology integration. Research has shown that, instead of using technology to transform teaching, it is applied rather as "efficiency aids and extension devices" (McCormick & Scrimshaw, 2001:31). The TPACK framework has had a significant impact on research, theory, teacher professional development as well as practice in teacher education (Koehler et al., 2014).

The case study under investigation is in a technologically-advanced school in which the learners are using laptops, cellular phones and Smart Response Simulators while the teachers are using interactive white boards in every class. New and emerging digital technologies are becoming increasingly accessible for use in educational programmes. Scholars have proposed a new view of the knowledge which teachers require for teaching in the 21st century with the focus shifting to learner thinking, pedagogical approaches and curriculum content within the context of learning. Teachers are having to acquire knowledge as to when and how these emerging technologies may be incorporated into specific subject matter in the interests of successful teaching (Niess, 2011).

Technology is becoming the norm in the classes and, thus, it is imperative that teachers adapt to the use of technology in their lessons (Polly et al., 2010). However, it still remains a challenge for many teachers to successfully integrate technology in the classroom (Shafer, 2008) Teachers do not feel adequately prepared for the

subject-specific use of ICT while a suitable theoretical framework to address the issues in the teaching process is lacking (Brush & Saye, 2009). However, TPACK is filling this gap and guiding teachers to the successful integration of technology into teaching. TPACK describes the knowledge which teachers need for successful integration of technology into teaching (Mishra & Koehler, 2006a). TPACK is also applicable to teachers working in the educational technology field. It has been previously used as a framework to investigate teachers' ICT-integrated lessons, to design the use of ICT in the classroom and to frame a literature review on ICT or educational technology (Polly et al., 2010). According to Chai et al. (2013), TPACK is a powerful framework for research into the use of ICT in education.

It is incumbent on teachers in the 21st century to re-evaluate the knowledge required to teach the skills that learners require in order to survive in the 21st century. TPACK is a framework that guides the thinking about the knowledge the teachers need to successfully integrate digital technologies as learning tools. It is, thus, vital that schools provide in-service teachers with the experiences that are necessary for developing the knowledge and skills that teachers require (Niess, 2011).

Niess (2011) also emphasises that the main problem currently being experienced in education is that the teachers of today have not been trained to teach their subject content using emerging technologies. Experiences in learning with these technologies are lacking as well as the knowledge required to apply strategic thinking to identifying the domain-specific knowledge and strategies needed for successful technology integration. Thus, TPACK strategic thinking is vital for teachers when they plan and prepare to guide learners to engage in content topics using technologies.

2.2.2 Vygotsky's theory

Activity theory is an analytical framework that also frames the broader educational space, that is, the socio-cultural context in which the learners function. It is used in combination with the TPACK framework to examine the activities, relationships, negations of meaning, goals and tools used in the classroom.

According to Gagnon & Collay (2006), the experiences (interactions, activities and relationships) in the classroom and digital environment are situated within the social constructivist paradigm. Both the classroom and the digital environment constitute the social context for learning with capable peers and the teacher helping learners to

acquire knowledge and skills through interaction. According to the constructivist theory learners are actively engaged in the learning tasks. Learning is facilitated by social interaction while learners take responsibility for their own learning by engaging in cooperative and authentic learning tasks and activities.

Giving learners authentic learning tasks replicates a real-life situation with the learners seeking solutions for real-life problems. It is essential that the classroom setting and atmosphere encourage communication between learners and teachers. This involves the organisation of seating patterns and relationships so as to enable learners to communicate and work cooperatively and freely. It is important that learners feel accepted and free to make mistakes in a first additional language classroom. It is only by creating a free and relaxed atmosphere and a classroom that encourages cooperative learning that the learners will be encouraged to make contributions to the learning process. In addition, such classroom conditions facilitate the autonomy of learning with the learners taking responsibility for their own learning (Gagnon & Collay, 2006).

According to Vygotsky's socio-cultural theory of human mental processing (Vygotsky, 1978) interaction with more advanced speakers of the language will help language learners to gain proficiency in the target language. In addition, scaffolding structures such as repetition, modelling and linguistic simplification by more proficient speakers may provide the necessary support to learners. Vygotsky (1978) defines the zone of proximal development as the distance between the learner's own independent ability and the learner's ability with a facilitator's guidance with learning taking place within this zone. The concept of Vygotsky's theory (Vygotsky, 1978) is reflected in a technological integrated environment such as a chatroom where scaffolding is provided. In a natural setting such as a chat room, support is provided through discussions and messages to help learners to complete tasks and support collaboration in order to construct meaning (Umstead, 2012) The learners in this case study were actively involved in the construction of meaning with the assistance of the teachers, peers, technicians and the internet. The teacher planned authentic activities and scaffolded the learning process.

Vygotsky (1978) maintains social interaction is the key to learning. Knowledge is a human product and learning is viewed as a social process in a context that allows social interactions and communication. For the purposes of this case study the

classroom and the online environment provided the social context for learning and enabled learners to work cooperatively. Van Lier (1996) posits three essential learning principles in the learning process, namely, awareness of the learning process, control over what, how and when the learner learns, and the learners must be motivated. Zhang (2009) observed that Chinese learners learning English failed to speak English fluently because they did not see the need to interact in English.

According to the Vygotskian perspective (Vygotsky, 1986), language is the tool for meaningful interactions and will produce deeper understanding than would otherwise have been the case. Language is a primary mediator of knowledge for human beings and is, thus, a primary medium through which thinking occurs. It is through tool use that individual or psychological and cultural or historical processes become interwoven and co-create each other (Daniels, 2010).

2.2.2.1 *The zone of proximal development*

According to Maurino (2007), the zone of proximal development represents the distance between what the learner knows and what the learner could *potentially* know. Each zone involves both a novice and an expert. The purpose of the expert in the zone of proximal development is to guide or facilitate the novice to reach the end of the zone, that is, for the novice to reach his or her full potential.

In this case study the learner was the novice and the expert was the teacher. The expert also included the girls who were more capable and fluent in Afrikaans than the other learners, usually the learners who spoke Afrikaans at home. It is essential that the teacher consider other factors that may influence the learning process, such as class size, diversity of learners and different levels of language proficiency. The teachers must possess a comprehensive knowledge of the learners and their abilities in order to set individual targets for the learners. These targets must be realistic as expectations that are too high may discourage learners while expectations that are too low may result in their becoming bored and uninterested. Some form of intervention must be implemented to help learners to reach their full potential. Mills (2010) supports Vygotsky's argument that teachers should help learners to reach their potential through collaboration with both experts and powerful artefacts (Mills, 2010). Learning without experience is not deep learning while social interaction creates meaning. Accordingly, the social interaction must be transmitted into virtual learning

environments. The following section looks at the barriers that hinder language learning.

2.2.3 Adapted conceptual framework

I have explained the adapted conceptual framework in detail in Chapter 1. I will now elaborate in more detail and explain the focus of this inquiry. Koehler & Mishra (2009) claim that the effective integration of technology into teaching and learning can only be achieved if knowledge of technology, pedagogy and content are simultaneously integrated. Technological knowledge (TK) refers to the use of technologies, pedagogical knowledge (PK) refers to the teaching processes used by the teacher and content knowledge (CK) refers to the subject matter that the teacher teaches to the learners (Koehler & Mishra, 2009). Four domains arose from the intersection of content knowledge, technological knowledge and pedagogical knowledge, namely, *technological content knowledge* (*TCK*), *pedagogical content knowledge* (*PCK*), *technological pedagogical knowledge* (*TPK) and technological pedagogical content knowledge* (*TPACK*) (see Figure 2.1) (Mishra & Koehler, 2006a).

The technological pedagogical knowledge (TPK) and technological pedagogical content knowledge (TPACK) guided the language acquisition process in this inquiry. Teachers with a good TPACK framework apply technology as an integrative part of the teaching process. I argue that the social construction of knowledge in the 21st century FAL classroom includes not only the integration of content, pedagogy and technology but also the acquisition of a FAL. The TPACK Framework is inadequate on its own; therefore Vygotsky's theory is merged with the TPACK Framework to form a new conceptual framework that includes the two components of FAL learning, namely, the content, that is, the grammar that forms the basis for second language acquisition and the skill, that is, second language acquisition in the zone of proximal development of the learners (see Figure 1.3 in Chapter 1). Krashen (1982) clearly distinguishes between language learning and language acquisition. Language acquisition occurs subconsciously in natural and meaningful interactions, while language learning is a conscious process of acquiring knowledge about the language, for example, grammar rules. This conceptual framework guides this inquiry and provides the lens for this investigation to direct and manage the complexity of the digital era.

In the next section I will discuss second language acquisition and learning as well as the barriers to second language learning.

2.3 Second language learning and teaching

2.3.1 Definition of a second language

In order to answer the research question, it is imperative to examine second language, second language learning and teaching as well as barriers to second language learning. Second languages include all the languages learners learn after they have acquired their first language during their earliest childhood. The learning experience may be formal (structured and planned) or informal (unplanned and unstructured). Krashen's "learning-acquisition" hypothesis correlates with the informal or unplanned acquisition of a second language (Mitchell, 2013).

2.3.2 Second language learning and acquisition

It is evident from the literature on second language that learning a second language is a process in which various factors play a role and we as second language teachers needs to be aware of such factors. According to Krashen (1982), it is possible to distinguish five hypotheses in the process of learning a second language. The first hypothesis, namely, the "learning-acquisition" hypothesis, distinguishes between language learning and language acquisition. Language acquisition occurs subconsciously during natural and meaningful interaction, while language learning is a conscious process of acquiring knowledge about the language, for example, grammar rules. Lys (2013) agrees with Hatch (1978) and Krashen (1982) about the acquisition of a language in an environment that is rich in input. Lys (2013) states that the duration of the time a learner spends in a foreign country determines the fluency of the learner because the longer the stay in the foreign country, the greater the exposure to the language and the more fluent the learner will become.

The second hypothesis that Krashen (1982) advocates, is the "monitor" hypothesis which proposes that the role of language in the language learning process is that of a "monitor" or "editor" where the learner knows the rules and focuses on the form while language acquisition supports natural communication. This hypothesis coincides with the more traditional approach described by Yule (2014) as the grammar-translation method. I believe this method still has a place in the second language classroom. In terms of this approach, second language learning is treated in the same way as any other academic subject. The focus is on vocabulary lists and sets of grammar rules. Memorisation is encouraged and there is more emphasis on the written language than

the spoken language. Learners need vocabulary in order to express themselves and unfortunately the focus in our current school system is still on grammar in summative assessments. The consequence of this focus on second language learning is that the learners often achieve high grades but are relatively ignorant about the use of the target language in everyday conversation.

The next two hypotheses, the “natural order” hypothesis where the language acquisition follows a natural order which is predictable and the “input” hypothesis which suggests that learners progress naturally with comprehensible input that is one step beyond their current level of linguistic competence are seen as the most effective way to learn a second language. Rueckert, Kim & Seo (2013) agree with Garret (1991) that interaction in the target language is extremely important. The most effective way in which to learn a language is through participation in a community in which the target language is used to communicate in a real context. The language learners are not able to hide away in such an environment and they are forced to think, speak and write in the target language. In other words, they become part of an input-rich, natural and meaningful context in which the target language is acquired spontaneously.

In addition, Ellis (2005) agrees that interaction with the aim of conveying meaning is the key to language acquisition. Furthermore, Ellis (2005), believes in the importance of both input as well as output in language acquisition. Teachers must, therefore, provide the necessary opportunities for engagement in the target language. Both Ellis (2005) and Johnson (1995) agree on the four key requirements for interaction, namely, the creation of a context of language use, the provision of ample opportunities for expression, encouraging learners to attempt activities beyond their current proficiency level and exposure to a full range of contexts. According to Johnson (1995), the optimum conditions for learner achievement are when the various tasks and the interactions are not rigid and when the learners choose the topic for discussion (Ellis, 2005). An intrinsic component of van Lier’s approach to interaction in language teaching is autonomy on the part of the learners with the learners deciding what, how and when to learn (Van Lier, 1996).

Although the traditional grammar-translation method of memorisation and written language is still needed, the learner-centred approach is more beneficial for the outcome that we want to achieve with the learners. The learner-centred approach is a

total shift away from the teacher and focuses more on the learners and their progress (Yule, 2014). This approach shift the focus away from the teacher, textbook and teaching methods to the learner and the language acquisition process. The identification of errors represents an opportunity to learn and is, therefore, a part of the second language acquisition process. The identification of errors was first regarded as negative but then there was a shift in this perspective. This approach combined with the grammar translation method will be applied in this inquiry.

Yule (2014) mentions another approach, namely, the transfer-approach, also known as the "crosslinguistic influence". This approach refers to the use of sounds, expressions or structures from the first language when communicating in the target language. According to Yule (2014) two types of transfers may occur: a positive and a negative transfer. A positive transfer is when similar features occur between the first and second language and the learner may benefit from this. On the other hand, a negative transfer is when a first language feature is very different from the second language and, thus, transferring such a feature to the second language makes it extremely difficult to understand what is being said. These transfers occurred frequently with learners who have English as their Home Language and Afrikaans as their First Additional Language and the learners benefitted in some cases. However, I have experienced negative transfers as well where it was difficult to break that habit and to correct the error because it became a habit.

The last most important approach to second language learning that I want to report on involves the role that motivation plays in second language learning. Motivation to learn is one of the important factors of the profile of a successful second language learner (Yule, 2014). I firmly believe that a good second language teacher is a good motivator who believes in his or her learners and who can inspire them to reach their full potential. In addition, Krashen (1982) advocates that one key component in the acquisition of a second language is the fifth "affective filter" hypothesis that suggests that a "mental block" may occur as a result of low self-esteem, anxiety and low motivation. This may prevent comprehensible input from being used for acquisition. Krashen & Terrell (1983) emphasise the need to lower the abovementioned affective filter to enhance the retention of language during the teaching process. Therefore, an important prerequisite for second language learning is the creation of an environment in which learners may and have a desire to learn the language. The challenge in this

study was to create an environment that accommodated the various needs of all the language learners in the class (Garrett, 1991).

Yule (2014) describes two types of motivation, namely, instrumental motivation and integrative motivation. Instrumental motivation occurs when a learner wishes to achieve a goal, for example, obtain a graduation requirement but not in order to be able to communicate socially. Integrative motivation occurs when a learner wishes to learn the second language for social purposes. A learner who is willing to make mistakes and, when given the opportunity, tries to communicate is usually more successful in learning the second language.

2.3.3 Barriers to second language learning

Age is important in second language acquisition because it determines an individual's approach to second language learning. Psycholinguists believe that younger children master a language more quickly and better than adults. This is reflected in the critical period hypothesis (CPH) (Gass & Selinker, 2001). CPH originated from Lenneberg, Chomsky & Marx (1967) who noted that language learning after puberty becomes a difficult process as, according to them, by this stage the brain has lost the plasticity and reorganising capacities which are required for language acquisition. However, this hypothesis pertains to first language acquisition only.

Labov (1972) claims that, as compared to men, women are better language learners as they have a more positive attitude to learning the second language. High levels of anxiety hinder second language acquisition and, thus, learners with a low level of anxiety will be more successful in second language acquisition than those with a high level of anxiety. Motivation is also a key factor in second language acquisition. Shabitha & Mekala (2013) and Shulman (1986) believe that highly motivated learners learning more effectively during the second language acquisition process as compared to their less motivated counterparts.

Language shock and culture shock also have an influence on the second language acquisition process. Language shock refers to the fear of appearing comical to target language speakers while culture shock is the anxiety which may be created because of exposure to a new culture. According to Brown (1977), feelings of unhappiness, loneliness, estrangement, hostility, anger, indecision, frustration, homesickness, sadness and even physical illness are associated with culture shock. In addition, a

change in the learning style may also impact negatively on the second language learning process. Furthermore, Brown (1977) states that a person with high self-esteem and who is willing to make mistakes is more likely to experience success in second language learning as compared to those with low self-esteem and who are not willing to make mistakes.

Motivation is also linked to attitude. A positive attitude will ensure positive results in the second language learning process. Finally, Shabitha & Mekala (2013) remind us that the ability to grasp a language quickly also influences the learner's potential for success. In other words, a learner with a high aptitude will learn the language with greater ease and speed than a learner with low aptitude.

2.4 Teaching with technology

Beauvois (1998) maintains that studies on second language learning and technology have investigated the use of one element of technology only. Studies focusing on learners' perceptions have, in the main, tended to explore computer-mediated communication via e-mail or networking. Salaberry (2001) reported that there are an increasing number of studies focusing on achievement and learner attitudes as a result of technology-enhanced instruction regarding learning with technology. In order to answer the question as to the effect of technology on language learning in a FAL classroom, it is necessary to investigate the findings from previous studies on the advantages and disadvantages of the integration of technology, assessment with the aid of technology, the changing roles of the 21st century teacher and learner, technology integration in the classroom as well as the stages of technology integration.

2.4.1 Benefits of teaching with technology

Dunkel (1990a) reported an increase in academic skills, language learners' self-esteem, vocational preparedness and language proficiency with positive attributes including increased motivation, more learner-centred learning, an improvement in self-concept and an increased mastery of basic skills. Armstrong & Yetter-Vassot (1994) explored the benefits of the internet, multimedia and various forms of distance education. Research showed that learners are more engaged and active in the learning process when technology in integrated, thus resulting in higher-order thinking skills and better recall (Brownlee-Conyers, 1996). Whether physically or online, when

learners actively engage with content they take ownership of their own learning (Scardamalia & Bereiter, 2003). According to Bull, Park, Searson, Thompson, Mishra, Koehler & Knezek (2007), true knowledge is not attained through passivity but rather through active engagement. In addition, it is beneficial for low achieving students because of the illustration of concepts and the organising of factual information (Nowaczyk, 1998).

Golonka, Bowles, Frank, Richardson & Freynik (2014a) agree with the above mentioned that technological innovations have more positive than negative advantages and, thus, that it is imperative that teachers seek solutions to the problems arising from the integration of technology into lessons. The most positive impact on languages occurs as a result of the increased flexibility of time and the boundaries that may be easily crossed because of the increased access to target language input as well as the interaction and immediate feedback in an informal, natural setting that social media provides. In addition, learning management systems are efficient platforms for teachers to organise course content and interact with multiple learners. However, the most important benefit of the use of technology in second language learning is the increase in the both the motivation and interest of the learners – key components for success in learning a second language.

2.4.2 Disadvantages of teaching with technology

Nevertheless, teachers should also be aware of the disadvantages of technology and look for possible solutions to these disadvantages because of the positive impact of technology on teaching and learning (Golonka et al., 2014b). The disadvantages to the use of technology, such as shallow interaction, inappropriate input and inaccurate feedback, may occur as a result of the teacher not having taken pedagogical considerations into account. In addition, learners may experience frustration if either the software or the hardware does not work or is not installed properly, distractions from the learning task and teachers ignoring the pedagogical purpose of the task (Golonka et al., 2014a). Annetta (2010) is of the opinion that, in the main, there is not sufficient commitment on the part of both teachers and learners to ensure the successful integration of technology. It is important that teachers develop new tools and applications, using advanced technologies in order to enhance both teaching and learning. Teachers are in the best position to use advanced technology in innovative

ways to realise the pedagogical goals with learner engagement being be achieved through technology integration.

Insufficient access to technology as well as a lack of time and technology skills are some of the factors that hinder teachers in integrating technology in the classroom (Tondeur et al., 2012). According to Harris et al. (2009), in-service teachers require learning experiences to enable them to select learning activities and technologies more consciously, strategically and in a varied manner, more learner-centred instructional planning and deliberate decisions to use more judicious educational technology than is currently the case. Teachers are facing significant challenges in designing technology-rich learning environments. Many of the Web 2.0 technologies are free. However, some schools have blocked certain websites and, therefore, the educational value of the internet tools and resources are not always accessible in classrooms.

Other factors that teachers need to take into account include online bullying, online predators and inappropriate content. The majority of schools have imposed restrictions on both social networking and social software. In addition, it is essential that both learners and teachers exercise cautious about online privacy and plagiarism. There is a lack of professional development in respect of technology integration may be expensive and time consuming (Nelson et al., 2009). Voogt, Knezek, Cox, Knezek & Ten Brummelhuis (2013b) agrees with (Harris et al., 2009) that the policies of an institution may either enhance or hinder the implementation of technology but that they may also provide directions for technology integration.

Another challenge is that digital technologies may be used in various ways while the inner workings of many such technologies are initially unknown to the users. The various technologies, whether hardware or software, all have their own potential, propensities, affordances, and constraints while some may address the pedagogic goals of a lesson better than others. Not all schools embrace the integration of technology. Most technologies are designed for the corporate world and not for specific disciplines or subject matter. It is, thus, incumbent on teachers to be extremely innovative and creative to deciding how technologies may be used in the classroom (Mishra & Koehler, 2008).

2.4.3 Assessment

Nelson et al. (2009) assert that technology transforms learning. Assessment within the school context refers a process during which a learner is evaluated. The results which are processed usually pertain to two issues, namely, the effect of the learning and teaching and the learner's individual progress regarding the learning outcomes. Technology has the potential to improve assessment, making it both easier and more effective than would otherwise have been the case. Learning encompasses what is being learned and how this learning content is being acquired.

Assessment provides evidence that learning has taken place and that the requisite content and skills have been acquired. Thus, transformation in assessment includes a change in the way in which the curriculum is envisioned as well as a change in the both task conceptualisation and presentation. In other words, transformation focuses on authentic instruction and assessment, moving away from whole-class instruction and focusing on new knowledge creation (Cramer, 2007). Cramer (2007) further reports that teaching and learning in the 21st century emphasise the need for authentic instruction and assessment because the changing environment makes content which is relevant to life outside of school a vital component of the teaching process. Relevant content outside of school life is a key component of authentic instruction and assessment. Authentic instruction and assessment involve teachers posing questions to learners that have value beyond school, thus enabling learners to engage in the construction of knowledge, make use of discipline-based inquiry methods and also engaged in substantive conversations about the question posed (Newman, 1994).

Cramer (2007) is of the opinion that authentic instruction and assessment make it possible for learners to learn how to find, evaluate and organise information. Learners acquire critical thinking skills, they learn how to work collaboratively in teams and how to communicate with one another and they produce high-quality products that may be used outside the classroom. The digital resources are the learning objects that are being used to acquire the requisite knowledge and skills. It is imperative that teachers take into account appropriate 21st century approaches to assessment and that they ensure that assessment tools are based on values and not on convenience. In addition, the potential for assessment must be explored beyond its role as an accountability instrument. Assessment is a powerful tool in the daily instructional practice of a teacher in the classroom while it is also part of the learning experience.

Wilson (2006) reminds us that, although technology is not the focus of 21st century education, comprehensive access to the tools of this century is a necessary part of the infrastructure which is required if 21st century learning is to occur.

2.4.3.1 *E-assessment*

Electronic or e-assessment is the result of the development of computer technology. Traditional paper-and-pencil based assessments are now perceived as outdated. Technology is being developed to help humans to perform tasks faster, more efficiently and more effectively than would otherwise be the case. Increasing numbers of higher education institutions are making use of electronic assessments as a result of both the growing number of student enrolment and the lack of personnel (Brink & Lautenbach, 2011). Benson et al. (2008) highlight the fact that e-assessment is based on the same principles and strategies for assessment as traditional assessment with the same principles of flexibility, validity and fairness also applying in e- assessment. Several universities in South Africa use electronic assessment. However, adequate training for both teachers and learners is needed and it is advisable that teachers should know about the systems in terms of secure access and how to deal with challenges as they arise (Brink & Lautenbach, 2011).

2.5 Feedback

This section discusses the role of feedback in second language acquisition. Certain aspects such as previous research on feedback, best practices and also direct and indirect feedback are elaborated upon. Hyland & Hyland (2006b) regard written, corrective feedback (CF) as an important mediator that influences the acquisition of the second language knowledge by the learner. According to Hattie & Timperley (2007), feedback refers to information regarding the performance or understanding of a person.

2.5.1 Role of feedback in second language acquisition

The role of written CF, also known as grammar correction or error correction in second language acquisition, has been a point of discussion for many years (Ferris, 2010). However, Krashen (1982) and Truscott (1996) argue that written CF has neither place nor value in second language acquisition and, in fact, they regard written CF both as harmful and an interference in the second language acquisition process. According to

Krashen (1982), the learners' affective filters are raised when they focus on the grammatical structures and they develop a fear of making mistakes when they communicate in the target language. Krashen (1982) maintains that second language acquisition occurs unconsciously and that both a low affective filter and comprehensible input are important in the acquisition process. Truscott (2007) regards CF as a waste of time and is of the opinion that the time available should be spent on the language acquisition process and not on language learning. In addition, Furthermore, Truscott (2007) maintains that focusing on the errors will mean that learners will avoid more complex structures in future.

Nevertheless, the majority of teachers and learners believe in grammar correction and written CF (Ferris, 2010). Storch & Wigglesworth (2010) reported that, in the main, teachers give CF to learners on their writing and especially on grammar and lexis errors because they believe that this will help the learners to pick up and correct their errors. Teachers assume that CF will lead to correct grammar and spelling as well as the correct use of punctuation. In other words, these short-term corrections (immediate revision) will lead to second language acquisition in the long term. Sheen (2010) agrees that CF promotes learning because learners are forced to notice the gaps in their knowledge.

2.5.2 Importance of feedback

The academic literature highlights the importance of clear and effective feedback in the learning experience (Hattie & Timperley, 2007). Hounsell (2003) indicates that researchers and practitioners acknowledge the decisive role that feedback plays in both teaching and learning. The process of learning is significantly faster and more effective when learners know how well they are doing and what their needs are if they are to improve. Nicol & Macfarlane-Dick (2006) identified the following seven principles of good feedback and which enhance the teaching and learning process, namely, good feedback provides teachers with information that may guide them in their teaching, it helps to set good standards, it helps learners with self-reflection, learners receive high quality information about their learning progress, it motivates learners and helps with their self-esteem and, lastly, it helps learners to reach their desired goals.

If feedback is to be effective, it is imperative that learners engage with the feedback and focus their attention on correcting their mistakes in order to improve their

language learning. One of the reasons why feedback is sometimes ineffective is because optimal conditions to process the feedback are not created for the learners. Wigglesworth & Storch (2012) distinguish between two types of noticing feedback, namely, substantive noticing and perfunctory noticing (superficial). Thus, the quality of noticing plays an important role in the processing of feedback. Substantive noticing will enhance the effectiveness of feedback because this type of noticing leads to a greater uptake of feedback than would otherwise have been the case.

Another method to enhance substantive noticing is to allow learners to process feedback in pairs (Wigglesworth & Storch, 2012). Gibbs (2006) highlights another fact about the engagement with feedback, advocating that teachers and learners should move away from the traditional view of teachers controlling the feedback. Learners need to adopt a self-regulated approach and take control of their own learning by first taking control of their feedback. Another words, learners need to continuously reflect and assess their work and take an active role in the feedback process. The need for learners to engage actively with feedback in order to control their own learning is being emphasised to an increasing extent in the literature. It is, thus, important to manage the time constraint to provide optimal conditions for learners to act upon the guidance provided.

Orrell (2006) agrees with Nicol and Macfarlane-Dick (2006) that poor motivation is not the primary cause of a lack of learner engagement with feedback, but that a poor assessment design does not give learners sufficient opportunities to engage with the feedback. Blair, Curtis, Goodwin & Shields (2013) confirm that more needs to be done to ensure that learners are given the opportunity to take responsibility for their own learning through self-regulated learning. It is essential that teachers facilitate and guide learners to understand and develop the skills required to engage with feedback and to use it for their own learning. Blair et al. (2013) emphasise the importance of well-constructed feedback, stating that one of the reasons why feedback fails is often because of poorly constructed, vague and/or late feedback. In addition, verbal feedback is also often lacking because of time constraints. Learners need meaningful feedback so that they may act upon it in future. Feedback should be provided as quickly as possible and in an accessible manner to enable learners to make improvements. It is, therefore, advisable that the timetable makes provision for dedicated feedback sessions. Blair et al. (2013) also suggest that teachers investigate additional feedback mechanisms such as audio or e-mail feedback. In addition, there

is also a need for teachers to tackle feedback in a more proactive way than is currently the case.

2.5.3 Research on written CF in second language writing

Ferris (2010) reports that empirical research on CF was rare before 1995. Writing was not emphasised in second language instruction. According to Sheen (2010), language learning was heavily influenced by the behaviourist views of language learning in the 1950s and 1960s and that habit formation was emphasised. Errors were perceived as damaging to learning and they had no role to play in language acquisition. However, in the 1970s and 1980s, language acquisition, Krashen's theory (1982) was driven by positive evidence but, again, there was no room for CF. Ferris (2010) refers to the amount of material that was designed in the early 1990s to address language issues in second language writing. Ferris (2010) advocates the contextualisation of written CF in the writing process. CF was prioritised to focus on frequent and serious writing error patterns and to address the individual needs of the learners. Ferris (2010) claims that the purpose of error correction is to provide strategies to guide learners to independent writing.

Truscott (1996) argues that CF is harmful to language acquisition. This argument has led to increased interest in CF and also several articles on CF (Ferris, 2010). However, Chandler (2003) disproved this theory of Truscott when he found that the accuracy of learners' writing increased in a mere 10 weeks. Chandler (2003) used an experimental group and a control group and reported that the learners completed the writing faster and with a small improvement in the quality of the content. In addition, there was more fluency in the writing of the learners. Thus, Chandler (2003) concluded that teachers need to provide error feedback and that learners must act on their errors in order to help them to increase the accuracy of their writing. The results of a study conducted Van Beuningen, De Jong & Kuiken (2012) provide convincing evidence that comprehensive CF enhances both grammatical and non-grammatical accuracy during revision and also in new pieces of writing. In addition, they provided counterevidence to the notion that CF results in learners avoiding complex structures. Their results also did not prove that learners benefit more from writing practice than from CF. Thus, the findings of their contradict Truscott's argument that CF is both ineffective and potentially harmful to second language acquisition. Van Beuningen et al. (2012) conclude that comprehensive CF is useful in helping learners to improve the

accuracy of their writing. Bitchener (2008) also provides convincing evidence on the improvement of a limited range of grammatical structures.

2.5.4 Types of feedback

Alavi & Taghizadeh (2014) reports on the verification and elaboration types of feedback which may be presented in the forms of implicit and/or explicit feedback. When implicit feedback is used the learners have to correct their errors without any indication or pointing out of the errors in their output and, thus, the corrections are elicited from the learners themselves. On the other hand, with explicit feedback the errors are being pointed out to the learners. According to Wigglesworth & Storch (2012), feedback may be classified in terms of its explicitness or directness. The literature on written CF makes a clear distinction between direct and indirect feedback. In terms of direct feedback the teacher or another reader gives explicit corrections while, in indirect feedback, the learner's attention is drawn to an error but the learner has to correct the error. Second language writing researchers regard indirect feedback as a valuable means both to guide the learners to problem-solving and to provide opportunities for learners to take responsibility for their own learning progress (Ferris, 2010).

According to Ferris (2010), learners prefer indirect feedback to direct feedback. Another important fact to consider when providing feedback is first to determine the goal of the feedback. For example, the purpose or outcome of the writing activity influences the type of feedback. If the goal is to focus on a specific feature of the writing, then direct correction would be the most efficient. If, however, the goal is to assess the success of possible strategies for developing revision or editing processes, then indirect feedback that requires more effort or engagement on the part of the learner may be more efficient (Ferris, 2010). Ferris (2004) also recommends that teachers provide direct feedback for learners with low levels of second language proficiency because they would not have the ability to self-correct their errors.

Chandler (2003) discusses four different kinds of ways in which teachers may respond when they give WCF. These include, firstly, direct correction which, as mentioned previously, involves providing the correction to be made, secondly, indirect feedback which is done by underlining the error and providing a marginal description of the type of error, thirdly, and also indirectly, by merely giving a marginal description of the type of error and, lastly, by simple underlining the error with no indication or description of

the type of error (indirect). The use of direct correction usually demonstrates a vast improvement in the number of errors because the learners simply rewrite the correction that the teacher had given. The underlining with a marginal description of the error has proved to be the second most successful method with learners correcting more than two-thirds of their errors. The final method in terms of which the teachers merely pointed out the location of the error has proved to be the least successful method although learners were still able to correct half of their errors. However, Chandler (2003) reports that the most effective way in which to gather evidence of learner improvement was with a different and new piece of writing that learners complete with fewer errors. In contradiction to the assertions of Ferris (2010) as described previously, it was found by Chandler (2003) that learners preferred direct feedback because it was much easier and quicker than indirect feedback. However, it was also found that the learners felt that the best way to learn from the mistake and to avoid a repeat of the mistake in the future was when the teacher underlined the mistake with a marginal description. The learners felt they learnt more by self-correcting.

2.5.5 Best feedback practices

Ferris (2014) reports best practice suggestions of feedback from the literature of written CF. Teacher feedback should focus on the content, language, style and organisation, while the responses of the learners on the feedback will vary according to the individual needs of the learners. In order to ensure that feedback is valuable, learners should follow a process writing approach in terms of which multiple drafts are written and not merely one final draft. Furthermore, it is beneficial to have more than one reader to provide feedback in order to obtain input from different readers. In addition, it is also better to interact with a learner on a one-on-one rather merely to write comments on the paper. Feedback should be clear and specific. Feedback should also encourage the learner and must include constructive criticism.

Teachers need to be cautious of feedback appropriation while questions are better than imperatives because questions promote learner autonomy. The teacher should focus on content and organisation in the early stages of the writing process and attend to the grammar last. Comprehensive error correction may be overwhelming and discouraging while selective error feedback or feedback on specific error patterns is more beneficial. Indirect feedback is also more valuable to the learners than direct

feedback. With regard to peer feedback teachers need to ensure that learners are trained before the activity, that the task is carefully structured, that the groups are carefully constituted and that accountability mechanisms are built in to the process to ensure that the learners are serious about the process. Ferris (2004) highlights the importance of learners revising and self-editing their work during class time where they are able to consult with their peers and/or teacher. Teachers may also provide supplemental grammar instruction in class or as self-study, depending on the individual needs of the learners. In order to increase their awareness of their errors and for the purposes of improvement, Ferris (2004) advises that learners keep a maintenance error chart.

In conclusion, there is little doubt about the importance of feedback in second language learning. In fact, it is now more important than ever because it may help learners to take responsibility for their own learning. The technology which is available means that learners may be more autonomous in their learning process than was previously the case. By providing meaningful feedback, teachers are becoming facilitators and they are guiding the learners to take responsibility for their own learning.

2.6 The teacher in the 21st century

Voogt, Erstad, Dede & Mishra (2013a) are of the opinion that the “game of teaching” in the 21st century had changed and, therefore, the players need to change. It is essential that teachers acquire 21st century competencies to enable them to support 21st century learning. Thus, it is incumbent on them to adopt new pedagogical approaches that may result in the correct “fit” between pedagogy, technology and specific subject matter. In other words, technology must not be integrated merely as an “add-on”.

Yu-Mei (2002) is of the opinion that technology integration fails because teachers are still trying to follow traditional practice but with the new technological devices. Teachers need to redefine their role in the classroom. Teachers working in technology-enriched classrooms soon realised that they had to change their traditional ways of thinking and teaching. Technology affects the way in which learners learn, teachers teach and school administrators work with technology changing the classroom organisation, the social learning climate and the teacher-learner interaction.

For example, the classroom must be arranged in such a way that group work, as well as individual interaction between learners, and learner and teacher, are both convenient and easy. Learners work independently, taking responsibility for their own learning. In addition, they work collaboratively or in small groups with the teacher working either with individuals or small groups but not with the class as a whole. This facilitates individual learning while individual needs are being addressed. Learning is active and not passive, collaborative rather than individual and is learner-centred instead of teacher-centred. This means that individual needs are met. Teachers strive to realise the vision of self-regulated learners who set goals for themselves and monitor these goals. Teachers are not authoritative but, instead, they assume the role of a decentralised facilitator.

It is imperative that teachers change their vision of the curriculum and also reconsider the way in which tasks are conceptualised and presented to the learners. Teachers must move away from the traditional, whole classroom instruction to authentic instruction and assessment which support individualised teaching (Cramer, 2007). Angeli & Valanides (2009) report that the majority of scholars are in agreement that the preparation of teachers for the educational uses of technology is a key component in almost every improvement plan for transformation in education.

Nelson et al. (2009), a teacher's philosophy influences the effective use of internet technologies in the classroom. The teacher who realises the value of collaborative projects and authentic activities often defines him or herself as a coach, facilitator and resource to support student learning while realising the importance of guiding learners to achieve autonomy through constructivist philosophies. Such teachers motivate learners to take responsibility for their own learning. Activities such as discussions, debates, cooperative student projects, and the freedom to explore the content are the focus of student learning. In addition, the internet and Web 2.0 technologies are used extensively in these activities while teachers are flexible with their instruction as long as the curriculum goals are met at all times. Such teachers are comfortable with the use of technology and they help learners to make the connection between the real world and the curricular content.

Furthermore, Nelson et al. (2009) also found that teachers are moving away from merely providing information to learners to adopting the role as facilitator. This means that teachers require professional development opportunities. According to the TPACK

framework professional development extends beyond workshops which are designed merely to enhance content knowledge. Mishra & Koehler (2008) suggest a new kind of literacy that goes beyond the specific knowledge of particular disciplines. It is essential that a teacher's understanding of technology is constantly growing because of the rapid pace of changes in technology. Professional development is, therefore, an ongoing process

The focus of teachers' professional development must be on what teachers are able to do to guide and advise learners when they design the learning process. Teachers are partners in the learning process and it is vital that they not focus on merely reproducing factual information to their learners but, instead, they must focus on how learners may be assisted. Thus, a school's pedagogical culture must be based on the principle of the teachers being partners in the learning process with the learners taking responsibility for their own learning and the teachers and learners creating, expressing and communicating collaboratively (Gordon et al., 2009).

2.7 The learner in the 21st century

Dede (2005) is of the opinion that learners today are growing up in a world in which technologies are second nature for them. Thus, the technological changes in their environment are reshaping the learning styles of this *Net Generation*. Emerging learning styles such as fluency in multiple media, balancing of experiential learning, simulation-based virtual settings, collective reflection, communal learning, guided mentoring, non-linear representations and the co-designing of learning experiences personalised to individual needs and preferences are being reported. According to Annetta (2010), it is, therefore, crucial that teachers adapt their teaching styles to the new learning styles of this digital generation.

The education system must be reformed to accommodate the changes in the learning needs, styles and preferences of a new generation. According to the proponents of such reform, the members of this new generation, born after 1980 and termed the "Net Generation", "Digital Natives" and the "Millennials", have been surrounded by technology throughout their lives (Ghaith, 2010).

Strauss & Howe (2000) reported that the learners in the 21st century, the Millennials, tend to turn instinctively to the internet for help regarding their homework, information on new products or entertainment such as gaming. According to Cramer (2007), the

21st century learners prefer instant text messaging while multitasking comes naturally to them. Multitasking may be seen as a response to the overload of information and, consequently, they have no tolerance for delays. They regard being smart as cool and they would rather do homework than watch television (Cramer, 2007). They were born in the digital age and they are, therefore, challenging to teach because technology has been part of their lives since they were born. In addition, they are highly competitive and are also ethnically and racially diverse. Diversity is a norm to them and, therefore, they believe in collaboration and teamwork (Cramer, 2007).

2.8 Technology integration

The issue in teaching and learning is no longer whether or not teachers should integrate technology into their teaching but, rather, how they should use technology in their teaching in order to provide new opportunities for learning (Angeli & Valanides, 2009). Mishra & Koehler (2008) maintain that there is no one ideal way in which to integrate technology into the curriculum and, in fact, the integration of technology must be creatively designed for a specific subject matter within a specific classroom context. Gordon et al. (2009) reported that the "ideal" learning environment for key competencies should encompass a more individualised approach compared to the traditional whole class approach, collaborative cross-curricular teaching as well as sound leadership that builds on the vision of school development and encourages teamwork.

Barr & Gillespie (2003:69) regard learning with technology as an integrated process, stating that

> … a computer-based environment needs to be carefully constructed in order to ensure that all the other components of learning are effectively integrated into it. It is important to ensure that the uses of computer technology in this type of environment are not seen as separate, but rather that they are integrated, working together to enhance the process of teaching and learning … CALL packages must not be seen as stand-alone creations.

Thus, technology is a teaching tool and it must be used to integrate the learning and teaching methods with the available resources. In addition, technology must be used to realise pedagogical goals and it must not be forced to fit a lesson. If other more

conventional teaching and learning methods may be used to ensure that the learners grasp the subject matter successfully then there is little point in using computer technology. Technology is not a stand-alone tool but, instead, it offers support to the total environment of learning. It is also extremely important that the principles of sound pedagogy are understood because technology is changing constantly and at a rapid pace (Murray & Barnes, 1998). The pedagogical goals must be clear and sound teaching methods must be regarded as paramount. The use of technology merely supports the realisation of the pedagogical goals and, thus, these goals must be considered before technology may be integrated into teaching (Levy, 1997). Mishra and Koehler (2008) therefore regard teachers as designers because the majority of technologies are designed for the corporate world and not for educational purposes.

2.8.1 Phases of technology integration

Valdez, McNabb, Foertsch, Anderson, Hawkes & Raack (2000) identify three phases of technology integration in a school (see Figure 2.2) :

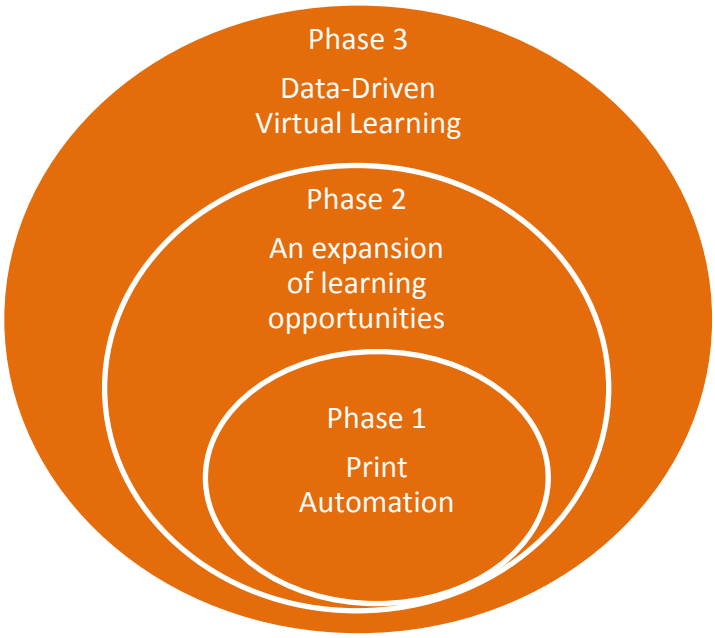

Figure 2.2: Phases of technology integration

Source: (Valdez et al., 2000)

In Phase 1, the "*Print automation"*, computers replace the tasks that were previously done manually or using paper. Thus, technology is merely an add-on and computer skills are taught as a separate subject. This includes tasks such as drill-and-practice

games or the typing out of assignments. The role of the teacher is vital in this phase and the teacher takes responsibility for the learners' learning.

Phase 2 involves *an expansion of learning opportunities*. Learners and teachers use technology to conduct research, engage in conversations with other people throughout the world and use the internet for learning. Instruction is based on 21st century skills but the problems addressed are not real-world problems while the solutions are presented to the learners in the class and not in the outside world.

Phase 3, the "*Data-driven virtual learning"* phase, is characterised by authentic instructions that are "just enough, just in time, just for you" (Chitwood, May, Bunnow & Langan, 2000). Learners try to solve real-world problems by means of data-driven decision-making, critical thinking and communication with others outside of school and they then present these solutions outside of school. Twenty-first century skills are developed and applied and the learning process is richly supported by learning objects (Chitwood et al., 2000).

Niess (2011) observed in-service, professional development over a period of three years and proposed five levels of the developmental progression in TPACK. Niess (2011) explains that the first level involves recognising (knowledge) the alignment of the technology with the subject matter content but with no integration of the technology into the teaching and learning. However, teachers are able to know how to use the technology. The next level involves accepting (persuasion), with the teachers forming an attitude towards teaching and learning. This attitude may be either favourable or unfavourable while specific content topics are taught using the appropriate technology. The third level is the adapting (decision) level at which teachers make a decision whether or not to adopt or reject teaching and learning using an appropriate technology. The exploring (implementation) level follows with teachers actively integrating the teaching and learning of specific content topics with an appropriate technology successfully. The last level is the advancing (confirmation) level with teachers redesigning the curricula and evaluating the results of integrating technology into the learning and teaching process.

Based on my experience at the school I agree with Valdez et al. (2000). Initially, the teachers assumed responsibility for the successful integration of technology and played an autonomous role. Technology was an "add on" rather than being integrated into the teaching and learning. The school then moved on to phase 2 where the

learners and teachers used technology to conduct research and certain subjects started using social media such as blogs. The internet was also used for learning. The last phase was the integration phase during which the learners' and teachers' 21st century skills are developed and applied with the integration of technology supporting the process of teaching and learning.

2.8.2 Emerging technologies

The technological aspect of the environment in which teachers teach and learners live is constantly changing at a rapid pace. It is, thus, vital that teachers are aware of the new technologies which are available and how they may integrate these technologies into their lessons. The findings on emerging technologies and which are discussed below sensitised me regarding the technologies available in order to find an answer to the sub research question on technology relevant in a 21st century FAL classroom. The next section discusses the findings of studies on the latest emerging technology, namely, mobile-assisted language learning (MALL), and its challenges.

2.8.2.1 *Mobile-assisted language learning (MALL)*

MALL, also referred to as m-learning is currently attracting considerable interest from researchers in language education, application developers, teachers in other subject domains and writers of material in the educational field. This growing interest may be attributed to the fast growth of mobile devices (Kukulska-Hulme, 2009). MALL receives more attention than computer-assisted language learning (CALL) because of its perceived advantages of which its mobility is the biggest. In this fast paced world in which people are looking for more productivity in less time, *mobility* is the keyword. People want to do what they want to do, wherever they want to and when they want to. Mobility includes learner mobility, mobility of technology, mobility of content etc (Kukulska-Hume, 2009).

Kukulska-Hulme & Shield (2008:273) stated that:

> MALL differs from computer-assisted language learning in its use of personal, portable devices that enable new ways of learning, emphasizing continuity or spontaneity of access and interaction across different contexts of use.

Messages may be sent in various ways to learners with mobile devices. Furthermore, mobile devices, such as mobile computers, pocket PCs, Apple iPhones, Android phones and tablets, enable communication through voice and image as well as text. According to Lan & Huang (2012), mobile devices for educational purposes are becoming common practice among learners. Golonka et al. (2014b) confirm that smartphones and other mobile internet-accessible devices are becoming increasingly accessible as compared to the older existing technologies. However, there are a few empirical studies only that have investigated the effect of mobility on learners and their potential. Most of the studies relate to MALL have focused on vocabulary-related research (Godwin-Jones, 2011). Other researchers such as Wong, Chin, Tan & Liu (2010), Jung, Park, Bae, Lee & Kim (2011) and Wong & Looi (2010) investigated language learning using various mobile devices such as mobile phones Apple iPhones and pocket PCs. These researchers highlighted the mobility and connectivity of mobile devices as well as their potential for innovation in language learning for learners across different environments.

In addition, Valk, Rashid & Elder (2010) demonstrated how mobile phone facilitated learning may give learners increased access to educational materials and services, particularly in the developing countries and, especially, in rural and remote regions. However, previous studies have proved that small screen size devices creates cognitive disadvantages related to the attention and visual perception of learners (Jung et al., 2011). However, it has also been reported that learners want more options to make learning tools more convenient in order to break down the digital divide. Another advantage of the use of personal devices is the learners' ownership of the learning that may lead to positive language learning experiences (Kukulska-Hulme, 2009). Studies have shown that mobile phones are increasingly being used for the acquisition of language skills, including improving the learners' knowledge of grammar, listening, speaking and vocabulary (Stockwell, 2010). However, despite these advantages were reported, many teachers are hesitant to integrate these devices into the language classroom because they do not understand how language learning and teaching could benefit from such integration (Kukulska-Hulme & Shield, 2008). Although the impact of the iPad on learners of all ages and backgrounds has been investigated (Roscorla, 2011), a few empirical studies only have been published. The positive outcomes reported include positive learning effects on both reading and writing (McClanahan, Williams, Kennedy & Tate, 2012). These studies "demonstrate

general principles in terms of ways of using tools, physical spaces, time allocation, means of communication, distribution of roles, resources and so on" (Kukulska-Hulme, 2009:158).

International research has highlighted the potential of new, cost-effective technologies such as social network sites (Facebook) or micro-blogging applications (Twitter) as regards their use in the classroom. Learners are using these applications every day and with such applications transforming existing teaching and learning practices (Meyer, 2010). The social communication features are opening up the opportunity for participation in more collaborative learning environments than previously (Chinnery, 2006) with the social media providing a platform for the collaboration, learning, interaction and co-creation that may lead to improved teaching and learning (Wankel, 2011b). Learners are able to practise writing on social media (Jones, 2011) and because of this benefit of social media, writing is also being extensively researched. In addition, this provides an opportunity for interaction and communication between teacher and learners (Wankel, 2011b). Social media may be a valuable tool to help with the individualised teaching of languages as it offers opportunities for more personalised learning and teaching experiences than is currently the case. Social media also enables learners to communicate in languages other than their mother tongue and also either formally or informally with language support being provided as needed (Ng'ambi, 2008).

2.8.2.2 *Challenges with MALL*

The integration of mobile learning devices has also presented challenges such as the limited access because of the cost and service of the device. It is, thus, not possible for all learners to have consistent access to mobile technologies. Chinnery (2006) reported frustration with new technology when it is used as a learning tool in the classroom while several teachers and learners resist incorporating new technologies into their teaching and learning. In addition, technology-oriented training and resources often do not cover the nature of the learning when this new technology is used (Chinnery, 2006). The research conducted by Stockwell (2010) emphasised that technological, pedagogical, psychological, or even environmental barriers must be taken into account when using mobile learning devices for educational purposes.

It has been shown that the more learners become accustomed to digital interfaces, the more their learning styles and their perception of the learning material change

(Stockwell, 2010). However, it is important to be aware that smaller chunks of subject matter are more suited to better mobile phone learning experiences. Thus, mobile learning content should be short and segmented (Rueckert, Kim & Seo, 2013). This has been long advocated by academics such as Rutherford & Smith (1987) and Krashen (1989).

Rueckert et al. (2013), mobile phone-assisted learning should engage learners and it should also not be too demanding. Learners should be consulted as regards certain aspects of the material development because they know what would interest them and how they learn best. In addition, topics for reading must be interesting and relevant to the learners, taking into account cultural differences and involving school life, jokes and entertaining stories. It is also essential that internet security is carefully considered before mobile learning is introduced.

2.8.2.3 *New and emerging technologies*

Table 2.1 below presents a list of new and emerging technologies, brief descriptions of such technologies as well as possible applications in the language classrooms (Golonka et al., 2014b).

Table 2.1: New and emerging technologies

Technologies	Brief description	Example of applications in the language classroom
Classroom-based		
Course management system (CMS)	A server-based application for materials such as syllabi, prescribed readings, calendars etc and the resources required for blended or distance learning. May be accessed on a network through a web browser.	Sharing of course materials. Learners may access the material anytime and anywhere. Offers opportunities for teacher-learner and learner-learner communication and is an aid to the teacher in organising the course content.
Interactive white board	The main advantage of the interactive white board is the interactive display of the image on the computer screen on the white board. The computer screen is easily visible to all learners.	Teacher may incorporate authentic content on the internet into classroom lessons. Collaborative work and interactive learning are promoted through the use of the interactive white board.
ePortfolio	It is a digital showcase of the learners' work and shows evidence of the learners' achievements and progress.	Learners take responsibility for their own learning. They set their own goals and monitor their progress. The process of learning is emphasised instead of the product. Self-assessment skills are developed.

Technologies	Brief description	Example of applications in the language classroom
Individual study tools		
Corpus	Corpora are a collection of authentic language in spoken form, written form, or both. Differ in terms of medium, design and content.	Provides access to rich, authentic input and linguistic data and, thus, promotes data-driven, inductive learning.
Electronic dictionary	A digital dictionary in electronic form that may be either handheld or online.	Used for quick searches so that the looking up of words does not significantly interrupt the learning process. Promotes individualised learning and input.
Electronic gloss or annotation	Enables learners to access glosses or annotations while reading, usually in the form of a hyperlink.	Helps with reading comprehension and vocabulary learning. Is an efficient tool for the looking up of unknown words and has a multimedia capability.
Intelligent tutoring system	The program acts as a tutor by providing direct, customised instruction and/or feedback to a learner. It usually consists of an interface, an expert model, a student/learner model and a tutor model.	Provides tailored instruction and immediate and specific feedback to the individual learner.
Grammar checker	A program designed to evaluate the grammar in a written text. It is often packaged with spellcheckers in word processing programs.	Identifies morphosyntactic errors and provides immediate feedback.
Automatic speech recognition (ASR) and pronunciation program	The program identifies the words a person speaks into a microphone and provides feedback on aspects of performance.	ASR is an excellent tool for individualised learning because the learner is able to work individually on his/her speaking ability and at his/her own pace. The program compares a learner's voice with the target pronunciation and provides feedback.
Network-based social computing	Provides a virtual world that enables learners to move characters and objects in a 3-D graphical environment. Activities depend on both the program and the specified goal or set of goals.	Virtual meeting spaces are created and learners are able to create different characters. It encourages role play while enabling learners to navigate easily in simulated environments.
Chat	A form of synchronous computer-mediated communication and which may be either text-based or include audio.	Is used for communication and collaboration between learners. Learners may communicate with native speakers without the barriers of distance or location. Interactions may be printed for review and assessment.

Technologies	Brief description	Example of applications in the language classroom
Social networking	Social networking, for example, Facebook enables peer-to-peer communication and collaboration. Profiles are created and networks are joined on the basis of geography, interests, associations, or friendships.	Enables communication between learners with similar interests as well as interactions with native speakers and other learners of the target language.
Blog	It is a web application where the blog owner makes entries. The blog is visible to other web users.	Enables collaborative learning and may be used for personal journaling or blogging. Bloggers receive feedback in the form comments on blog posts.
Internet forum or message board	It is an asynchronous communication application where messages are sent to multiple recipients. A notification is often sent to a user's e-mail address when an update is posted. Messages are grouped according to topic.	Promotes communication and organised discussions according to topics.
Wiki	It is a website that allows multiple users either to post or edit information.	Helps learners and instructors to find information easily. It also promotes collaboration.
Mobile and portable devices		
Tablet PC or PDA	A tablet personal computer is a portable personal computer with a touchscreen. A personal digital assistant (PDA) is a hand-held, mobile, computing device with features such as a calendar, word processing, contact list, and applications such as Excel, PowerPoint and Adobe Reader.	Allows handwritten computer input in target language scripts. It may be used to capture diagrams and illustrations digitally.
iPod	It is a portable media player produced by Apple Inc. and may be used to play downloaded television shows and movies. It has a small screen for viewing. Podcasts as well as audio and video digital-media files may also be downloaded for use with the iPod.	It is a portable hard drive for data upload and download. It provides rich input through language-learning podcasts and broadcasts of authentic speech. Learners may record speech samples or homework activities digitally.
Cell phone or smartphone	A cell phone and a smartphone are both mobile phones. Different phones have different capabilities. A smartphone often has a keyboard, internet and e-mail abilities. Most importantly, it has the capacity of an operating system and related software.	May provide mobile internet access. It enables teacher-learner and learner-learner communication. It may be used in language learning activities that use text messaging and the taking and sharing of pictures.

Source: (Golonka et al., 2014b: 72-76)

The emerging technologies that were used in this case study included the cell phone or smartphone, discussion board, blogs, Moodle Learning Management System

(LMS), chat rooms, network-based social computing, electronic dictionary, ePortfolio, smart response simulator, speaking avatars and the interactive white board.

2.9 Turnitin

Flanagan & Shoffner (2013) note the importance of the widespread availability and influence of digital technology in both everyday life and the educational sphere. The meaningful use of technology may have a positive impact on teaching and learning. Penketh & Beaumont (2014) also mention the widening gap between the skills of learners leaving school and the expectations of institutions. However, the use of Turnitin may address this concern as several institutions are using Turnitin to help with feedback in writing.

2.9.1 The use of Turnitin

Heckler (2013) regards Turnitin as an educational tool that may be used to educate learners about acknowledging and praising the original work of other people, the correct citation of other people's work and the consequences of plagiarism. Kunka (2011) explains that, as a web-based application, Turnitin is fundamentally a plagiarism detection tool that may be used to assess a learner's own work. According to Kunka (2011), when Turnitin is used as a plagiarism detection tool, it works as follow: A Turnitin administrator is appointed by each school or institution and the appointed person is responsible to manage the instructors' accounts, provide the necessary training and act as the direct contact to provide help and support if needed. Individual accounts are created by instructors and learners with Turnitin. Instructors create their own classes by uploading learners and also individualised assignments.

Once a class has been created by the instructor, learners may join these classes by creating their own accounts using the class identification number and password provided by the teacher. Learners may join multiple classes with different teachers as long as they use the correct class identification number and password for a specific class. When learners submit assignments, Originality Check Turnitin compares the assignment with a huge database of internet sources and provides an originality report that is accessible to both the learner and the instructor. Doe (2013) explains that a file may be submitted by uploading the file or by cutting and pasting. Kunka (2011) indicates that the originality report shows the percentage of material that has been copied and highlights the items that have been copied. Quoted material and

bibliographies may be filtered out when the instructor creates the settings for the assignment. Turnitin also incorporates a grade mark option that allows the electronic submission, marking and returning of work online, thus reducing the waste of paper. Doe (2013) notes that writing rubrics and evaluation tools are available on Turnitin. A major advantage of Turnitin is the fact that both the evaluation tools and the feedback may be modified by the instructor. The instructor is able to drag-and-drop the quick mark comments, the existing or modified rubrics or leave voice comments for the learners. Educational Testing Service e-rater technology is integrated with GradeMark and identifies the errors in grammar such as spelling mistakes.

According to Kunka (2011), Turnitin may be used for pointing out errors, corrections and recognition of outstanding work. One of the advantages is that error identification and corrections may be customised, thus making marking much easier and faster than would otherwise have been the case. Turnitin also allows peer marking and provides standard questions to help with such peer marking. The peer marking is anonymous. Either the instructor may assign reviewers or Turnitin may do it randomly. Peer marking, however, should be monitored closely to ensure that it is a worthwhile process and the instructor must provide accountability mechanisms to ensure that learners take the peer marking seriously. Roper (2013) highlights the distinctive use of Turnitin for marking and feedback. *PeerMark*, a feature of Turnitin, may be used as a learning tool because it promotes critical thinking and provides additional feedback in an anonymous environment in which learners examine each other's work. *GradeMark* is another feature of Turnitin which makes quick feedback possible by the use of pre-set or customised comments and rubrics. By integrating all the components, the quick electronic evaluation and validation of the learners' work is made possible, thus saving the teacher time. In addition, it may also be used as a learning tool. Turnitin is user-friendly because it is always available, it is user customised and it provides considerable training and support. Kunka (2011) points out that Turnitin also provides videos and articles to assist with training. Help desk support is available to instructors and learners via videos, e-mail and phone. In addition, the help centre provides additional help videos and articles according to need.

There are, however, some concerns about the use of Turnitin. Learners and instructors have to be computer proficient and the learning process may take a while. In order to take advantage of the electronic submission, marking and feedback, learners and instructors need to have regular access to computers. In addition, the

cost of the license per year may be high – quotes are available online from the Turnitin website at www.turnitin.com. Doe (2013) confirms that it is easy to use Turnitin because it contains clear, intuitive instructions. He remarks that inadequate computer access and training the learners to write in digital format are usually the causes of any difficulties with its use. Buckley & Cowap (2013) confirm the easy use of Turnitin in terms of functionality and state that it is relatively easy to overcome any difficulties that may be experienced. Nevertheless, despite the above concerns, Heckler (2013) notes that, globally, the Turnitin detection software is the most utilised plagiarism detection service available. Heckler (2013) also highlights the advantages of the software in reducing plagiarism, teaching the value of academic integrity and following through with punishment for this misconduct of plagiarism.

2.9.2 Previous research on Turnitin

Davis & Carroll (2009) report that studies have investigated the impact of Turnitin on educational practice with the capacity of Turnitin as a deterrent to plagiarism being highlighted. According to Baker, Thornton & Adams (2011), preliminary research suggests that teachers benefit from detecting plagiarisms because of the resultant decrease in plagiarism levels. Buckley & Cowap (2013) confirm that the teachers' workload decreases while there is also a reduction in the time spent on marking assignments and searching for instances of academic misconduct. In the main, the quality of the assignments improves and fewer incorrect referencing practices and fewer instances of plagiarism are found. According to Buckley & Cowap (2013), it would appear that Turnitin increases the learners' knowledge of plagiarism.

In general, Turnitin is positively received by teachers. The only difficulties usually involve inserting *QuickMark Comments* on the text while the second marking in *GradeMark* is often a challenge. Dahl (2007) reports a positive response of learners towards Turnitin with the learners welcoming Turnitin in that it helped them avoid to plagiarism while they also prefer the electronic submission of assignments. However, Davis & Carroll (2009) also mentions the controversies around Turnitin. Although it may help learners to avoid plagiarism, some academics are concerned that Turnitin is detracting from the teacher's responsibility to support learning. A few studies only have investigated the role of Turnitin in supporting learning, rather than guiding assessment while even fewer studies have explored the role of formative feedback in supporting learning. Davis & Carroll (2009) investigated the role of formative feedback

with the use of Turnitin to avoid plagiarism. The results showed that formative feedback on a one-to-one basis had a positive impact on reducing plagiarism. In addition, by using the Turnitin originality reports, the learners were more engaged and being given direct advice in a non-threatening formative way. This approach appeared to be effective. Heckler (2013) emphasises that a supportive context is critical when implementing Turnitin.

However, some institutions were reluctant to embrace this perception of the use of Turnitin to avoid plagiarism because of a fear of losing learners. Nevertheless, the institution has a responsibility to educate learners not to plagiarise and it is essential that punitive measures are in place to deal with misconduct should a learner plagiarise. The implementation of Turnitin highlights an institution's commitment to academic integrity. Turnitin survived legal challenges in 2008 when it was accused of violating the copyright of owners by storing work on its database without permission (Morgan & Vaughn, 2010). According to Morgan & Vaughn (2010), the use agreement was updated after this court case and the option to not have papers searched and to keep the identification of those whose works are searched confidential was installed.

2.9.3 Self-directed learning and Turnitin

Chen, Wei & Huang (2013) reports on the pedagogical value of electronic assessment by explaining that it may help learners to reflect on their work and that this may lead to increased autonomy on the part of learners because they take responsibility for their own learning. In addition, feedback is infinitely more valuable when it is delivered as soon as possible. Rolfe (2011) found the use of Turnitin to be extremely valuable in terms of literacy development. Turnitin highlights the areas that require rewriting and it may be a useful tool in motivating learners to improve their literacy skills. The active engagement of learners that results from the use of Turnitin is also more beneficial for learning as compared to passive reception while the colourful report with clues which is provided is also more successful than mere written feedback. In addition, this approach also encourages the self-directed learning that leads to learners to take responsibility for their own learning (Rolfe 2011). However, instant feedback does not guarantee reduced plagiarism and learners still need to be educated. Rolfe (2011) reported that large numbers of learners had no problems in submitting draft assignments and receiving feedback. Comparisons between the initial assignment and the final submission showed improvements. Nevertheless, despite this improvement,

the learners' citation skills deteriorated and the use of Turnitin did not have any impact on referencing.

Rolfe (2011) adds that, although Turnitin has the potential to lead learners to self-directed learning, he also noticed a lack of discipline in the self-directed learning of the learners. It is vital that self-directed learning is introduced in a supportive environment, especially if there is a low level of prior knowledge. Self-directed learning is successful when learners have a sense of responsibility and autonomy about their learning.

2.10 Key drivers for technology adoptions

According to Johnson & Adams (2011a), the key drivers for technology adoptions for the period 2011 to 2016 in the United Kingdom include the abundance and accessibility of resources and relationships via the internet. Firstly, the purpose of schools and tertiary institutions is to prepare learners and students for the world in which they live in and they must be taught the skills required to assess the credibility of information. Secondly, blogs, electronic journals and open textbooks are increasingly common and are readily accepted. Thirdly, information may be retrieved no matter where we are or what device we are using.

Employees encourage collaboration for collective intelligence. Wikis, Google Docs, Skype and online fora facilitate group work and communication. Bandwidth is increasing, thus enabling learners and teachers to connect and collaborate more easily and to store and transfer files and information more quickly than was previously the case. People want to work, learn and study anywhere and anytime while learners must constantly balance demands from home, work and school. Accordingly, a faster approach is often perceived as a better approach. People want easy and timely access to information as well as easy access to their social networks. Mobile devices are seen as an extension of personality and learning style. In addition, mobile devices are smaller, lighter and better connected than ever before with smart phones and other mobile devices becoming increasingly popular.

2.11 The curriculum

2.11.1 Technological modernisation and globalisation

Two main justifications for the knowledge required in the 21st century emerged from the analysis of various frameworks conducted by Kereluik, Mishra, Fahnoe & Terry (2013), namely, technological modernisation and globalisation. An economic shift has occurred in the developed countries from manual and routine jobs to an intellectual and knowledge economy while the use of technology primarily in the workplace has spread to our personal and professional lives. In addition, there are no longer national, economic and social boundaries and, instead, we have a newly interconnected and diverse global society which has been brought about by technological modernisation (Kereluik et al., 2013).

2.11.2 Content knowledge in the 21st century

Cramer (2007) emphasises the importance of both the core subjects as well as the learning of skills such as self-directional skills, problem-solving skills, interpersonal skills and information and communication skills in the curriculum. In addition, the use of 21st century tools in a 21st century context that includes global awareness and 21st century assessments are key elements of learning.

Learners and teachers are faced with huge amounts of information on digital screens (Collins, 1992). It is essential that teachers guide learners to acquire the knowledge required for living in the 21st century (Kereluik et al., 2013). There is a gap between what learners learned in the past and what is needed today in the 21st century. In addition, learners today are also different and they different learning goals as a result of the emergence of new technology. Teachers need to adapt their teaching approaches if they are to reach today's learners. Education in the 21st century is challenging, flexible, creative and complex. In addition, it is faced with new emerging problems as well as exciting new possibilities in a rapidly changing world (Gardner, 2008).

In order to acquire the skills required in the 21st century, learning must take place within the context of rigorous academic standards and skills must be taught by engaging learners in authentic, intellectually-challenging work (Cramer, 2007). All learners must acquire highly developed problem-solving, analytical, and communications skills and they must be made aware of the global community in which

they live. Teachers need policies that support problem-solving, analytical, and communications skills (Wilson, 2006). Educational standards must reflect these critical skills as mentioned, while both the curriculum and the assessments must be in line with these 21st century standards. The focus of professional development programmes must be to help teachers to attain these new educational goals. Educational employees must have access to excellent appropriate programmes that support their vision and efforts to provide 21st century education. The physical infrastructure and tools of our schools must be constantly updated to keep pace with the world outside of school (Wilson, 2006).

2.11.3 Domains of knowledge

According to Kereluik, Mishra & Koehler (2011) there are three key domains that must be addressed in a 21st century curriculum, namely, foundational knowledge, meta knowledge and humanistic knowledge.

An analysis conducted by Kereluik et al. (2013) after they received input from 15 reports, books, and articles, led to their conclusion that essential knowledge for the 21st century is a significant contribution to 21st century learning. However, although the way in which knowledge is presented has changed as well as the way in which that knowledge is acted upon, the core roles of teachers have not change. These core roles are to know, to act and to value (see Figure 2.1).

Kereluik et al. (2013) are of the opinion that disciplinary knowledge and domain knowledge are as important as they ever were, irrespective of the rapidly changing technological environment. Teachers need to be well-trained and proficient in their disciplines. The national curriculum advocates critical thinking, problem-solving, communication, creativity and innovation, and collaboration. The focus of learning has always been on deep learning. However what has changed is the access to disciplinary knowledge. Authentic disciplinary inquiry is now possible through technology. It is also important for teachers to know when and how to use technology. Teachers require foundational knowledge in order to apply meta knowledge. Basic digital literacy skills are important in order to integrate technology successfully in the classroom. A key factor for successful lessons is the ability to know how and when to use specific technology for specific subject matter. Interaction across countries is now effortless because of advanced technology and, thus, it is incumbent on teachers to

look at ways to instil emotional awareness, cultural competence and leadership skills in their learners.

2.11.3.1 *Foundational knowledge*

Kereluik et al. (2013) state that foundational knowledge answers the question as to what learners should know. Three subcategories were identified under foundational knowledge, namely, core content knowledge, digital literacy, and cross-disciplinary

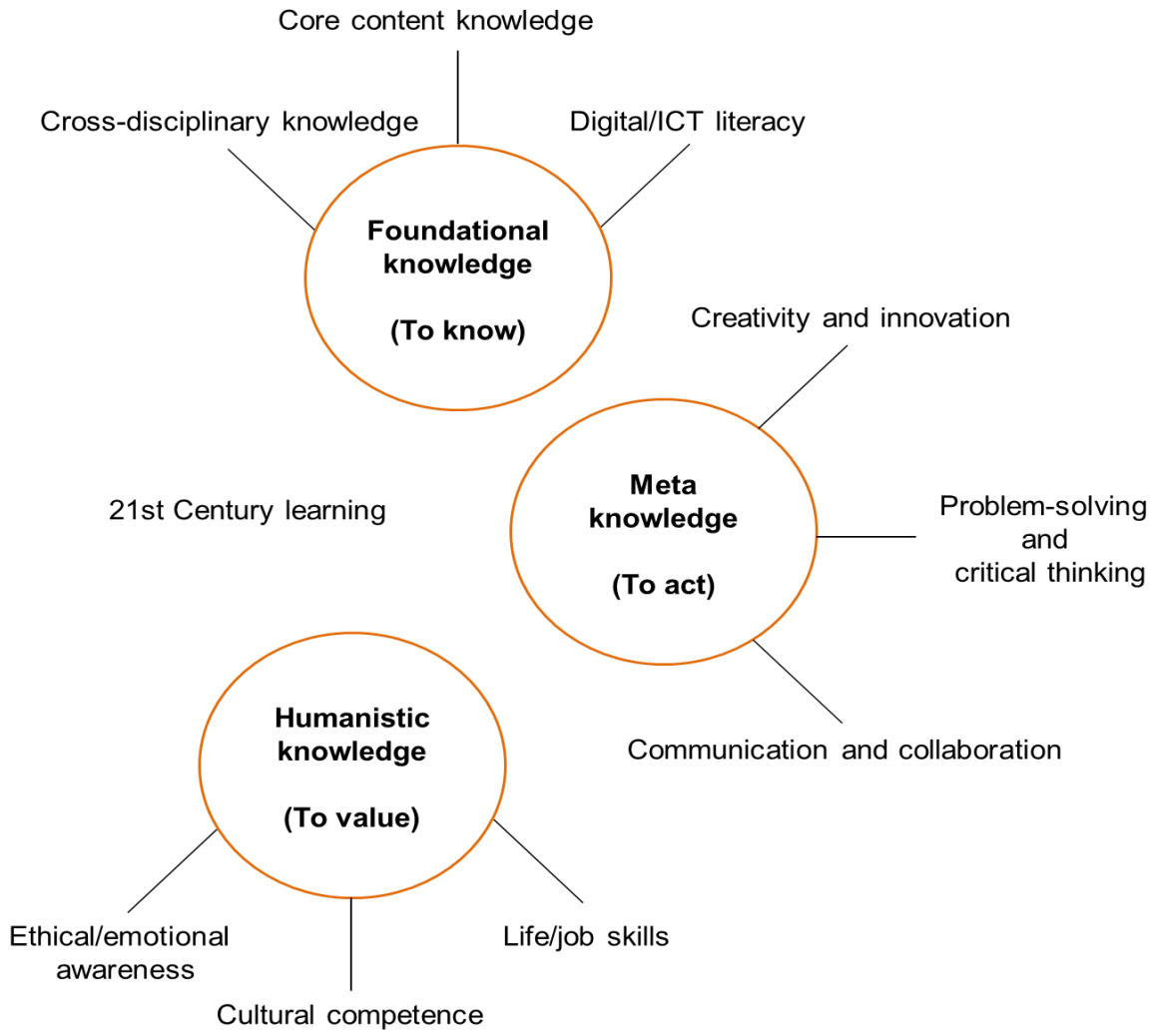

Figure 2.3: Synthesis of 15 different 21st century learning frameworks into one visual image

Source: (Kereluik et al., 2013: 130)

knowledge. The data gathered by Kereluik et al. (2013) highlighted that core contentknowledge and excellence in English and Mathematics constitute the foundations for the development of 21st century skills. Digital and information literacy is often cited as a skill and refers to the research skills which are necessary in order to

find and organise information, and to function fluently in the digital world. It also includes the responsible use of technology and media and the importance of moral and ethical considerations. On the other hand cross-disciplinary knowledge refers to the integration and synthesis of information across different fields. This type of knowledge is considered vital to success in the 21st century because of the amount of information available in this digital age. Synthesis leads to both knowledge construction and the creation of new ideas.

2.11.3.2 *Meta knowledge*

Kereluik et al. (2013) define meta knowledge as the process of working with foundational knowledge. Three subcategories are identified, namely, problem-solving and critical thinking, communication and collaboration, and creativity and innovation. Problem-solving and critical thinking involve the cognitive skills involved in interpreting information and making informed decisions that lead to the effective resolution of problems. Communication and collaboration are cited as essential for 21st century learning in view of the multilingual and diverse population in an increasingly global culture and economy. Employers require the skills that are acquired through collaboration and communication, for example, flexibility, recognition of group and individual efforts and success, as well as a willingness to participate if individuals are to contribute to the success of a company. It is important to articulate oneself clearly, whether orally or in writing, and to be an attentive listener who is open to other solutions that may be considered as out-of-the-box. Creativity is viewed as one of the most important skills that will contribute to success in the 21st century. It involves applying knowledge and skills, evaluating, elaborating and refining products and ideas.

2.11.3.3 *Humanistic knowledge*

According to Kereluik et al. (2013), humanistic knowledge offers a vision of the learner's self and the learner's location in a broader global and social context. Three main subcategories may be identified, namely, life or job skills and leadership, cultural competence, and ethical or emotional awareness. Life skills, job skills and leadership create lifelong learners who will continue to be successful after they have completed their schooling. Such learners effectively manage and organise their own efforts, coordinate and organise information that is relevant and develop relevant solutions to problems. Cultural competence is important because of the increased cultural diversity

as a result of globalisation. The appreciation and acknowledgement of the ideas and emotions of individuals, effective communication and collaboration are all results of cultural competence. Like cultural competence, ethical and emotional awareness is essential for success in the increased culturally diverse, global society. It includes both the ability to put oneself in another person's shoes and the ability to make sound ethical decisions.

2.11.4 Changes in knowledge

The term "knowledge building" in business contexts is equivalent to "knowledge creation". It is associated with intellectual property, intellectual capital, innovation and knowledge work. Knowledge building in educational terms is nothing more than constructivist learning (Scardamalia & Bereiter, 2003). Digital and information technology is not the only change in the foundational knowledge base of education. Access to information and the way in which information is represented have changed tremendously because of the rapid advancements in technology. Digital technologies have changed the way of acquiring, representing, and using knowledge in almost all domains. It is essential that the older generation is aware of and keep up with these changes. Another important aspect is cross-disciplinary knowledge and the ability to synthesise information across disciplines (Kereluik et al., 2013). Knowledge building environments provide opportunities to collaborate to develop new ideas. The challenge is to use the new technologies to enhance knowledge building. Knowledge forums, social media and mobile phones create opportunities for engagement and collaboration. Teachers may use these Web 2.0 technologies for interaction and collaboration in order to create knowledge (Scardamalia & Bereiter, 2003) . The change in meta knowledge means that problem-solving and critical thinking skills are now necessary than before because of the vast amount of information available. Learners need to discern what information is valuable and of quality. As a result of globalisation, ethical and emotional awareness is becoming more critical and an awareness of the differences between people, as well as empathy towards one another, is of vital importance for success in the 21st century.

2.11.5 Knowledge building with Web 2.0 technologies

Current trends in research in education are focusing, inter alia, on mobile learning, wikis and blogs that use technological tools. However, it is important to note that technological tools do not require a specific teaching methodology and the

restructuring of content (Mishra & Koehler, 2006a). In view of the rapid changes in technology, it would be short-sighted to base the 21st century education of today exclusively on technology. There is considerable emphasis in current research on the skills such as creativity, collaboration and innovation rather than on the content itself. However, in order to apply these skills one needs to have a thorough understanding of the discipline in question (Kereluik et al., 2013).

It is important to consult learners during curriculum design. The learners know what their needs and learning styles are. However, the learners' voices must not be the only driver and curriculum design must be based on best practises (Cramer, 2007). Content information on a discipline is widely accessible and valued in the education sphere (Niess, 2011). In addition, Web 2.0 technologies support collective and creative contribution. Any person with internet connectivity may engage in collaborative learning and contribute to content-specific wikis, blogs, chat rooms, and social networks and create videos. Knowledge building and improvements occur during active, online engagement and collaboration. Greater input into a specific problem may open up possible solutions, thus leading to improved and new knowledge. The development of new ideas is the foundation of education (Nelson et al., 2009). Brake (2014) maintains that the purpose of the internet was always that it be a means of production of knowledge and a resource for its users. He states that the two-way flow of information was the original intension of Tim Berners-Lee, the primary inventor of the World Wide Web:

> We ought to be able not only to find any kind of document on the Web, but also to create any kind of document, easily (Berners-Lee, 1999: 82).

Nelson (2008) is of the opinion that teachers with skilled pedagogy will facilitate learners to construct their own knowledge. A deeper understanding of content is the result of active involvement in and engagement with the learning material. Learning becomes meaningful to learners when they co-create and develop their own knowledge. Learners tend to take ownership of their learning when they are given opportunities to interact and engage with content. The knowledge becomes more relevant and meaningful to them, they are naturally motivated, they set their own goals and the evaluate themselves. Web 2.0 technologies are developing higher order skills such as information gathering, evaluation of information, communication, making meaning and evaluating end products.

The focus is no longer on merely reproducing information and content, but on creating and sharing information in virtual environments (Lessig, 2008). “Digital fluency” is a term which is used to describe the ability to use technology. Given the digital environment and the rapid pace of change, it is of vital importance that digital fluency be incorporated into the knowledge required for learners to survive in the 21st century (Lessig, 2008). Kereluik et al. (2013) describe digital fluency as meta knowledge which is needed for the 21st century.

Significant changes in the curriculum are necessary to address the needs of the 21st century. Not only is there a need for the restructuring of the curriculum but also the restructuring of teaching methods and assessment procedures (Dede, 2010, Voogt & Pelgrum, 2005). The majority of frameworks define different approaches to the curricular integration of 21st century skills (Gordon et al., 2009, Voogt & Pareja Roblin, 2012). Dede (2010) and Voogt and Pareja Roblin (2012) proposed the following changes in the curriculum: Firstly, that new content or subjects are added to existing subjects, secondly, the integration of cross-curricular skills and, thirdly, the inclusion of a new curriculum with transformed subjects. In this regard Voogt et al. (2013a) confirm that most frameworks recommend integrating the 21st century skills across the curriculum (Voogt et al., 2013a).

2.11.6 Language education in South Africa

South Africa’s history of language policy and practice in education has been influenced by ideological and political interests instead of pedagogical considerations. Since the 19th century black South Africans have converted English into the language of aspiration, national unity and liberation (Alexander, 2005). Manyike & Lemmer (2014) confirm this fact when they assert that English has become central in the post-apartheid South Africa and it has become the preferred medium of instruction in higher education, commerce and government (referred to in post-1994 policy documents as the language of learning and teaching [LoLT]) in public schools). Nevertheless, equity education in the country is not achieving the desired results as a result of the fact that black learners are learning English as an additional language, but they are expected to master all the other learning areas using English as a medium. Annual reports such as the national school-leaving examinations, literacy and numeracy assessments and international benchmarking assessments all reveal the underachievement of black learners in South Africa (Manyike & Lemmer, 2014).

Manyike & Lemmer (2014) indicate that during the apartheid era (1948–1994), a policy of bilingualism was in place. This policy accorded status to only English and Afrikaans as official languages. Thus, the needs of African speakers were ignored and the policy accommodated white English and Afrikaans speakers only. The medium of instruction in black schools was highly politicised. Although the medium of instruction in the first four years of schooling was in the learners' home language, English and Afrikaans were taught as subjects from the first year of schooling, thus forcing children to be trilingual. By the 1970s English and Afrikaans were used on a 50/50 basis as a medium of instruction while the home language was used for non-examination subjects only. This lowered the status of the home language and demeaned its usefulness. This situation led to the Soweto riots in 1976.

After 1994 the new government went to great lengths to shape the Language in Education Policy (LiEP) (Department of Education, 1997) The Constitution of the Republic of South Africa (South Africa, 1996) gave equal status to all 11 South African languages (English, Afrikaans, Sepedi, Setswana, Sesotho, Tshivenda, Siswati, isiNdebele, isiXhosa, Xitsonga, and isiZulu). The South African Schools Act (Republic of South Africa, 1996) empowered school governing bodies to decide on the language policy while the LiEP (Department of Education, 1997) promoted bilingualism by allowing the home language as a medium of instruction in the early primary schooling, followed by the introduction of additional languages. The Revised National Curriculum Statement (Department of Education, 2002b) stipulates that all learners have to study their home language as well as at least one additional language as language subjects from Grade 1. The Curriculum and Assessment Policy Statements (CAPS) (Department of Basic Education, 2012) reaffirmed this stipulation. It is, thus, the right of all South African learners to be educated in the official language(s) of their choice. Nevertheless, this must be in the context of what is realistically practicable (Coffey & Atkinson, 1996).

In addition, a new linguistically-diverse environment has been created by the desegregation of formerly whites-only schools and innovative ways of teaching are necessary to accommodate multilingualism in schools. South Africa has the most progressive language in education policies which address the issue of multilingualism (Department of Basic Education, 2013).

2.11.6.1 *The national curriculum*

According to the National Curriculum Statement (Department of Basic Education, 2012), the national curriculum is a product which has been designed over a period of 17 years and which aims to transform the curriculum which was aligned with apartheid. The curriculum has been built on the values inspired by the South African Constitution (Act 108 of 1996). The aims of the Constitution are to heal the past and to build a society that is based on social justice, human rights and democratic values. Furthermore, the Constitution aims to improve the quality of life of all South Africans and to give them the freedom to reach their full potential. In addition, the government of the country is based on the will of the people and this is protected by law. One way in which to achieve those aims is through education and curriculum.

Outcomes-Based Education (OBE) was introduced in 1997 to overcome the curricular divisions of the apartheid education system of the past. A new review of the curriculum was prompted in 2000 and led to the *Revised National Curriculum Statement Grades R–9* (Department of Education, 2002b) and the *National Curriculum Statement Grades 10–12* (Department of Education, 2002a). These two curricula have been combined into one document and from 2012 with document being known as the *National Curriculum Statement Grades R–12* (Department of Basic Education, 2012). The new curriculum was built on the previous curriculum and provides a clearer specification of the content and skills which need to be covered on a term-by-term basis.

The National Curriculum Statement (NCS) Grade R–12 (Department of Basic Education, 2012) provides a policy statement for teaching and learning in South Africa. This policy statement is based on high-order thinking skills, social transformation, human rights, environmental and social justice and inclusivity, situated in the context of the rich history and heritage of South Africa (Department of Basic Education, 2012). The NCS Grade R–12 (Department of Basic Education, 2012) aims to produce learners who will be critical and creative thinkers and who will be able to work effectively in teams, organise and manage themselves, collect and critically evaluate information, use science and technology effectively, realise that the world is a set of related systems, and that problem-solving does not exist in isolation (Department of Basic Education, 2012).

2.11.6.2 *First additional language (FAL)*

Learners use their home language which they have already mastered when they first enter school. In Grades 2 and 3 understanding and speaking language-basic interpersonal communication skills are developed (Department of Basic Education, 2012).

The four skills in language include listening, speaking, reading and writing. There is greater focus on these skills in the intermediate and senior phases than in the previous phases. In addition, there is more exposure to the First Additional Language with learners using the language for reading and thinking. They read more and develop their academic cognitive skills. They also use their aesthetic and imaginative abilities in the additional language. It is expected that learners should be reasonable proficient in the First Additional Language by Grade 10. Unfortunately, however, this is not always the case and teachers are being challenged to help learners to meet the required standards in Grade 12 (Department of Basic Education, 2012).

According to the National Curriculum Statement Grade R–12 (Department of Basic Education, 2012), the specific aims in a first additional language include the following: learners must be able to communicate accurately and appropriately; use the additional language for academic learning across the curriculum; listen, speak, to write and present with confidence and enjoyment; think independently and analytically; be able to express their experiences and findings orally and in writing; use the additional language to access and manage information across the curriculum, and become critical and creative thinkers.

The National Curriculum Statement Grade R–12 (Department of Basic Education, 2012) also departs from the traditional approach that learners must first master the basic skills in their home language before they start reading in an additional language. It is expected of teachers to start second-language reading in the middle of Grade 1. Teachers have to clarify the differences between the phonics and sentence structures of the second language and the learners' home language. However, the reality is that the languages are very different and the learners do not have the basics of these languages in place. In addition, the different language areas have different levels of language skills. The benefit of starting with an additional language as early as in Grade 1 is the extent of vocabulary that learners acquire. According to Owen-Smith

(2012), studies have shown that the earlier a learner is exposed to an additional language, the better.

2.12 Summary

This chapter made use of an adapted conceptual framework for the purposes of the literature review examine teaching and learning, emerging technologies and the content knowledge of the 21st century. The TPACK framework and theories on language learning as well as the adapted conceptual theoretical framework were discussed. The chapter then focused on the integration of technology and how the technological changes influence the teacher and the learner before it shifted its focus to the barriers to technology integration. The chapter then examined the development of the national curriculum and, finally, it focused on the various aspects of the content of the curriculum.

Chapter 3 discusses the research design and research methodology used in the study. The chapter all describes how technology was used to gather data required for the purposes of the study and how qualitative instruments were used innovatively via the internet to gather authentic data.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In the previous chapter, a literature study review was undertaken. This literature review covered the findings of previous studies based on the integration of technology in language learning, the TPACK framework, Vygotsky's theory and an adapted conceptual framework. The chapter reported on other research fields that interrogated relevant emerging technologies, teaching and learning and the changes in either content knowledge or the curriculum arising from the digital world in which we live today. Finally, the chapter highlighted technology integration in language learning, the advantages and disadvantages of such integration as the stages in technology integration.

This chapter discusses the research journey that was undertaken to gather and analyse the requisite data in the technologically advanced environment in which this netnographic case study was situated in order to answer the research question. The research question was broken down into the following secondary questions:

- In which ways can computer technology be made relevant for today's 21st century teaching and learning in a multilinguistic language class?
- How are FAL teaching and learning challenged when integrating computer technology in a multilinguistic class?
- How can computer technology be utilised to address every learner's individual learning need?

These questions support the main researcher question, namely, how does computer technology (ICT) promote learning in a multilinguistic language class? According to Creswell (2008), broad, general questions may be addressed by a qualitative study to enable the researcher to learn from the participants. The researcher obtains the views of the participants. The focus of the questions posed is on understanding the process or phenomenon being studied. In this chapter I explain my paradigmatic assumptions and the dual role that I played as both the researcher and the teacher within the context of this qualitative, nethnographic case study. The chapter also includes a comprehensive description of the participants and the data collection instruments. The

choice of data collection instruments was informed by the secondary research questions stated above. The chapter then explains the data analysis process before explaining certain ethical issues and the trustworthiness of the study. Figure 3.1 is a diagrammatical presentation of the research design and research methodology used in the study.

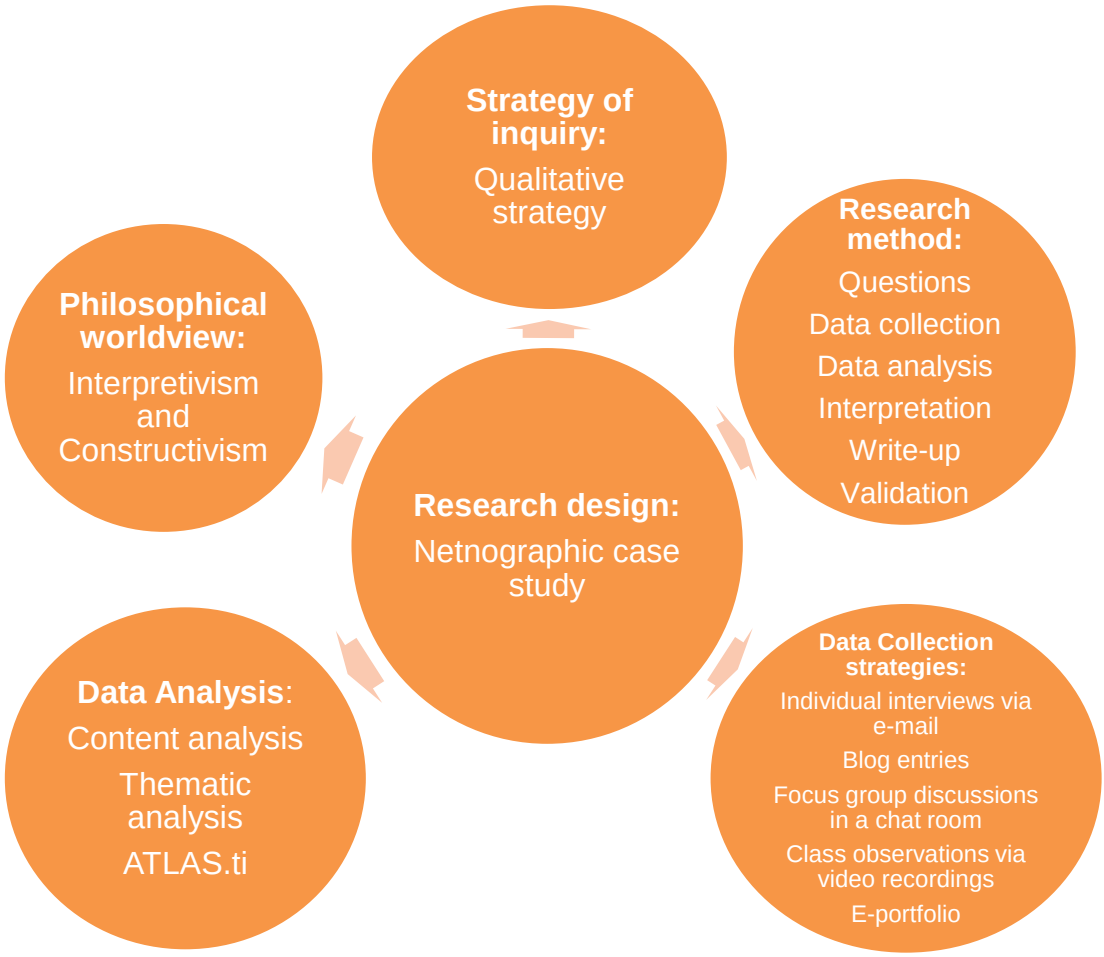

Figure 3.1: Research design and methodology

Source: (w Creswell, 2009: 5)

3.2 Research premise

In answering the questions “How do we know?” (epistemology) and “What is truth or reality?” (ontology), a researcher’s paradigmatic assumptions are being formed. This leads to the formation of his/her worldview or paradigm (Creswell, 2013). Orlikowski & Baroudi (1991) list the following three paradigms that are based on the epistemological assumptions of a researcher, namely, positivist, interpretive and critical. On the other hand, Lincoln & Guba (1985) suggest four underlying paradigms for research, namely, positivism, post-positivism, critical theory and constructivism.

3.2.1 My paradigmatic assumptions

As already mentioned in Chapter one, my study has an interpretive orientation. This orientation opened up opportunities for me to explore and gain an understanding of the learners' meaning making within a technological environment in which learners from different backgrounds, cultures and levels study Afrikaans as a First Additional Language. I am able to identify with Nieuwenhuis (2010: 59) who lists the following assumptions that exist within an interpretivist perspective:

- Human life may only be understood from within.
- Social life is a distinctively human product.
- The human mind is the purposive source or origin of meaning.
- Human behaviour is affected by knowledge of the social world.
- The social world does not "exist" independently of human knowledge.

However, interpretivism goes hand in hand with contructivism. In fact, according to Merriam (1988), the terms interpretivism and constructivism are used interchangeably. Learners come to the school with their own acquired knowledge and interact with both other learners and with technology. Thus, for the purposes of this study, I am embracing constructivism in accordance with the following assumptions underlying constructivism which are listed by Creswell (2009: 8):

- Meanings are constructed by human beings as they engage with the world they are interpreting.
- Humans beings engage with their world and make sense of it based on their historical and social perspectives – we are all born into a world of meaning which is bestowed upon us by our culture.
- The basic generation of meaning is always social, arising in and out of interaction with human community.

Accordingly I position myself within the constructivist-interpretive research paradigm, aligning myself with Friesen (2009) who provides the following four explanations of the reasons why researchers positions themselves within this paradigm: The first reason is that the researcher is either detached or involved in the research; secondly, the researcher recognises that knowledge should be seen as a recalling of feelings and affect; thirdly, the researcher recognises that knowledge should be seen as language and, lastly, the researcher recognises that knowledge should be seen as

communication in a shared environment and atmosphere. Thus, it may be said that I aligned myself with the abovementioned reasons because I was involved in the study as the teacher who believes that knowledge is constructed in the social interaction of learners between themselves and with me. I also believe that learners are engaged in experiences, discussions and activities in terms of which they are challenged to make meaning of their social and physical environments through language and communication.

3.2.2 My dual role as researcher and teacher

According to Henning (2004), the researcher is unequivocally the main instrument in qualitative research because he or she derives meaning from his/her interaction in the investigation. The researcher's role may be either as a complete participant, a participant as an observer or an observer as a participant (Atkinson & Hammersley, 1994). It was not possible for me to be a complete participant in this study because a complete participant does not reveal his/her role as a researcher and participates in the group discussion. Nor could I have been a participant as an observer because I was not merely observing what was happening from the outside but I was actively involved in the study as the teacher interacting with my learners. I was, therefore, an observer as a participant in the study with the clearly defined role of being the researcher but also, simultaneously, the teacher who became part of that which was being observed in order to obtain an insider's perspective. As teacher I designed the technology-integrated lessons, I was actively involved in the chatroom discussions with my class and I facilitated all the internet activities while, as the researcher, I conducted the interviews and focus group discussions and reported on the study. However, I do acknowledge that, because the learners knew me as their Afrikaans FAL teacher and this placed me in an authoritative position in the study, this may have influenced the inquiry.

3.3 Research approach: a qualitative approach

For the purposes of the study, I decided to follow a qualitative approach which, according to Creswell (2009), brings personal value into a study in which where we look at what happens, how it happens and why it happens. In other words, a qualitative study examines the qualities, characteristics or properties of a phenomenon in order to obtain a better understanding of and an explanation for the [phenomenon.

Researchers may choose to follow a qualitative, quantitative or mixed method approach (Creswell, 2009).

Nieuwenhuis (2007a) describes qualitative research as a process of obtaining an understanding of the phenomenon in question through the eyes of the participants and by collecting rich, in-depth data on the participants' subjective experiences and how they construct the social world in their natural environment. Henning (2004) agrees with this view, stating that a clear and detailed account of the actions of the participants, what they think and feel, the setting itself and the significance of signs and symbols in the phenomenon is given in order to obtain a better understanding of our environment and, hopefully, to use this information to bring about social change. Yin (2009) is also of the opinion that the focus of qualitative research is the interaction of the participants with each other and in which reality is socially constructed.

I collaborated with the participants in the study because of my position as a teacher in the school and also because of my passion for helping learners to improve their Afrikaans. I agree with Yin (2009) that the human mind is the source of meaning and that human behaviour is influenced by experiences and knowledge of the social world. I must, therefore, acknowledge that my own knowledge and experiences may have influenced this research study because such knowledge and experiences may have affected the type of questions I asked as well as the research methodology I selected for the purposes of the study.

3.3.1 Research design

Creswell (2009) asserts that the worldview assumptions of the researcher, the choice of strategy and data collection, the data analysis and the data interpretation influence the choice of a research design. In addition, the research problem, the personal experiences of the researcher and the audience of the study must also be taken into account (Creswell, 2009).

This study, which is explorative and descriptive in nature (Yin, 2009), reports on the phenomenon that learners from different backgrounds, cultures and levels of competency in Afrikaans as a First Additional Language have to attain the same outcome, despite these factors. In order to report on this phenomenon, a netnographic case study was selected as the research design. This is discussed in the next section.

3.3.1.1 *Case study*

Despite agreeing that the "case study" is both naturalistic and qualitative, researchers (Stake, 1995, Merriam, 1998, McKay, 2006, Creswell, 2002, Creswell, 2008, Brown & Rogers, 2002) all propose different definitions of the term. Creswell (2008: 486) defines a case study as "an in-depth exploration of a bounded system (e.g., an activity, event, process, or individuals) based on extensive data collection". while Brown and Rogers (2002), Creswell (2002), and McKay (2006) place the case study in the ethnographic tradition. On the other hand, Stake (1995) sees a "case" as an object while Merriam (1998) sees it as a procedure of inquiry.

Nevertheless, in general, the purpose of a case study may be seen as acquiring an in-depth understanding of a case, whether the case is a process, an activity, an event, an individual or several individuals such as learners or teachers (Creswell, 2008). According to Griffee (2012), either a quantitative or a qualitative approach may be applied to case studies. The most popular data collection instruments used in case studies in the educational context include interviews, field logs, tests, participant observations, textbooks as well as documents such as class syllabi, hand-outs, and homework assignments. This research study is an in-depth understanding of a group of girls in Grade 11 and the effect of technology on their learning in an Afrikaans First Additional Language classroom. The purpose of the study is to explore and describe the effect of computer technology in a multilingual language class.

Case study researchers focus on an activity which involves individuals. As such, they are interested in describing the activities of the group in order to gain an in-depth understanding of the case in question (Creswell, 2008). Creswell (2008: 476) distinguishes further between (i) an "intrinsic" case study as a case that is unusual, (ii) an "instrumental" case study in which an issue or theme is studied and (iii) a collective case study where several cases are studied in order to obtain an insight into an issue or theme.

Hine (2005) adds another type of case study to the list and situates the case study of netnography under the umbrella of online ethnography: Online netnography involves observing the naturally occurring "posting" and "threads" in online forum and interviews within an online community. The requisite data may be collected online as well as offline. In view of the fact that the focus of this study was the impact of technology on the learning of learners within an online community I selected this type

of case study as the most appropriate for the purposes of the study. The next section discusses this particular type of case study in greater detail.

3.3.1.2 *Netnography*

Netnography is a very flexible approach and there is also no one accepted way in which netnography should be conducted. Kozinets (1998: 366) initially defined "netnography" as "an interpretive method to investigate the consumer behaviour of cultures and communities present on the Internet", introducing it as an online methodology specifically for marketing and consumer research. However, this online methodology spread to other disciplines such as economics, management and psychology although it is still rare in education (Kulavuz-Onal & Va´squez, 2013). The study of netnography in mega classes was the first research in education in which this methodology was applied (O'Reilly et al., 2007). Jennifer Sandlin used netnography in an educational setting when she investigated the education and learning in informal sites pertaining to consumer education (Sandlin, 2006).

Kozinets (2002) views netnography firstly as a product and, secondly, as a process. The product is seen as the "written account of online cyber-culture", while the process is described as "a new qualitative research methodology that adapts ethnographic research techniques to study the cultures and communities that are emerging through computer-mediated communications" (Kozinets, 2002a: 62). Netnography may, therefore, be seen as the result of the increase in informal communities online. People construct cultures and communities on the internet through computer mediated communication (CMC) technologies. Cultures were previously understood to be geographically bound groups but "geography can no longer be the defining framework for culture" (Boyd, 2009: 27). These online communities open up opportunities to study new types of culture-building and culture-sharing groups and, hence, netnography. I argue that, as a result of the increase in the use of technology in schools, online communities are being formed and are flourishing on the internet. In the context of education learners and their parents may be regarded as the consumers, especially in private schools. It is, thus, essential that schools take a closer look at netnography as a qualitative research methodology to identify the virtual communities that they serve. The purpose of this study is to use netnography to investigate the effect of computer technology on learning in a multilingual class. This

suggests an adaption of Kozinets' netnography methodology to suit an educational setting.

Netnography is a modern version of ethnography with communities and their cultures being studied online. However, it is faster, simpler and less obtrusive than ethnography (O'Reilly et al., 2007). It is also less expensive than focus groups. In addition, it is also extremely beneficial to the data collection and data analysis process because it is possible to retrieve the original data at any time. Kozinets (2002) reported five online communities, namely, independent web pages, e-mail lists, multi-user dungeons, chat rooms and electronic bulletin boards. Kozinets (2000) goes on to say that these virtual communities demand a more focused and relevant research question and are characterised by high "traffic" postings, more interactions between members, more detailed and descriptively rich data and large numbers of discrete message posters.

3.4 Participants

The participants for this study included 19 learners, four First Additional Language teachers and a technician.

3.4.1 Research site

The research was conducted at a private school for girls in Gauteng. The learners and teachers all have their own laptops on which to do schoolwork and research. Each classroom has an interactive white board with internet connectivity available to both the learners and teachers. Certain sites are blocked during school hours for learners as well as teachers. These sites include YouTube and social media sites such as Facebook and Twitter. The school has an IT department which consists of the IT manager, two technicians and the IT teacher. Communication with parents is via e-mail and Communicator (a communications tool developed for schools). Parents are able to view their children's reports online. An Edu admin software program is used for the administration of the school. Thus, the culture of the school is conducive to technology integration while the school management supports teachers who endeavour to provide interesting and innovative lessons using technology.

3.4.2 Learners

As a teacher at the girls' school, I have ready access to the learners because I am responsible for teaching them Afrikaans as a First Additional Language in Grade 11. Accordingly, these learners were a convenient sampling. I wanted to understand, discover and gain insight by gathering rich data. The target audience was the Grade 11 First Additional Language group which consists of 21 girls. Two girls did not want to participate in the study which meant that 19 girls participated in the study. The

Table 3.1: Composition of the learners

Participant	Race	Medium of instruction in		Language		
		pre-primary schooling	primary schooling	used at home	used in social circles	Other languages in order of proficiency
1	White	English	English	English	English	Afrikaans
2	White	English	English	English	English Afrikaans	Afrikaans
3	White	English	English	English/ Portuguese	English	Afrikaans
4	White	English	English	Afrikaans/ English	Afrikaans/ English	French Afrikaans
5	White	English	English	English	English Afrikaans	Afrikaans
6	Mixed	English	English	Southern Sotho	English, Sotho, Tswana	Tswana English Xhosa Afrikaans
7	White	English	English	English	English	Afrikaans
8	Black	Setswana	English	Setswana	English/ Setswana	Sotho English Zulu Afrikaans
9	White	Afrikaans	English	English/ German	English	German Afrikaans
10	White	English	English	English	English	Afrikaans
11	Asian	English	English	English	English	Afrikaans
12	White	English	English	English/ Greek	English	Afrikaans
13	White	English	English	English	English	Afrikaans
14	White	English	English	English	English	Afrikaans
15	White	English	English	English/ Afrikaans	English/ Afrikaans	English/ Afr HL
16	Black	English	English	Shona	English	Zulu English Afrikaans
17	Black	English	English	Ndebele/ English	English	English Afrikaans
18	White	English	English	English	English	Afrikaans
19	White	English	English	English	English	Afrikaans

research focused on the use of technology in an Afrikaans FAL classroom from January 2014 to the end of July 2014. Although all the girls take Afrikaans as a First Additional Language in Grade 11, Afrikaans is not their second language. In fact, in some cases, the learners are able to speak four languages (see Table 3.1).

As indicated in Table 3.1 the class includes diverse learners with different levels of proficiency in Afrikaans. In addition, the learners differ in respect of their backgrounds, cultures, race and the social circles in which they move and interact. Their social circles influence their level of proficiency in Afrikaans FAL.

According to Zhang (2010), second language learning may be acquired by communication in the target language used in social interaction. In addition, the learners also demonstrate different levels of proficiency in their home language, first additional language, second additional language or even third additional language. Some of the learners had been taught in Afrikaans as their home language in pre-primary, primary or high school. Some of them do not, as is expected in the National Curriculum, have a solid foundation in Afrikaans FAL and they do not have the required vocabulary or foundation for the desired level of proficiency of Afrikaans in grade 8. The learners enter the Grade 8 FAL class with different levels of pre knowledge because they all come from different primary schools with different standards of curriculum delivery. Thus, teachers face the challenge of accommodating these different levels and they are required to take this account in their teaching in order to help them to achieve the required learning outcomes.

3.4.3 First Additional Language teachers and the technician

I decided to conduct focus group discussions in a chat room with the First Additional Language teachers and the technician because I believed they would be able to shed some light on sub-research questions 1 and 2, namely, the influence of the integration of relevant computer technologies on teaching and learning in a multilinguistic language class and the learners' perceptions of the effective use of computer technology in a multilinguistic language class. These teachers have all taught at the school since the school incorporated technology into the curriculum. The three Afrikaans First Additional Language teachers, the one Sepedi First Additional Language teacher and the technician also all worked in the same school environment and were able to answer the questions on the relevant technology in the First Additional Language classrooms, the challenges that we face with the integration of

technology as well as the potential use of technology to address individual needs of the learners (see Table 3.2).The technician's input was valuable for the subquestions on the emerging technologies as well as the circumstances which are beneficial for effective technology integration.

Table 3.2: Composition of the focus group discussion – First Additional Language teachers and technician

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Technician
Position held at the school	Teacher	Teacher	Subject Head: Sepedi	Deputy-Principal	Information Technology Specialist
Teaching					
Subject at the school	Afrikaans FAL	Afrikaans FAL	Sepedi FAL	Afrikaans FAL	Information and communications Technician
Experience (years)	18	7	30	30	8
Experience at the school (years)	9	7	10	9	8
Qualifications	BEd (Hons)	B Ed	MA in African Languages	MA Languages	A+ N+ MCSC
Main specialisation subjects	Afrikaans English Mathematics History	Afrikaans	Sepedi	Afrikaans, Zulu	N/A
First Additional Language teaching experience (years)	16	7	30	30	N/A
Experience in teaching with technology (years)	9	7	13	9	N/A

The teachers are all highly qualified, extremely experienced and experts in their subjects. These teachers were essential in my study in providing knowledge of the content and pedagogy of the TPACK Framework. They also brought with them their experiences as they had all been involved in the initial integration of technology in the school. For the purposes of confidentiality I referred to these teachers as teacher 1, 2, 3 and 4 and I used the term technician to distinguish between the teachers and the technician. I had decided to include a technician because the focus of the inquiry was on the integration of technology. I referred to myself as the Researcher in the transcriptions of the focus group discussions. With the exception of teacher 3 who is a

Sepedi FAL teacher, all the other teachers were in the Afrikaans Department. The teachers provided valuable input into the study, particularly in the focus group discussions.

3.5 Data collection

According to Creswell (2008: 55), the data collection in qualitative research includes the use of general, applicable questions to generate responses from the participants, the gathering of texts or images or the use of a small number of individuals or sites in order to collect the information. The case study in this investigation included both a non-empirical component and an empirical component.

A comprehensive literature review was provided in Chapter 2 to cover the non-empirical component. As has already been stated in Chapter 1, the school is an advanced technological school with advanced technological learners. Thus, the empirical component of the study included anonymous online discussions in a blog on the part of the learners, observations of the learners when they were engaging in the online-discussions, class observations via video recordings, semi-structured interviews with the learners via email, focus group discussions with the teachers and the Information and Communications technician in a chat room and the written texts of the learners which had been uploaded on the Turnitin software program in an e-portfolio as well as the learner's individual progress on Turnitin as the primary data.

The electronic way in which the data was collected was influenced heavily by the main research question, namely, the effect of computer technology on language learning in a multilingual class. The data collection instruments were qualitative instruments and the data was collected in the participants' own setting. Being situated in a technological advanced school environment, I explored the use of the internet and used anonymous blogs, semi-structured interviews with the learners via email, e-portfolios of the learners, class observations via video recordings and focus group discussions with First Additional Language teachers in a chat room. The blog meant that the learners felt free to express themselves in a safe environment while they also had sufficient time in which to construct their thoughts and expressions. It was convenient for the learners and teachers to write in their own time because of a lack of time to conduct 19 interviews face-to-face as well as conduct the focus group

discussions as one of the teachers is the deputy-principal and, therefore, extremely busy.

The instruments chosen for the purposes of the study were chosen specifically to address the research question and, especially the sub-questions (see Table 3.3).

Table 3.3: Data collection instruments in relation to the research questions and unit of analysis

Question	Data-collection instrument	Population	Unit of analysis
In which ways can computer technology be made relevant for today's 21st century teaching and learning in a multilinguistic language class?	Individual interviews via e-mail	Learners	19 Grade 11 girls
	Blogs	Learners	19 Grade 11 girls
	Focus group discussion in chat room	Teachers and technician	Four teachers and the technician
	Class observations	Learners	19 Grade 11 girls
How are FAL teaching and learning challenged when integrating computer technology in a multilinguistic class?	Individual interviews via e-mail	Learners	19 Grade 11 girls
	Blogs	Learners	19 Grade 11 girls
	Focus group discussion in chat room	Teachers and technician	Four teachers and the technician
	Class observations	Learners	19 Grade 11 girls
How can computer technology be utilised to address every learner's individual learning need?	Individual interviews via e-mail	Learners	19 Grade 11 girls
	Blogs	Learners	19 Grade 11 girls
	e-portfolio	Learners	19 Grade 11 girls
	Focus group discussion in chat room	Teachers and technician	Four teachers and the technician
	Class observations	Learners	19 Grade 11 girls

The unit of analysis comprised 19 girls in Grade 11 in the Afrikaans First Additional Language Class, First Additional Language teachers and the technician. The texts of the 19 learners used in the blog served as the source of a large amount of data in the study. These online interactions were used to answer the research questions.

There are two types of data collection which may be done using netnography. Firstly, there is the written communications between the participants in the online setting and, secondly, the researcher's field notes taken during class observations during which he or she observes, describes, reflects, and analyses what he or she has observed during the research process (Kozinets, 2000). The data was compiled from the blogs of the learners, the semi-structured interviews and the field notes of the researcher. I

was familiar with the language of the educational setting and the technology. It must also be noted that the learners used social posting (Kozinets, 2002) and, although the data from the social posting was not used for the purposes of analysis, it did contribute to more interaction between the learners. In this regard, O'Reilly et al. (2007) list the following three types of postings, namely, relational, transformational or student knowledge sharing. According to O'Reilly et al. (2007), relational posting involves the learners interacting but the interaction is irrelevant in relation to the class work. Transformational posting is involved one learner tries to change another learner's behaviour while student knowledge sharing involves the learners discussing class work. In this study knowledge sharing was the most frequent and was used during the data collection process. A description of each data instrument used follows in the next section.

3.5.1 Blogs

According to Huffaker (2005), a blog is a personal journal that is made up of chronological entries via the internet and which presents various opportunities for presenting and expressing oneself online. No sophisticated technical knowledge is required for the instant publishing of text or graphics on the internet. The features of a blog include the archiving of past blog posts by date, hyperlinks to other bloggers and opportunities to provide comments or feedback to people (Herring, Scheidt, Kouper & Wright, 2007), Cameron & Anderson (2006) consider a blog as an online diary with the blog developing naturally into a platform for self-disclosure. It is especially valuable for the self-reflection and expressions that address personal problems related to learning. It has been found that adolescents make up a large proportion of the community of bloggers. Perseus Development Corporation found that 51,5% of all blogs are created and maintained by children aged 13 to 19 (Herring et al., 2007). Another similar study (Huffaker, 2005) found that that 40,4% of blog authors are under the age of 20. One of the most popular blog-hosted websites, the Livejournal.com, claims that the largest distribution of blog authors is 20 years and younger (Huffaker, 2005).

I chose to investigate the online discussions of the learners in the Afrikaans FAL Grade 11 blog. This blog is provided by blogkids as shown in Figure 3.2.

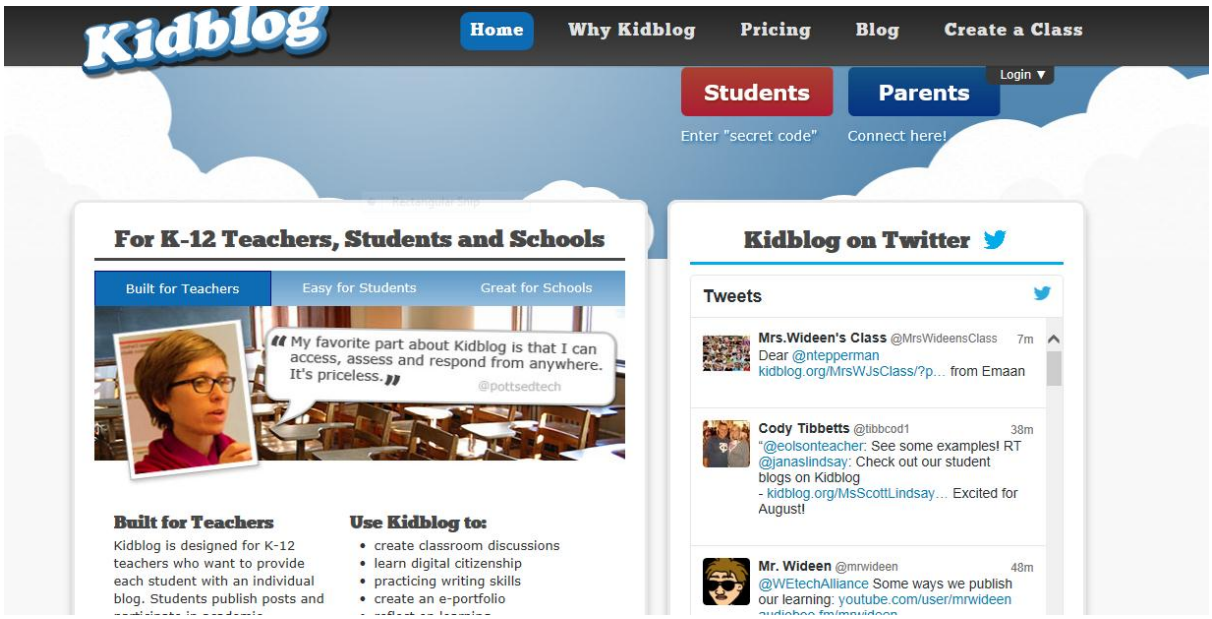

Figure 3.2: Kidblog

My learners use internet applications such as Facebook and Twitter to communicate directly, inexpensively and conveniently and without any time or place restrictions (Warschauer & Ware, 2006). Fotos & Browne (2004) list the advantages of such applications as intrinsic motivation, autonomy of learning, provision of authentic material and communication with real life audiences. According to Eastment (2005) blogs offer opportunities to practise writing, give learners a sense of ownership, provide learners with a sense of an audience, furnish them with feedback on their writing process and promote and optimise teacher-learner communication and peer interaction.

Using the blog was an excellent convenient way of promoting interaction between classmates, interaction between the learners and me, and interaction between the learner and outside readers who were interested in the blog (Liou & Peng, 2009). Blogs may also help learners to improve their language use by commenting, correcting and providing assistance on the blog. It is, thus, possible for teaching to be extended beyond the classroom by using blogs. Studies (Liou & Peng, 2009, Eastment, 2005) have revealed that learners in a blog improved their writing content and it is, therefore, an excellent way in which to provide a target audience for the language learner who has the classroom and the teacher only as support.

The blogs used in this study had the same format as a diary and provided a platform for self-expression and creativity. In addition, the blog was also extremely user-friendly

and easy to implement. The learners were able to access their blogs anywhere and anytime as long as an internet connection was available. In addition, blogs are both individualistic and collaborative (Huffaker, 2005). It was important, however, to ensure that the learners (IT technicians offering technical support) were properly trained to work on the blog.

3.5.2 E-portfolios

3.5.2.1 *Turnitin software*

Jones (2008) describes Turnitin as an anti-plagiarism software program that was developed in 1994 and that is used extensively in tertiary institutions to detect whether a student has committed plagiarism or not. Approximately 85 countries worldwide (Davis, 2007) use Turnitin as a plagiarism detection tool. It is recognised as a tried and trusted system and is seen as the global leader in the electronic plagiarism detection field. In addition, it is reported that over 80% of universities in the United Kingdom as well as a number of high schools and further education colleges are using it. Turnitin was developed by iParadigms LLC and offers one solution to the growing plagiarism problem on the internet. Documents may be uploaded onto the Turnitin website and are then compared with billions of internet documents. These internet documents include an archived copy of the internet, a database of certain periodicals, a local database of submitted student papers, on-line publications and journals. The Turnitin software then highlights all the exact words of the authors of these internet documents. Turnitin generates an originality report for each document that is submitted to Turnitin. Turnitin looks for matches of eight to 10 words between the uploaded document and the previously mentioned internet documents. The Turnitin software ignores commonly used words in the uploaded document. A percentage of matches are then estimated. However, it is essential that academics are aware that Turnitin is not an automatic tool and that it is the academic who makes the final judgment on plagiarism (Jones, 2008).

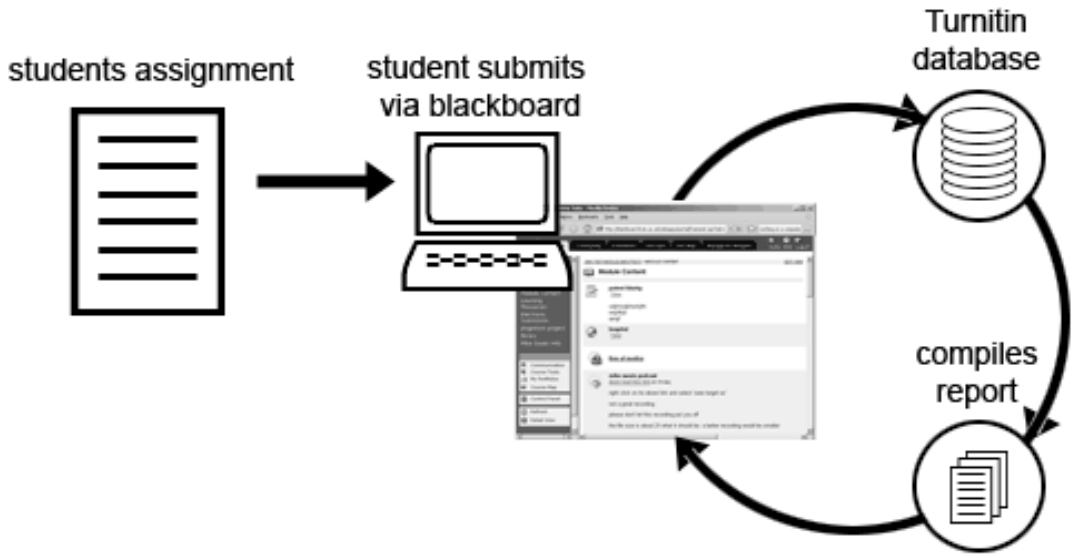

Figure 3.3: Representation of how Turnitin works (Jones, 2008: 2)

Turnitin may also be of value in improving the writing of students: According to Jones (2008) Turnitin is an electronic text-matching tool which enables students to upload their assignments onto the Turnitin website. Turnitin was used in this case study to track the progress of the learners' writing in the Afrikaans First Additional Language classroom.

Another valuable contribution of Turnitin in this case study was that an e-portfolio was automatically generated as the learners uploaded their individual assignments. Learners were able to track their sentence and word structure mistakes as well as their mistakes in punctuation. A full description of the mistake is given in the quick mark comment build in Turnitin (see Addendum A). As the teacher I wanted the learners to use Turnitin to help them to become more independent and advanced writers. The learners were required to correct their own writing problems and to ask questions on the discussion forum available on Turnitin. This meant that their questions could be answered individually, using technology in order to address the individual needs of the learners in the class.

The learners were encouraged to communicate in Afrikaans but they also had permission to ask questions in English if they were not able to express themselves in Afrikaans. The other learners were able to read all the comments on the discussion board and learn from the mistakes of others. One of the benefits of this technology is that all the information are available on the laptops, thus making it easy and

convenient to access files while the learners do not have to carry their study guides to school every day. I used to start the lesson by explaining the marking code and the different colours for the word structure, sentence structure and punctuation mistakes. I then stressed the fact that the sunny yellow colour indicates outstanding writing. Both a written individual comment and an audio comment were available for each learner, thus making differentiation possible with the aid of technology. The learners used ear phones so as not to disturb the other learners, thus promoting individual learning. My aim was for learners to learn from their mistakes and to prevent them from making the same mistakes again. The learners had access to the explanation of the relevant rule in the quick mark comment and the discussion board which enabled them to learn from the mistakes of other learners' mistakes as well as receiving help and support from me via the discussion board.

3.5.2.2 *Assignments uploaded on Turnitin*

All the assignments counted towards the marks that formed part of the learners' marks for the term and also towards their continuous assessment marks. This motivated the learners to upload their assignments and to strive to do their best. Writing is also a time-consuming process and, thus, the learners benefited by using Turnitin for their writing. Table 3.4 presents a list of the assignments and the activities involved in each assignment that were uploaded onto Turnitin:

Table 3.4: E-portfolio assignments

Week	Learning task	Other activity
1	Curriculum vitae	May upload a picture of themselves on their curriculum vitae
2	First draft of essay	Learners write the first draft of their essay and upload it on Turnitin.
3	Final draft of essay	Learners receive their first draft back. The word, sentence structure and punctuation mistakes were identified by the teacher using the quick mark comments on Turnitin. The comments were formulated by the teacher. The learners correct the mistakes and upload the final draft of the essay.
4	Dialogue	The learners write a dialogue, choosing their own topics. The learners upload their dialogue on Turnitin.
5	Correction of mistakes	The learners are expected to learn from their mistakes. They correct their mistakes using the First Additional Language study guide, cell phones for looking up the spelling or the Afrikaans word and use the discussion board either to ask for help or to learn from the other learners' mistakes.
6	Final transactional writing piece: e-mail.	The learners write an e-mail for an assessment mark

The learners' first assignment was to design a curriculum vitae (CV) for themselves. This served as a short transactional piece of writing only to enable the learners to accustom themselves to Turnitin.

The second assignment was more challenging than the first and was an essay. The essay was written as process writing. Process writing involves the learners being given more than one opportunity to write a creative piece. As the teacher and facilitator I identified and showed learners the mistakes they had made without correcting the mistakes for them. The learners received the feedback back from me and then, guided by my individual feedback, they tried to correct their own mistakes. Then, if necessary, their peers helped some of the learners to correct their mistakes. When an error was identified, I scaffolded the learner to correct it in a contingent manner; offering just enough assistance to guide the learner to examine his or her own mistake, recognise it and correct it. The aim of this process was to enable the learner to assume responsibility for her own learning, to make a conscious decision to help herself and, thus, to assume autonomy in the learning process. The learners then uploaded their final, corrected essays for assessment. Finally they were asked to write comments of their experience of Turnitin on the blog. These comments were used as data for the purpose of the study.

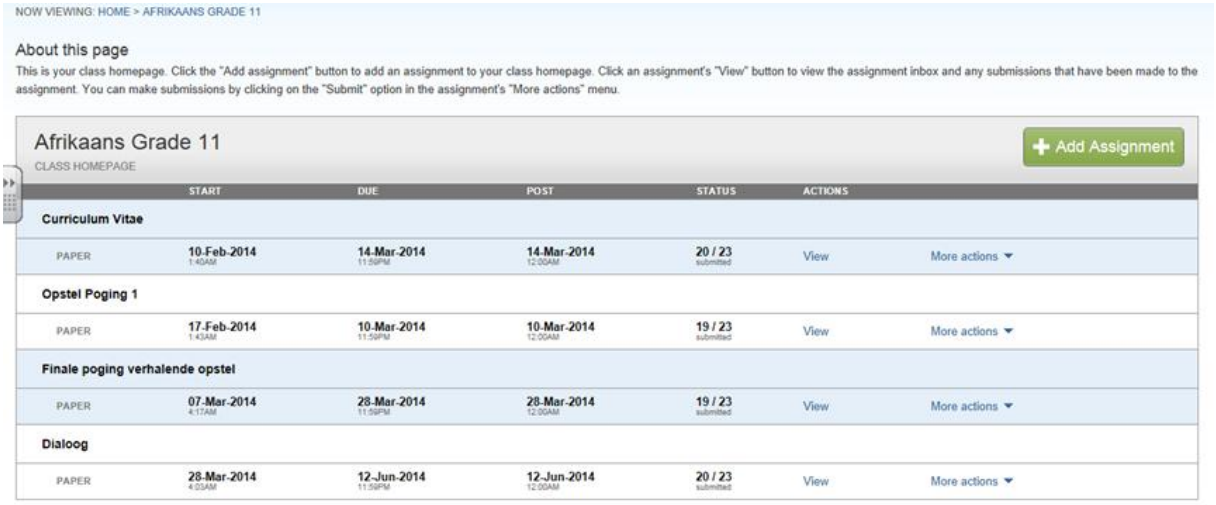

Figure 3.4: Turnitin

The third assignment was a dialogue. Learners were given the opportunity to choose their own topics, thus allowing them to take responsibility for their learning and in order to encourage creativity. Figure 3.4 depicts a typical e-portfolio from a learner while

Figure 3.5 presents an example of an assignment which had been marked using quick mark comments:

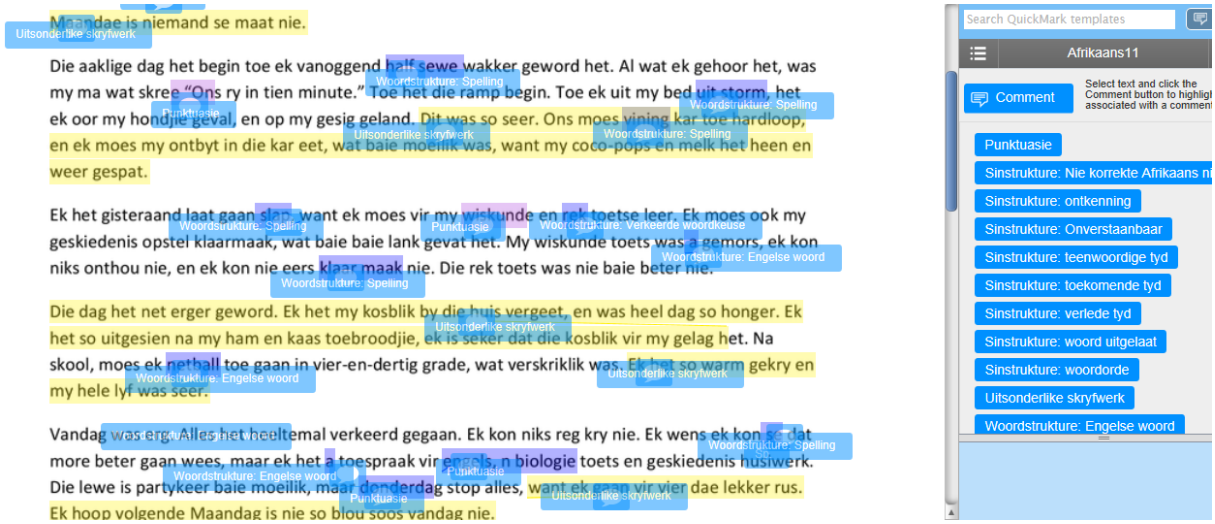

Figure 3.5: Example of an assignment marked using the quick mark comments

3.5.3 Classroom observations

"Successful observation requires something more than just sitting and watching" (Lynch, 1996: 108).

Lynch (1996) provides the following classification for observation: Observation may be classified into education, applied linguistics, evaluation, and anthropology. Lynch (1996) further notes that, in education, research is often conducted into the curriculum; in anthropology, people are observed in their natural settings; applied linguistics refers to observation from the perspective of research into the classroom while evaluation refers to the educational programmes are observed, including programmes such as government programmes, drug treatment programmes and business training programmes. An advantage of observation is that it provides the researcher with a "you-are-there" point of view (Patton, 1990: 203). It is essential that research observation is intentional, systematic and theoretical. The observation which was used as a data collection instrument in this study was based on the research question, the theoretical framework and the area of interest of the study.

Either the researcher's own class or that of a colleague may be observed, but Lynch (1996) warns that the time available in which to observe and to record may be limited if the class is the researcher's own class. In the main, learners do not feel threatened when the observation is conducted by their teacher (Fradd & McGee, 1994: 43).

Rossi, Freeman & Lipsey (1999) agree that unobstructive observation makes it possible for the researcher to observe the programme directly "in order to focus on areas of interest" (Fradd & McGee, 1994: 43). The items for observation may be described as either open or closed. When the items are open, this means that the items the researcher is looking for are not specified and, when closed, it means all the items that the researcher is looking for are listed on an observation sheet (Lynch, 1996).

As the researcher, I observed and collected field notes from the online discussions from the beginning of June 2014 until the end of July 2014 in a classroom in which learners were busy blogging or where I was integrating technology in the lessons. It was an open observation because the items I was looking for were not specified. This research was exploratory and the data gathered was qualitative (Griffee, 2012).

Of the 11 possible observation techniques (audio recording, checklist, hand-held digital recorder, in-class observation notes, peer observation, proformas, scribbles, seating chart, structured observation, teacher diary, video recording), I chose to use three, namely, in-class observation notes, unstructured observation and video recording.

Altogether five lessons were video recorded during which I integrated technology in an FAL classroom with 19 learners. The learners were at ease with being video recorded as the teachers occasionally video record class activities for the school's website. Different emerging technologies were used in all the lessons. As I was a participant observer who knows the learners very well, I was actively involved in the lessons and made field notes during the class (see Addendum) from the blog and from the video recordings. The video recordings of the lessons were directly uploaded as primary documents to ATLAS.ti. The use of video recordings as data had the added advantage that I could watch the lesson over and over in order to pay close attention to the social and interactive learning.

3.5.4 Semi-structured interviews

Nunan (1992: 231) describes an interview as "the elicitation of data by one person from another through person-to-person encounters", while Kvale (1996: 6) states that an interview is "a conversation that has a structure and purpose", and Cohen, Manion & Morrison (2000: 279) define an interview as a "social, interpersonal encounter, not

merely a data collection exercise" and which must have purpose, structure and form. Thus, an interview may be regarded as a structured conversation between one person and another person with the aim of eliciting information. For the purposes of this study I conducted semi-structured interviews with the learners. The initial questions (see Addendum G) were broad questions and the responses to these questions informed the subsequent questions as the study progressed (Creswell, 2008:56). The learners were, as expected, very comfortable to respond via e-mail because that is the channel of communication that is used in the school. I then moved to three questions that relate to their current level of computer proficiency. All of the 19 learners were interviewed, but one of the 19 learners did not respond to all the e-mails despite several attempts to contact her. After questioning her in person, I have learned that she does not have access to the internet at home. All 19 individual interviews can be viewed in the hermeneutic unit as primary documents. The individual interviews were copied and pasted in one document for each learner. These documents were given back to the 19 learners to member-check as a measure of trustworthiness. It was then uploaded onto ATLAS.ti for the analysis.

These interviews were conducted via e-mail for three reasons. Firstly, the learners were extremely busy with their academic work and sport activities. They were able to participate in the e-mail interview at a convenient time in a comfortable, relaxed environment. Secondly, in view of the fact that I taught the learners, it is possible that they would have been extremely nervous if they were interviewed face-to-face. Lastly, this approach gave the learners sufficient time to organise their thoughts and think carefully about the questions before answering them. They were in a calm, safe environment and were able to structure their thoughts accordingly. They had enough time to think about their answers and how to formulate such questions to facilitate clear encoding and decoding of information.

Kimmons (2014) notes the huge changes in the socialising aspect of society because of social media. The digital learners engage more in written communication than oral communication while learners are expressing their emotions and feelings more freely on social media than they may previously have done. It is second nature to them to text in order to communicate.

3.5.5 Focus group discussions

Kitzinger (1994) define a focus group discussion as a carefully planned discussion which is designed specifically to ascertain the participants' perceptions of a research problem in an environment that is both accepting and non-threatening.

The reason why I decided to use focus group discussions was because I wished to access the views of the teachers that were situated in the same setting as the participants in the case study (Bloor, 2001). In addition, a focus group discussion provides a means to a better understanding of how people feel about an issue, product or a service (De Vos, Strydom, Fouchè & Delport, 2011). The focus group discussion provided me with more information on the effect of technology on learning in a first additional language classroom and, specifically, information on the relevant technologies available, the benefits of technology integration and whether individual learning was being promoted with the aid of technology in a first additional language classroom.

Scholars (Nieuwenhuis, 2007b, Nieuwenhuis, 2007a, De Vos et al., 2011, Creswell, 2009) agree that it is essential that the participants in a focus group are carefully selected to ensure purposive sampling and also that it is not necessary that they are representative of a specific population. According to Nieuwenhuis (2010), a focus group discussion is an in-depth group interview that provides a platform on which the participants may build on each other's ideas and comments in a way that is not possible in individual interviews. Cohen, Manion & Morrison (2007) confirm that, in a focus group discussion, a collective rather than an individual view is obtained while the participants feel more relaxed than they would during individual interviews.

I created a chat room, https://todaysmeet.com/TEGNOLOGIE, for teachers teaching in the same setting as the learners in the study, and for the one technology specialist who worked closely with the teachers and learners regarding the integration of technology. The technology specialist's input was especially valuable with regard to sub-questions 1 and 2. The data from the focus group discussion was copied and pasted directly into ATLAS.ti. This meant that no member checking was necessary because there had been no transcribing of the data. This also enhanced the trustworthiness and reliability of the study.

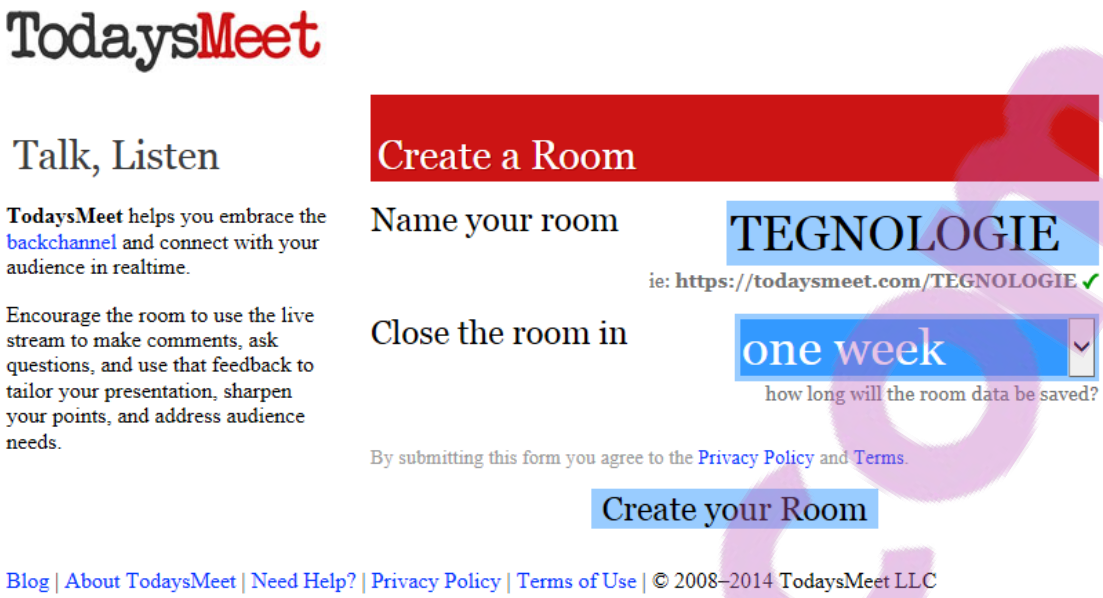

Figure 3.6: Chat room for the focus group discussion

3.6 Analysis of the data

The analysis of the data was inductive, thus involving a development from particular to general themes.

3.6.1 Analysis process

Creswell (2008) describes the analysis of the data as creating the bigger picture of the inquiry by converting the "thin description" (the "raw", empirical information) into a "thick description" that is coherent and which presents more than just facts and empirical content but interprets the empirical information in the light of other empirical information from the same study and from the conceptual framework that frame the study. Thus, the data analysis consists of text analysis that describes the themes in the study under investigation while the data is interpreted by looking at the bigger picture. Strydom & Delport (2005: 315) define data analysis as "the process of bringing order, structure and meaning to the mass of collected data" while the qualitative scholar Merriam (1998: 178), states that data analysis is the "process of making sense and meaning from the data that constitute the finding of the study". In line with this thinking, Nieuwenhuis (2010) explains that data analysis involves making the data more manageable by organising the data which has been collected in order to facilitate the search for important and relevant information. For the purposes of this qualitative case study the data analysis was primarily an inductive process. The data collection and the data analysis took place simultaneously in order to ensure a

coherent interpretation of the data (Mcmillan & Schumacher, 2001). The data analysis resulted in a description of the views of the learners and the teachers on the effect of computer technology on learning in a multilinguistic language class with specific themes emerging from the research findings. A comparison of the research findings with the findings from existing research was conducted while new information learnt from the research study were discussed. Qualitative researchers tend to bring themselves into the written report by writing about their experiences during the research (Creswell, 2008).

Analysis using ATLAS.ti 7

I used ATLAS.ti to transcribe and analyse the data from the discussions on the blog, interviews with learners via e-mail, classroom observations via video recordings and the netnographic focus group discussion in the chat room which I had created for First Additional Language teachers. Although the chat room was available for a month the teachers participated in two focus group discussions only. They also shared their knowledge of teaching with technology in a First Additional Language classroom. These teachers taught in the same environment as I did in my teaching of the Grade 11 class in the case study. The blog discussions of the learners were monitored from the beginning of June 2014 until the end of July 2014. The data was then transferred into ATLAS.ti. Themes were identified and explored in order to answer the main research question as to whether computer technology (ICT) promotes learning in a multilingual language class.

I attended two training workshops on ATLAS.ti, one in 2013 and one in 2014, in order to improve the quality of my data analysis. Atlas.ti is a powerful workbench for qualitative data analysis with texts being analysed and interpreted using coding (Smit, 2002). Atlas.ti was extremely helpful because it also enables the coding of videos. I selected and coded portions of the time lines in the video recordings. ATLAS.ti contains tools that provide visual images of relationships between categories, keeps all the datasets together in one hermeneutic unit while incorporating them into each other, enhances an intuitive approach and supports a discovery-oriented approach (Gibbs, 2006a).

Before describing how ATLAS.ti was employed in this inquiry, the main concepts and their meanings are explained:

- The hermeneutic unit (HU) is be regarded as the “intelligent container” (Friese, 2013) which keeps track of all the data.
- The primary documents/texts (PD/PT) represent the “raw” data such as text documents (transcripts of interviews, articles, reports), recordings (interviews, broadcasts, music), video clips (audio-visual material e.g. lessons), PDF files (papers, brochures, reports), and geo data which refers to the locative data obtained from using Google Earth (Friese, 2013).
- Quotations may be seen as the transparent layer on top of a document. A quotation consists of the identifier (a number) and a pair of coordinates that specify the beginning and end of the quotation (Friese, 2013).
- A code refers to “most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (Saldana, 2009). Coding is the basis of the data analysis process (Friese, 2013). There are five ways of coding in Atlasti.7, namely, Open coding, code by list, in-vivo coding, coding with drag & drop and automatic coding (Friese, 2013).
- Families are clusters of codes that are grouped together to form an idea. This makes it easier to handle the information than may otherwise have been the case (Friese, 2013).
- Relations linked codes meaningfully with each other.
- Memos are the researcher’s thoughts regarding the text and are useful for creating theory. A memo is similar to a code, but contains longer passages of text than a code.
- Comments are detailed explanations of the codes.
- A network view provides a visual diagram of the relationships formed between codes, quotations, and memos. It conceptualises the structure by connecting sets of similar elements together in a visual diagram (Friese, 2013).

The data analysis in this netnographic case study was primarily an inductive process where the data was coded, using open coding and in-vivo-coding. Lewis, Thornhill & Saunders (2007) describe *open coding* as a selction of text from a name of a term to ensure the clarity of meaning. *In-vivo* coding is when the actual words used by the participants is used for coding.

The data analysed transpired during the blog reflections, e-mail interviews, focus group discussions and classroom observations. The aforementioned documents are the primary documents and were uploaded into the hermeneutic unit of ATLAS.Ti. as explained. Quotations were used to support reportings and these notions, for example, (P5:6) in which P5 means primary document number five and six means the number of that particular response. Thus (P5:6) means primary document five, response number six. The participants' names were not revealed for the sake of confidentiality. However, the participants were each assigned a number to keep track of them. I instructed the learners to use pseudonyms for the blogs because of the public domain and also to ensure that the learners give their honest opinions. They had to feel free to voice their opinions and reflections on the technology-integrated lessons. The teachers' identities were also protected and the teachers were numbered in order to keep track of their responses.

Stages in the analysis process

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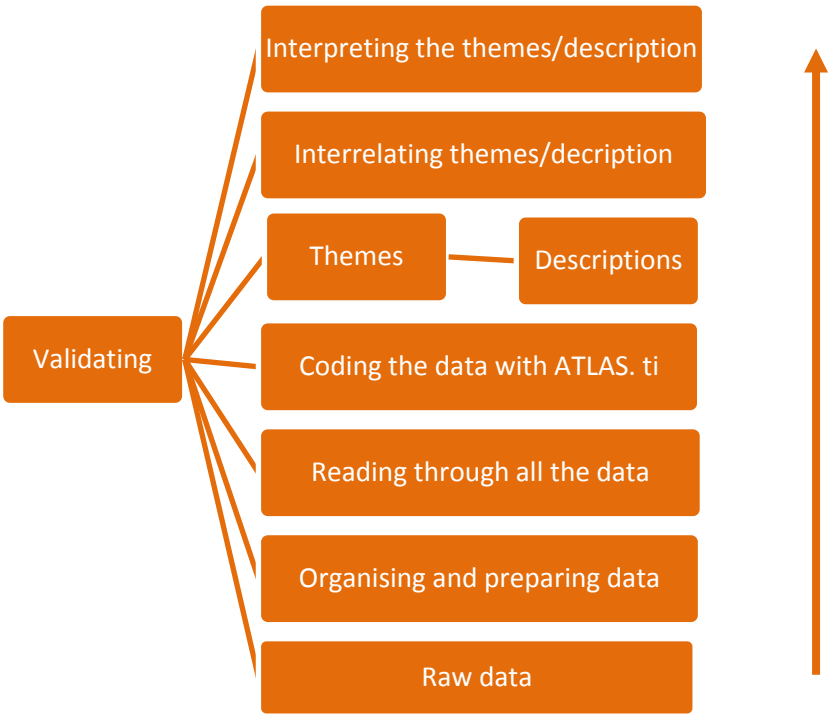


Figure 3.7: Steps in the data analysis process (Creswell, 2009: 185)

The diagram above depicts the various stages of the analysis process. Although process appears as a linear, hierarchical approach, in practice, it was very much interrelated as well as iterative

Step 1 involved preparing and organising the data. This meant transcribing the interviews and focus group discussions, scanning documents and organising the data according to the sources of information. Fortunately, most of the data in this case study required little or no transcribing because of the netnographic research method which was used. Step 2 involved merely reading through the data in order to obtain a sense of the data. It was also necessary to reflect on the overall meaning of the data at this stage in order to ascertain the tone and the depth of the information. Step 3 involved the coding process. Saldana (2009) describes a code as a word or a short phrase that captures the primary essence of data. Despite the fact that a code must summarise or condense the data, the researcher must be extremely careful not to reduce the data. Creswell (2007) noted that the researcher's approach to the study as well as the researcher's ontological, epistemological and methodological stance, all influence the coding decisions. Figure 3.6 illustrates the initial coding for the interviews and how the data became saturated with no new codes emerging.

Figure 3.8: Saturation of the data

Step 4 involved the description of the setting and the participants and also the themes. Before the themes were identified, the codes were grouped together to form categories. Saldana (2009) noted that looking for patterns in terms of which to categorise the data may be done by finding similarities, differences, frequencies, sequences, correspondences and causations in respect of the data. Main categories

are compared to each other while the "reality" of the data is transformed into the thematic, the conceptual and the theoretical. As illustrated in Figure 3.9 the codifying process is a streamlined process. The themes emerged as the main findings during the coding process. Step 5 involved the representation of the description of the inquiry and themes. This representation may be a discussion of the events in chronological order or a discussion of the themes with the aid of visuals, drawings, labels and tables. Step 6 involved the interpretation of the data and the lessons learnt by the researcher (Creswell, 2007).

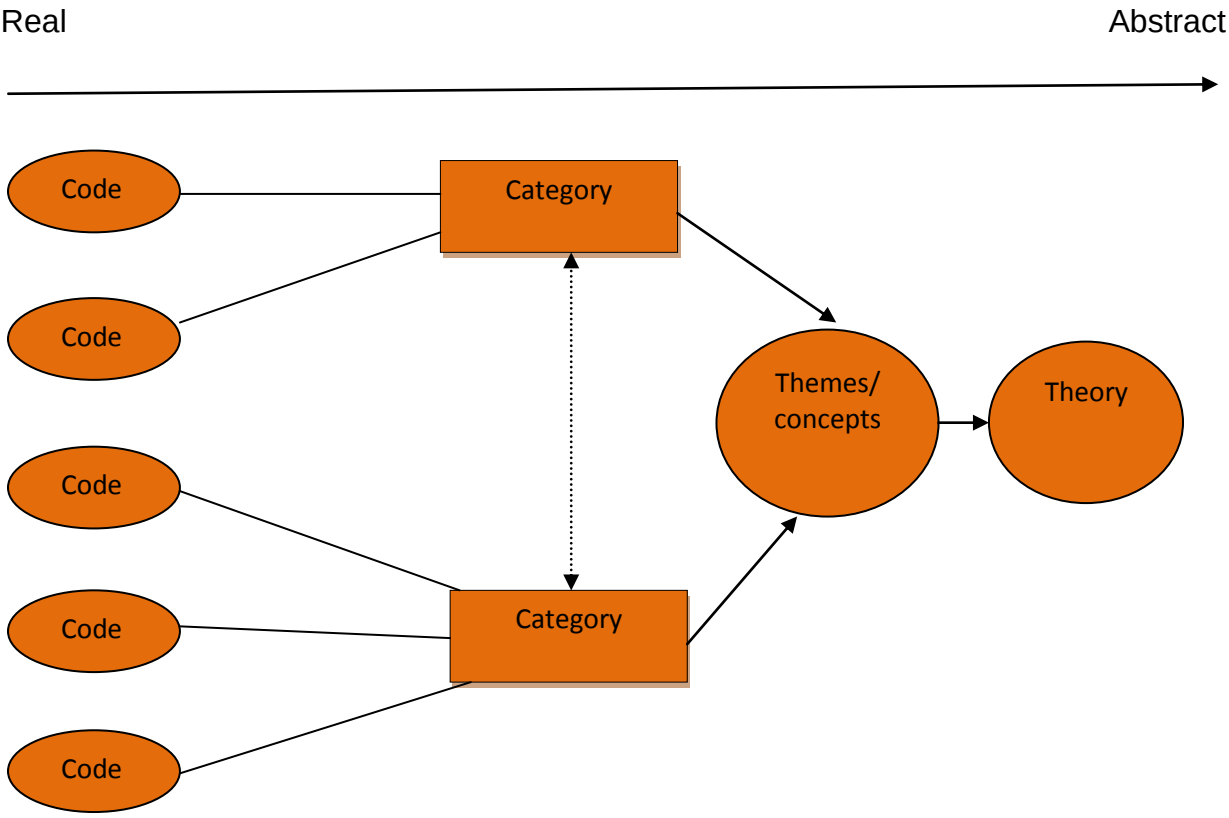


Figure 3.9: A streamlined code-to-theory model for qualitative inquiry (Saldana, 2009: 12)

3.6.2 Content analysis

Content analysis involves the analysis of items such as books, written documents, brochures as well as the transcripts of focus group discussions or interviews (Nieuwenhuis, 2007b). For the purposes of this study I made use of content analysis in respect of the transcripts of the blog entries, the interview scripts, field notes from observations and the focus group discussions in the chat room.

3.6.3 Thematic analysis

According to Braun & Clarke (2006), thematic analysis refers to the identification, analysis and reporting of patterns or themes. Braun & Clarke (2006) go on to say that thematic analysis is an extremely flexible approach. The thematic analysis in this study involved the following activities: Firstly, I had to familiarise myself with the data. I then generated the initial codes, looked for common themes, reviewed and redefined the themes and, finally, I named the themes. The thematic analysis was also indicative of the way in which the learners constructed reality. The themes emerged from the data. The data collection process and the data analysis process took place simultaneously with the researcher moving backwards and forwards between the notes, research literature, posts, transcripts and memos. The literature study formed part of the analysis process to explain the emerging themes. The data collection and data analysis continued until the data was saturated (see Figure 3.8) and no new issues emerged (Niewenhuis, 2007b).

3.7 Trustworthiness

3.7.1 Trustworthiness and reliability

The postings of comments are a social act and all the posted comments constituted relevant, observational data. This data may be regarded as extremely trustworthy because it was not transcribed as was the case with the data arising from the interviews. It was “raw” data that was copied as it was and pasted into ATLAS.ti. The data gathered, the data analysis and the findings were handled in the same way as data would have been handled in conversational analysis. Once the findings had emerged, they were “triangulated” (see 3.7.3). This means that the trustworthiness of these findings was tested by comparing them to secondary data and confirming the results with experts, other teachers or learners (Bartl, Hück & Ruppert, 2009). Netnography is an established social science method of research. However, as researcher, I had to be conscious throughout the netnographic data gathering and analysis processes that it was the content of the community’s communicative acts that was being analysed and not the content of the individuals’ acts (Kozinets, 2000).

I applied conventional procedures such as member checks to ensure that the research was trustworthy and reliable. Conversations in netnography occur in written text form through computer-mediation. The limitations of the medium and technique were

reflected in the conclusions drawn (Kozinets, 2000). In addition, netnography has the distinctive advantage that I could, at any time during the research process, return to the original, qualitative data set (O'Reilly et al., 2007).

The qualitative data was electronically saved and transcribed. Member checks ensured that the information was verified by the participants. Feedback, additional information and information exchange was ensured by member checking (O'Reilly et al., 2007).

3.7.2 Trustworthiness in coding and interpretation

Friese (2013) points out that coding form the basis of the qualitative data-analysis process. One way to ensure trustworthiness in coding is the use of multiple coders. Nieuwenhuis (2010) describes inter-coder reliability as the extent of consistency between different coders, while intra-coder reliability on the other hand is the extent of consistency within a single idea. I have ensured coding consistency during my analysis by using intercoding when I did co-coding with a knowledgeable researcher in the field of Education Sciences.

3.7.3 Crystallisation and triangulation

According to Patton (1990), triangulation refers to the use of a combination of methodologies by researchers to validate the data collection instruments. I used multiple methods of data collection such as observation, online text and semi-structured interviews with learners to triangulate my findings and, thus, to ensure both trustworthiness and reliability. There are four kinds of triangulation, namely, (i) methods triangulation, (ii) analyst triangulation, (iii) triangulation of sources and (iv) theory/perspective triangulation (Patton, 1990). However, Richardson (1997) regards triangulation as too rigid for use in qualitative studies, maintaining that crystallisation provides a more dynamic and deeper understanding of the phenomenon because of the endless variety of dimensions and angles of approaches. Richardson (2000) proposes a shift from seeing something as a fixed rigid two-dimensional object to a crystal with infinite variety of shape, substance, multi-dimensionalities, transmutations and angles of approach. I used in addition to all the different data collection instruments statistical analysis of the errors the learners made in their e-potfolios, in order to use crystallisation to obtain a deeper understanding of the phenomenon.

3.8 Ethical issues

Kozinets (2002) states that, when researchers engage in netnography, they must explain the research, disclose their presence, obtain informed consent to use the participants' direct quotations in the thesis, make sure that they obtain feedback from the participants and also ensure the confidentiality and anonymity of the participants.

I obtained ethical clearance to conduct the study from both the school and the university. The participants were informed orally about the aim and nature of the study as well as their involvement in the study. In addition, an information letter describing the nature and intent of the study and their involvement in the study (see Appendices D-F) was given to the learners and their parents as well as the teachers. The parents provided formal consent with the understanding that learners' confidentiality would be respected and they would be free to withdraw from the study at any time during the research process. I ensured that the data collection process was non-threatening, transparent and trustworthy. I also established trust in the relationship between the participants and myself as the researcher. In order to ensure the trustworthiness and reliability of the data, it was vital to maintain the natural scene in order to obtain authentic data. The confidentiality and anonymity of the participants were emphasised with the learners using pseudonyms in the blog to protect their identities.

3.9 Summary

This chapter presented an overview of the research design and research methodology used in the study. Accordingly, I firstly acknowledged the premises on which I based this inquiry and explained my role as researcher as well as my paradigmatic assumptions which had informed the constructivist-interpretive research paradigm in terms of which this study was conducted. This was followed by a discussion of the netnographic, case study, research design. The next section described the population and sampling and included a table containing the data of the learners and teachers who participated in the study. The data collection instruments used were discussed, the data analysis process was described, the trustworthiness of the study explained and certain ethical issues expanded upon.

The next chapter presents and discusses the emerging themes pertaining to the effect of technology on language learning in a multilingual classroom. The coding process is detailed and the concepts and categories that emerged are discussed. The empirical

data is analysed in the light of the non-empirical data, the data is conceptualised and synthesised and the theoretical framework, as discussed in the literature study contained in Chapter 2, explained.

CHAPTER 4

DATA REPORTING AND ANALYSIS

4.1 Introduction

Chapter 3 gave a detailed description of the methods used to gather the empirical data, as well as the reasons for employing these methods in this investigation. The chapter also provided a description of the data-collection instruments, the data analysis, the role played by the researcher, the participants, the research and the ethical considerations. The primary sources of data comprised the semi-structured e-mail interviews with the 19 learners, the learners' reflections on their experiences of the integration of technology recorded on the blog, the focus group discussions with the four First Additional Language (FAL) teachers and the technician in the chatroom, the observations obtained from the video recordings and the field notes, as well as the learners' e-portfolios.

Chapter 4 reports on the findings of the research and the interpretations of the data that were gathered; these are supported by the theory discussed in Chapter 2. Firstly, Chapter 4 reports on the participants' experiences of the integration of technology in a multilinguistic language class and their responses to these experiences. Furthermore, it sheds light on the similarities and differences between the learners' perceptions and those of the teachers in order to obtain a deeper understanding of the data. The analysis focuses on the different data-collection strategies and the categories that emerged from an analysis of the data obtained. Secondly, a representation of the themes that emerged from the inquiry, and a discussion thereof in terms of the existing literature, is presented. The correlations and discrepancies in the findings mirrored in the existing literature in this field are then discussed.

I will now report on the results of the first four data-collection strategies to shed light on this phenomenon using the lenses of the learners and the views of the four FAL teachers and the technician. The results as they relate to the e-portfolios will be discussed in Chapter 5.

4.1.1 Analysis of the electronic data

The data collected were analysed in order to answer the primary research question:

- How does computer technology influence First Additional Language teaching and learning in a multilinguistic class?

As an introduction to this chapter, I include Table 4.1 which summarises the five themes, categories and codes that transpired from this inquiry. The main themes that emerged from the data are *a century characterised by fast-moving technological innovations, the integration of technology into teaching and learning in the digital era, speed and ease of technology, transformation of teaching and learning and employment of specific technologies to address the individual needs of learners.*

Table 4.1: Analysis of the data

Codes	Categories	Themes
Access information critically, become creative, boring becomes more interested, interesting lessons, different experience, enjoy technology, eco-friendly, motivation, positive experience, form own opinion, helps with plagiarism, improve interactive skills, know, understand and appreciate other cultures, motivation, multitasking, multiliteracies, plan, design, execute and evaluate solutions, produce authentic products with real-world applications, read critically, think and reason logically, use information accurately and creatively	New century skills	Theme 1: A century characterised by fast-moving technological innovations
21st century skills, prepare learners for the digital era, grew up with technology, digital writing, social media, adjust and adapt to the changing environment, become curious about the world, communicate using imagery, digital literacy, peer pressure, platform for expression, school requirement to use technology, social bullying, social media, Turnitin, write persuasively	Digital era	
Available technologies, direction for the future, emerging technologies, encouragement, excellent technological skills, exciting to learn new things, IT lessons at school, keep up to date with new technologies, relevant technologies, technicians for support, technology use out of school, optimal use of technology, beneficial, computer lessons at an early stage, does not improve Afrikaans ability, important, learners' resources, more computer training, more software programs, need more Afrikaans websites, need more in depth training in software, need more training in technical skills, training in hardware, user friendly and very advantageous.	Technologies	Theme 2: The integration of technology into teaching and learning in the digital era

Codes	Categories	Themes
Passionate technologically skilled teachers, positive attitude, Internet access, good technical skills, culture of technology, condition of the laptop, good resources, classroom management, administrative staff for support, computer lessons at an early stage, digital literacy, good resources for the implementation of technology, knowledgeable teachers, more plugs available, more young teachers that understand technology, safe secure environment, small classes, start small and progress in time with the implementation of technology, technology not working properly	Favourable conditions for technology integration	
Cause stress, distraction, lose work, technology not working properly, become careless, do not evaluate information critically and competently, hinders performance, lose quality of handwriting, negative online material, no longer personal, not much flexibility, prefer books, scared to asks questions, scared to make mistakes, struggle with technology, time consuming, too many sources available, viruses	Challenges with technology integration	
Accelerating of the tempo of work, helpful, makes learning easier, easy to make notes, neat presentation of work, easy to identify and correct mistakes, and makes communication easier, easier to capture corrections, easier for essay writing, focused, give a word count, mobility, PowerPoint slides help with study, submission of work, tasks are easier, multitasking, quick identification of mistakes, complete the tasks much quicker and work improvement.	Easier with technology	Theme 3: Speed and ease of technology
Faster approach, saves time, submission of work is easier and easy translation of English to Afrikaans.	Faster approach	
Available resources, easy access to information, timely access to information and makes research easier	Easy and timely access to information	
Work is authentic, enhance teaching, improve teaching and learning, scaffolding of information, the teacher is a facilitator, communication in real life, real-life situations and technology integrated activities	Teaching instruction	Theme 4: Transformation of teaching and learning
Better understanding of the work, more efficient, work improvement, better quality, more confidence, more organised, learn more with technology, relaxed class atmosphere, improve reading skills, makes learning easier, need more vocabulary, remember the work better, writing by hand improves concentration	Effective learning	
Collaboration, interactive learning, interaction with other learners, interaction with the teacher, learn from other people, interactive lesson, learn from other people's mistakes, learn from the internet, learn more about online conversations, less face-to-face communication, support from stronger learners, support from the teacher and work in teams with others.	interaction and collaboration	

Codes	Categories	Themes
Evaluate information critically and competently, extension of knowledge, independent learning, individual feedback, individual learning and take responsibility of their own learning	Individual learning	Theme 5: Employment of specific technologies to address the individual needs of learners
Assessment, easy to correct mistakes, easy to identify the mistakes, feedback is more effective, individual feedback and learn from your own mistakes	Feedback	
Audio is helpful, learn by doing it yourself, visual learning is helpful and work from the known to the unknown, audio visual learning and voice recording	Different learning styles	

As mentioned in Chapter 1, this inquiry was contextualised according to two sociolinguistic realities. Firstly, Golonka et al. (2014b) highlight the technological sphere and the need for teachers to engage with technology. I will now discuss the technological sphere and the integration of technology into the FAL class. Secondly, technology opens doors for language learning because of the exposure to the target language and the opportunities it offers for interaction in the target language. The value of technology integration in language learning, as mentioned by Chapelle (2009) will be discussed.

This study comprised a netnographic case study and most of the empirical data were gathered electronically via the internet from the following sources:

- a focus group discussion with four FAL teachers and a technician
- semi-structured interviews with 19 learners conducted by e-mail
- the learners' reflections recorded in a blog
- class observations recorded on video
- learners' e-portfolios accessed via the Internet.

4.2 Presentation of the findings

The findings were recorded by, firstly, reporting on the data-collection strategies separately in order to obtain a deeper insight into both the learners' perspectives and the teachers' perspectives. As meaning unfolds, the existing literature is interwoven with the data that were collected and this consequently confirms Kelly's (2004) statement that the interpretation process is continuous and accelerates as one writes up the research report.

The data that were collected during data gathering were supplemented by the theoretical data discussed in Chapter 2. The data-collection process was done iteratively, moving backward and forward between data gathering and data analysis. I will now discuss the findings obtained from the different data-collection strategies.

4.3 Technological knowledge

In the discussion of the following data collection instrument, the focus group discussions, I explain the teachers' views about TK in the FAL classroom.

4.3.1 Focus group discussions with the teachers

I chose to conduct focus group discussions online in a chatroom with both the FAL teachers and a technician because they were the people who could help to shed light on research sub-questions 1 and 2, that is, the *influence of the integration of relevant computer technologies on teaching and learning in a multilinguistic language class* and *the learners' perception of the effective use of computer technology in a multilinguistic language class*.

Table 4.2 shows how many times each code was allocated to a category. Two categories stood out in the teachers' discussions. They were: *technologies* (35 codes) and *favourable conditions for technologies* (25 codes). Other categories that emanated from the focus group discussions were *digital era* (20 codes) and *new century skills* (19 codes)

Table 4.2: Categories that emerged from the focus group discussions

Technological knowledge (TK)	**Codes**
Technologies	35
Favourable conditions for technology integration	25
Digital era	20
New century	19
Faster approach	3
Easy and timely access to information	4
Easier with technology	5

4.3.1.1 *Technologies*

The teachers embraced the integration of technology in the classroom. Teacher 3 was very keen on integrating technology in her lessons and reported that she used the Smart board interactively with iPads, laptops, the intranet and the internet. In addition,

she reported that she used Voki characters at the beginning of the lesson to draw learners' attention and interest, as suggested by Golonka et al. (2014b). The teachers mentioned that the learners used technology to support their prepared speeches and also for research for their creative writing. Teachers were of the opinion that technology promotes creativity and innovation. The teachers explained that the learners used their cell phones when they struggled with internet connection. It would seem that the teachers had realised the importance of adapting to the technological changes in the environment, as stated below:

> I use the Smart board interactively with iPads, laptops, intranet and the internet. (P21:28)

> I also use the DVDs as well as the learners' cell phones when the internet is down. The audio devices are also used when necessary. (P21:16)

According to the teachers, the learners enjoyed doing tasks and projects that require research on YouTube, as they found them exciting and fun. YouTube is a website that they enjoy and they spend a lot of time on this website. The use of this method means that doing schoolwork becomes fun and learners become motivated as suggested by (Cramer, 2007) that increased motivation and more learner-centred learning are the results of authentic instruction. Scardamalia & Bereiter (2003) agree that active engagement with content leads to self-confidence because learners take ownership of their own learning.

The teachers found education technology easy to work with and stated that it encouraged learners to be creative and innovative. Other advantages reported by the teachers were increased communication and self-directed learning. One teacher said about technology:

> I would recommend it anytime because it is always easy to work with and it encourages learners to be creative and innovative. (P21:53)

The teachers made use of the Learning Management System to post worksheets, messages and reminders, as well as for some small class tests. Golonka et al. (2014) note that the Learning Management System promotes the interaction of multiple learners and is a platform on which teachers are able to organise course content efficiently. They reported that, by using this system, the teacher becomes the

facilitator and guides the learners in their learning. The teachers used the Smart board for PowerPoint presentations and to play DVDs, and the audio devices to promote listening skills. The teachers also noted that their attitude towards the integration of technology was an important factor in the success of technology implementation. Furthermore, they believed that technology motivates the learners and, in language learning, enhances a more positive attitude towards the target language (Golonka et al., 2014). On the question of whether they would recommend technology integration to other schools, all the teachers answered in the affirmative.

The teachers reported that the use of audio, with devices such as CDs, DVDs and YouTube clips, helped with pronunciation, which is very important when learning an additional language. In addition, social media provided ample opportunities for collaborative learning and knowledge building. Knowledge building in collaborative environments equals knowledge creation, as it promotes social interaction among peers, which is beneficial for learning (Vygotsky, 1978) and collective intelligence (Nelson et al., 2009). Furthermore, in collaborative environments solutions to complex problems can be generated and such environments are generally also natural and relaxed and can be used by teachers for language acquisition (Krashen, 1982).

Lastly, the teachers reported that electronic tests on the intranet made marking and immediate feedback easier. It is important that learners are introduced to e-tests at school, as more and more institutions of higher learning are using electronic assessments, or e-assessments, because of the growing student enrolment (Brink & Lautenbach, 2011). One of the teachers wrote:

> It really helps with the marking and immediate feedback to the learner and teacher. (P21:76)

According to Graff (2004), any assessment completed with the aid of technology is an electronic assessment. However, it is important to note that the same principles apply to e-assessment as traditional assessment (Benson, 2003).

The next section explores the teachers' views on favourable conditions for the successful integration of technology.

4.3.1.2 *Favourable conditions for technology*

The teachers reported that the digital fluency of learners influences the effect of technology on the learners' learning. The teachers reported that they regard the technical skills of the learners as very good, as reflected in the following statement:

> The fact that our learners are digital, makes it easier for them to develop more interest in their learning. (P21:14)

Lessig (2008) emphasises the importance of digital fluency for the knowledge and skills needed for learners to survive in the 21st century. The integration of emerging technologies develops learners' interest in learning because they are working with devices that they enjoy.

The teachers at the school researched view their own technical skills as high and reported that the ICDL courses offered by the school helped their digital fluency. Teacher 3 commented:

> My technical skills are excellent and are improving daily as I use them in my teaching. I did all the ICDL modules, which helped a lot. (P21:19)

The teachers also mentioned that the use of technology improves if the teachers actively engaged with the technology, as does digital fluency.

As in the case of the learners, the teachers complained about the internet access and stated that the technicians sometimes found it difficult to help everyone. Golonka et al. (2014a) consider technology not working properly to be one of the frustrating challenges that teachers and learners face with the integration of technology. This is reflected in the following statement:

> I sometimes find that the inconsistency in the connectivity delays the progress in the lesson and sometimes one does not achieve one's goal. (P21:34)

The teachers agreed that a reliable internet connection was very important as it was needed for conducting research.

The teachers attended courses offered by the Information Technology Department at the school in order to stay updated on the latest technology innovations in teaching. This is supported by (Niess, 2011). The teachers wrote in this regard:

> As a teacher I also try to stay abreast by attending all the training and software workshops. (P21:96)

> I try to keep myself in the loop by using all the available technology apps that I come in contact with just to make sure that I don't miss out. (P21:98)

The teachers reported that sufficient financial resources were a key component in the implementation of technology. Owing to the fact that technology is developing at a rapid pace, schools need to plan adequately for the financial resources needed to remain up to date with the latest education technologies. The teachers further reported that laptops need to be updated constantly with the latest software.

The following section discusses the digital era and its effect on the integration of technology in the FAL class.

4.3.1.3 *The digital era*

Angeli and Valanides (2009) note that teachers are under pressure to integrate technology into lessons because of the rapid technological changes taking place in the environment. Valdez et al. (2000) identify three stages in the technology integration process. The school in which this research was conducted is considered to be in stage 3 of this process. Stage 1 refers to the mere add-on of technologies, while stage 2 refers to situations where the internet is practically only used for research and to engage in conversation with people all over the world. Stage 3 is characterised by authentic instruction based on an individualised and personalised approach.

The teacher participants acknowledged the need to possess 21st century skills in order to survive in this digital ecology and, in addition, to meet the needs of learners and be effective in class. The teachers were of the opinion that such 21st century skills were being addressed in class and the learners were applying them without realising that they were using such skills. Accordingly, teachers must design activities that develop these skills. According to Annetta (2010), teachers are in the best position to investigate the potential of technology in order to reach pedagogic goals. Consequently, they need to adapt to the changes in the technological sphere and

constantly reflect on the relevancy of their teaching practice. The focus of their professional development should be on how to guide learners to become self-directed learners. The teachers in this study were aware of their role in this digital era which is reflected in the comment below:

> Teachers need to design activities for learners to become creative and problem-solving thinker. (P21:91)

The learning environment and the pedagogical culture of the school must be based on a partnership between the learner and the teacher, where learners take ownership of their learning in a collaborative learning environment (Gordon et al., 2009). Learners in the 21st century pose a challenge to teachers because they were born into a digital world. Moreover, they are racially and ethnically diverse, are highly competitive and prefer group work and collaboration. Teachers need to reflect constantly on the needs of the 21st century and to adapt their teaching and learning in order to equip learners to be fully functional members of society.

In this section the focus of the teachers in their responses was on the 21st century learner and how the teacher should adapt to accommodate their needs. Teachers are therefore expected to remain up to date on the latest educational technologies and provide opportunities for authentic instruction and assessment. Authentic instruction and assessment result in the building of new knowledge, discussions about real-life problems and the development of problem-solving skills.

4.3.1.4 *New century skills*

Cramer (2007) notes that authentic instruction and assessment results in learners finding, evaluating and organising information. The skills acquired with authentic instruction and assessment include critical thinking skills, how to work collaboratively in teams, the creation of high-quality products that can be used outside the classroom and how to communicate with one another. Learners learn 21st century skills by actively engaging with digital resources every day.

On the question of the new 21st century skills, the teachers responded that these skills were needed to address the needs of the 21st century learner. On the question of whether these skills were being addressed in the classroom, the teachers responded in the affirmative. The teachers reported that learners were applying these

skills without really realising that they were doing so. This coincides with Cramer (2007) opinion that technology is used as a tool to acquire 21st century skills.

Owing to the fact that the school in this study is multilingual and multiracial, learners and teachers get to know, understand and appreciate other cultures and are able to adjust and adapt to changing environments. According to Wankel (2011a), social media provides a platform for collaboration, learning, interaction and co-creation that can lead to improved teaching and learning. The teachers maintained that the integration of technology in the classroom enhances creativity, innovation and communication in the school, since the learners were using most of their technology devices in learning and research. The teachers were also using social media extensively.

Teacher 3 participated in a WhatsApp group which not only enhanced communication between the learners but also between the teacher and the learners. The teachers reported that the learners did their own research and had developed the skills to sift and evaluate information before they use it. The teacher wrote:

> Learners are able to do their own research whereby they develop the skills to sift and evaluate information before they use it. (P21:88)

The integration of technology and research-related assignments enables learners to develop higher order thinking skills with ease. The teacher as facilitator needs to design activities for learners that develop their creativity and their problem-solving skills.

The teachers enjoyed the integration of technology in lessons, stating that the classroom environment had become more interesting and interactive with the introduction of technology, as reflected in the statement below:

> The environment in the Afrikaans class becomes more interesting and interactive with technology. (P21:66)

When using technology it is important that it is applicable to the lesson; it should be fun but also effective in reaching pedagogical goals (Mishra & Koehler, 2006b). Teachers should design technology integrated activities that are fun, creative and enjoyable to the learners. An example of a technology integrated part of the curriculum is film study. The teachers observed that the learners enjoyed film study. The teachers

believed that technology was an important motivator because it forms part of learners' lives in this new century. This concurs with what Golonka et al. (2014b) assert, that is, that the most important benefit of the use of technology in a second language is the increase in learners' motivation and interest, which are key components for success in learning a second language. It has been found that learners use technology readily and thrive on it.

Teacher 3 reported that technology provided opportunities to challenge the above-average learners and to maintain their interest in the target language. The teacher wrote:

> It also gives "stronger" learners the opportunity to stretch themselves and to keep their interest. (P21:43)

This notion concurs with that of Brownlee-Conyers (1996), who maintains that active engagement with technology leads to higher-order thinking skills.

In the next section I will discuss the learners' responses on their technological knowledge (TK) in the FAL class which transpired from the data collection instruments.

4.3.2 Semi-structured interviews via e-mail

Table 4.3 shows the categories that emerged from the interviews with learners in order of their salience: *technologies* (197 codes), *new century skills* (160 codes), *favourable conditions for technology* (106 codes), *digital era* (97 codes) and *ease of technology* (85).

Table 4.3: Categories that emerged out of the interviews

Technological knowledge (TK)	**Codes**
Technologies	197
Favourable conditions for technology integration	106
Digital era	97
New century	160
Faster approach	29
Easy and timely access to information	66
Easier with technology	45

The next section aims to crystallise the emerging technologies, the way in which communication in the FAL classroom improved, as well as the role of these emerging technologies in FAL learning.

4.3.2.1 *Technologies*

In this inquiry learners reported that the technologies available to them comprised the computers in the computer centre at school, their own laptops, cell phones, computers at home, iPads, Kindles, printers and Smart boards, as stated in the feedback below:

> I currently have my phone available to me, my sister's laptop at home and my laptop at school. My kindle when I want to read on the go. The school IT laptop whenever my laptop breaks down, a school back-up laptop that I can take home in case mine breaks down. (P16:22)

Aitken (2014) notes that the integration of technology is not new in language and literacy education. Multimedia tools such as digital storytelling software, Word, PowerPoint, blogs, wikis, Twitter and Facebook are used extensively in schools (Shin, 2013, Turvey, 2006). Other emerging technologies reported by the learners include Smart Response System, Voki characters, blogging, chatrooms, Turnitin software, Photoshop, live animations and movie maker. The learners regarded the following technologies as relevant and important to their FAL learning and development: Turnitin software, Smart Response Simulator, the Smart board, e-mail correspondence, and online resources such as dictionaries, chatrooms and the laptop.

Learners reported that they enjoyed the emerging technologies used in lessons. I agree with Shabitha & Mekala (2013), Krashen & Terrell (1983), Golonka et al. (2014b) and Shulman (1986), who all believe that motivation is one of the key approaches to second language learning and that it is one of the most important components for success in learning a second language. It has been found that highly motivated learners are more successful in the second language acquisition process; accordingly I found that the most important benefit of using technology in a second language class is the increase in learner motivation and interest.

The opposite is also true, however, and it has been noted that high levels of anxiety can hinder second language acquisition. By contrast, learners with low levels of anxiety will be more successful in second language acquisition. Krashen & Terrell

(1983) emphasise that technology integration can lower the affective filter, which enhances the retention of language. This is because the affective filter causes a mental block that results in low motivation, low self-esteem and anxiety. This mental block hinders the comprehension of input that is necessary for language acquisition. Technology innovations present teachers with new opportunities to communicate with their learners and the wider world, for the delivery of content, and for new ways of presenting and creating learning activities (Golonka et al., 2014b). Furthermore, motivation influences attitude.

4.3.2.2 *Favourable conditions for technology*

Learners reported that the support from the technicians, a culture of technology integration at school, internet access and the technical skills of both the teachers and the learners are vital for the successful integration of technology in the FAL class. The learners reported that they regard their technical skills as very good. Most of the learners started to use technology from a young age and technology is second nature to them, as Dede (2005) has stated. Some of the learners mentioned that their parents taught them to use technology, while some also reported that they learnt by using it themselves and, in addition, benefited from IT lessons at school, as reflected below:

> I learnt from my parents and in junior school we were shown the basics of computer skills. I also learnt as I went along and when projects were given to us that I didn't know how to do, I just taught myself. (P3:9)

According to Tondeur et al. (2012) and Nelson et al. (2009), as well as (Voogt et al., 2013b), a lack of technical skills in and professional development for teachers can hinder the implementation of technology. Digital fluency is necessary to function in today's digital society and the skills learnt with technology integration in the school can be used in later in the working environment (Zhao, 2003, Polly et al., 2010). Most of the learners acknowledged that they were very fortunate to have had the technicians available for support. As a rule, technicians are available when there are intranet assessments and the Technology facilitator is available for help and support when teachers attempt any of the emerging technologies for the first time in their lessons.

In addition, the majority of the learners highlighted the importance of reliable internet access for successful technology integration and experienced great frustration when such access was lacking. Although they enjoyed the integration of technology in the

language class, they reported that they did not prefer intranet tests because of problems with internet access and the fear that the technology would not work properly.

> That technology doesn't always work and can fail such as not having internet connection or problems with the computer itself also miscommunication. (P18:25)

As mentioned earlier, a school's policies can also enhance or hinder the implementation of technology. The learners stated that the school promotes a culture of technology integration:

> The existing culture is strong and positive towards technology, most people are willing to learn and find technology exciting. (P10:17)

All of the learners and most of the teachers were comfortable using technology and the administrative staff and even the security staff were making use of technology for their day-to-day activities. The IT Department was attending conferences and seminars in the efforts to stay abreast of the new emerging technologies available and also conducted training workshops with the teachers. Initiatives related to the implementation of technology were encouraged by the school management And ICDL courses were offered to both learners and teachers.

The next section addresses the new century skills that emerged as a result of the technological changes in the environment.

4.3.2.3 *New century skills*

The learners reported they had grown up with technology and that technological skills are important in the digital era. This view coincides with the statement made by Chen, Wu & Wang (2011b) that digital fluency is as necessary as a driver's licence in today's digital environment. Learners need to engage with technology to equip themselves with the skills needed to function optimally in the 21st century. The learners reported in this regard that it is easy and quick to get information from the internet; however, critical skills are needed to evaluate the vast amount of information (Leu Jr, 2002).

Most of the learners confirmed acquiring and using the following 21st century skills as a result of their exposure to technology at the school: access information critically and

competently; improve interactive skills in oral and written communication; know, understand and appreciate other cultures; plan, design, execute and evaluate solutions; think and reason logically; and use information accurately and creatively.

One learner wrote in this regard: “Yes technology does address all of those 21st century skills.” (P14:13)

Zammit (2011) confirms that multiliteracy skills are needed to be fully functional in the digital society. Greene et al. (2014) also mention that learners are challenged to search for information and evaluate its correctness. Traditional literacy is insufficient for the demands of today’s media ecology and learners need the ability to read, comprehend and interact with technology in order to survive (Coiro, 2003). Chen et al. (2011b) further confirm this need for individuals to become new media literate in the high tech 21st century society. (Danzak, 2011) in addition maintain that learners today are fortunate to have more access to electronic, web-based and multimedia communication devices than ever before. However, in the face of all the information available, another skill that must be incorporated is how to read critically the many presentations of information, including interactive simulations, images, multiple print and videos (Greene et al., 2014).

Next, the category, *ease of technology*, is discussed. This discussion also highlights the dependency of learners and teachers on technology.

4.3.2.4 *Ease of technology*

Learners in this inquiry found the easy and timely access to information a huge advantage; this coincide with statements made by Leu Jr (2002) about the advantages of quick and easy access to information. Searching for information whenever you want and wherever you want is very convenient and the access in almost immediate (Howe & Strauss, 2000). In addition, the learners mentioned that it was easy to identify their errors with the Turnitin software and they could correct their errors electronically. Errors were clearly highlighted and colour coded for easy identification on Turnitin, as previously described in Chapter 3. This is reflected in the following statements:

> Experiences that have influenced my use of technology are certain tasks we have to do in class such as essays or presentations for projects which are much easier to be done on your laptop. (P17:32)

> It helps me to be faster. I can type faster than what I write so therefore it's very time efficient. It also helps me be more organised as I sort out all my work and put them in different documents and folders. It also helps me be more knowledgeable as I can Google anything I want to. (P12:19)

Learners also indicated that they saved time when using technology. PowerPoint slides were uploaded on the learning management system (Golonka et al., 2014a) and it was therefore unnecessary to make their own notes. Using technology for writing essays or other transactional pieces also saved time. Typing was quicker than writing by hand and it was also more convenient and faster to mark answers from the Smart board than it had been previously. In addition, the learners could see the correct spelling of words, which aided FAL learning (Yule, 2009). The learners reported that they experienced the integration of technology as very helpful and positive in their learning (Dunkel, 1990b). The learners found certain tasks, such as essay writing or PowerPoint presentations, easier to do on their laptops because of the automatic word count and the fact that mistakes could be corrected easily.

The next section explores the positive attitude that learners have towards technology and the digital fluency that they displayed because technology is part of their world.

4.3.2.5 *The digital era*

Learners are growing up with technology and thus need the skills to survive in this digital environment. Technology is second nature to them and they acknowledge the need for the 21st century skills necessary to function in a technological world. Learners have a positive attitude towards the integration of technology and believe that the classroom is an extension of their world. One learner wrote:

> Many people in the school are pro-technology as the teachers are mostly young and understanding and the students were all brought up with technology so they have no problem with it. Both the senior and junior school are starting to use technology. (P2:39)

Technology has transformed socialising and learners are texting more now than engaging in face-to-face interactions. Learners have consequently learnt the skills needed to express their emotions and feelings via social media. One learner stated in this regard:

> Yes people have become very opinionated. Technology gives us a platform to express your opinion therefore increasing our ability to write persuasive. (P6:19)

Golonka et al. (2014a) acknowledge the positive effect of social media on language learning, as it provides increased access to target language input and immediate feedback in a natural relaxed environment. Another advantage of social media highlighted by one of the learners is the skill to reason and to give your opinion. Learners also considered the collaborative learning as beneficial because learners are placed in a virtual environment where they can view other people's opinions. Learners learn the skill needed to explain their ideas and express themselves in words without non-verbal cues. Social media helps learners to write persuasively which is important for globalisation. Furthermore, the challenges that learners faced were discussed in this data collection instrument.

When discussing the next data collection instrument, the blog reflections, I consider the learners' views on their experiences of the technology-integrated lessons and the effect that technology integration has on their learning progress.

4.3.3 Blog reflections

In this netnographic case study, the learners were asked to reflect on their experiences using a specially created blog for the Afrikaans FAL class. The learners used pseudonyms to protect their identities. The posting of entries was an ongoing activity, usually taking place after a technologically integrated lesson. The focus of the blog entries was reflection on the effect of computer technology on language learning and how the learners experienced the integration of technology in an FAL class. Blog entries were anonymous, even to me, because I wanted the learners to feel free to give their honest opinions. These blog entries were copied and pasted into one document. ATLAS.ti was used to analyse the data gathered using the blog entries and I assigned this MS Word document as a primary document into ATLAS.ti.

Three categories stood out in the learners' blog entries. These are similar to the categories that transpired from the interviews, namely, *technologies* (51 codes), *ease of technology* (30 codes) and *new century skills* (37 codes) as illustrated in Table 4.4

Table 4.4: Categories that emerged from the blog entries

Technological knowledge (TK)	Codes
Technologies	51
Favourable conditions for technology integration	12
Digital era	17
New century	37
Faster approach	12
Easy and timely access to information	5
Easier with technology	30

4.3.3.1 *Technologies*

As was found in the interviews with the teachers, *technologies* were an important category in the blogs. In their blogs the learners indicated that the following emerging technologies were used in class: Learning Management System, Turnitin software, blogging, Smart board, cell phones, smart response devices and chatrooms. They found the Smart board very interactive and helpful with the marking of work. As the school forms part of an eco-project learners commented on the eco-friendliness of technology:

> I like working and doing things on the smart board. It is easy, fun and eco-friendly. (P20:151)

> The use of PowerPoint and smart boards in the class is helpful as it reduces paper waste of printing, we can all see the board and openly discuss the topic. (P20:10)

According to the phases of technology integration advocated by Angeli and Valanides (2009) the school in this inquiry are at a stage where technology is the norm in classrooms and teachers must look for opportunities to integrate technology effectively into lessons.

In the next section I focus on the second category that stood out in the learners' blog reflections and elaborate on the learners' positive experience of technology integration and Turnitin.

4.3.3.2 *Ease of technologies*

Working with technology came naturally for the learners and they reported that their friends were very supportive and helpful. They also reported that tasks took less time

to complete and that they were done more effectively, as well as saying that technology makes learning easier. Because of this quickness and efficiency, more can be done in the available time. The learners indicated that the work is neat and legible, making it easier for the teacher to mark. The learners also reported that collaborative or peer learning makes learning easier because they shared their mistakes with each other, thus collective learning was deemed to be effective. One learner wrote the following:

> The use of technology in the class is very effective as technology is the easiest, quickest and simplest way to work when you know how to use technology properly. (P20:5)

The learners' experience with Turnitin was positive. They described Turnitin as user-friendly which coincides with statements made by Buckley & Cowap (2013) about the easy use of Turnitin in terms of functionality. It was also noted that the Smart board and PowerPoint presentations were very helpful.

4.3.3.3 *New century skills*

Learners enjoyed the integration of technology because it was different from traditional teaching. They could learn independently, resulting in them taking responsibility for their own learning, as advised by Scardamalia & Bereiter (2003). Improvements in sentence structure and remembering the work better were reported by the learners, as also by Dunkel (1990b). According to Brownlee-Conyers (1996), learners are more engaged and active in the learning process, thus resulting in higher-order thinking skills and better recall.

The learners were used to socialising online; thus, by bringing the chatroom into the class, authentic learning was taking place. The learners enjoyed chatting to each other in Afrikaans. One learner reflected:

> It is enjoyable to chat in a chatroom with friends to learn how to speak Afrikaans in a new fun way. (P20:8)

This observation coincides with Shin (2013), who agrees with Krashen (1988) that the more learners engage in the target language the more they will learn the correct sentence structure and their vocabulary will expand. The learners used these applications on a daily basis – it has been found that these can transform existing

teaching and learning language practices (Johnson, Smith, Willis, Levine & Haywood, 2011).

Chinnery (2006) maintains that more collaborative learning environments could be created by means of social media, as the creation of social media has changed the socialising aspect of society. As a result, learners are using more and more written communication instead of oral communication and are constantly busy sending and receiving messages, thus conveying their feelings and emotions via social media. Using texts is second nature as communicating in this way comes naturally to this digital generation. Social media therefore provides opportunities for learning through the collaboration, interaction and co-creation of new knowledge that, in turn, can lead to successful teaching and learning (Wankel, 2011a). Social media also provides opportunities to practise writing (Barlow-Jones & van der Westhuizen, 2011) Furthermore, social media enhances interaction and communication between teacher and learners (Wankel, 2011) and can be used to help with individualised teaching in languages because it opens up opportunities for more personalised learning and teaching experiences. Learners can communicate in a language other than their mother tongue and support can be formally or informally provided as needed by the teacher or more capable peers. This coincides with Vygotsky's (1987) theory.

The next data collection instrument discussed is the technological knowledge (TK) that resulted during classroom observations.

4.3.4 Observations

The recording showed clearly the learners' emotions and the effect of technology on the learners, class discipline, the layout of the desks, as well as the behaviour in class among the learners. Netnography is used to understand virtual communities in the same way as anthropologists seek to understand the cultures, norms and practices of face-to-face communities (Kozinets, 2002). The categories that emerged from the classroom observations include *technologies (50 codes), new century skills (42 codes) and favourable conditions for technology (37 codes),* as illustrated in Table 4.5 below, will now be discussed.

Table 4.5: Categories that emerged from the observations

Technological knowledge (TK)	Codes
Technologies	50
Favourable conditions for technology integration	37
Digital era	5
New century	42
Faster approach	2
Easy and timely access to information	10
Easier with technology	5

4.3.4.1 *Technologies*

From the class observations it was evident that the learners enjoyed technology and were very comfortable with any new technology (Dede, 2005). They were not scared to try out new things, which coincides with the fluency in multiple media that Dede (2005) advocates. Moreover, they were not easily discouraged when the technology was not working, but looked for solutions, for example using their cell phones when they experienced internet connectivity problems. Furthermore, the learners were very supportive towards each other and offered help if someone was struggling to log on or experiencing other problems. When the Smart Response Simulator switched off in the middle of an activity, the learners were very calm and with the help of the Technology teacher they later merely resumed where they had left off. They enjoyed technology and felt free to express their views. Indeed, they were laughing and seemed very relaxed and, thus, an environment conducive to learning was evident. The learners enjoyed chatting in the chatrooms and appreciated the quick individual feedback given by the Smart Response Simulator.

4.3.4.2 *Favourable conditions for technology*

Garrett (1991) stresses the importance of an environment that is conducive for the acquisition of a second language. In addition, Krashen (1982) and Krashen & Terrell (1983) warn about a mental block that can occur as a result of anxiety, low motivation and low self-esteem. Therefore, classroom management plays a big role in the integration of technology in the class. The teacher has to be strict yet also flexible and relaxed so that learners feel free to attempt things, make mistakes, learn from their mistakes and enjoy the target language. The physical set up of the desks is also important so that learners can see the smart board clearly and interact and collaborate in class.

4.3.4.3 *New century skills*

Kereluik et al. (2013) note that it is important to know when and how to use specific technology for specific subject matter. In addition, Johnson & Adams (2011b) mention that the abundance and accessibility of resources and relationships via the internet are key drivers for technology. It is also important to note that content informs technology and no technological teaching activity can occur without content; one cannot teach without content but you can teach without technology. Kereluik et al. (2013) emphasise the importance of a thorough understanding of the discipline irrespective of the rapidly changing technological world. Teachers need to adapt to the technological changes in the environment and stay updated on the latest education technology and trends, and schools should reflect the technological changes in the environment (Wilson, 2006). The school management should be aware of the challenges that teachers face with the integration of technology. However, Golonka et al. (2014a) urge teachers to seek for solutions to overcome these challenges because of the positive impact that technology can have on teaching and learning. The emerging technologies used in this inquiry in the FAL classroom included the Learning Management System, chatrooms, blogs, smart board, the Smart Response Simulator and Turnitin software. In addition, the learners used their laptops and cell phones on a daily basis.

Table 4.6: Advantages and challenges that transpired from technological knowledge (TK)

Advantages	Challenges
Increase in learners' motivation and interest	Lack of strong internet access
Learners acquire skills that support them with the demands of the 21st century	May lose work
Access to large amount of information	Technology not working properly
Learners can broaden their work resources which helps with individual learning	Not enough technical support by the Information and Computer Technology Department
Specific programs are available to address specific needs	
Helps with organisation of work	
Improved communication among the learners and between learners and the teacher	
Technology expands their learning	

It is evident that learners and teachers see the value of technology integration in the FAL class, as both reported on the importance of staying relevant amidst the technological changes in the environment. It is possible to eliminate the challenges

that were reported in this inquiry. Therefore, a summary of the advantages and challenges is presented (Table 4.6).

In this next section I will discuss the themes that emerged from the technological knowledge of this inquiry.

4.4 Themes that emerged from the technological knowledge (TK)

4.4.1 Theme 1: A century characterised by fast-moving technological innovations

The following two categories relate to this theme, namely, new century skills and digital era (see Figure 4.1). The third category will be discussed in chapter 5.

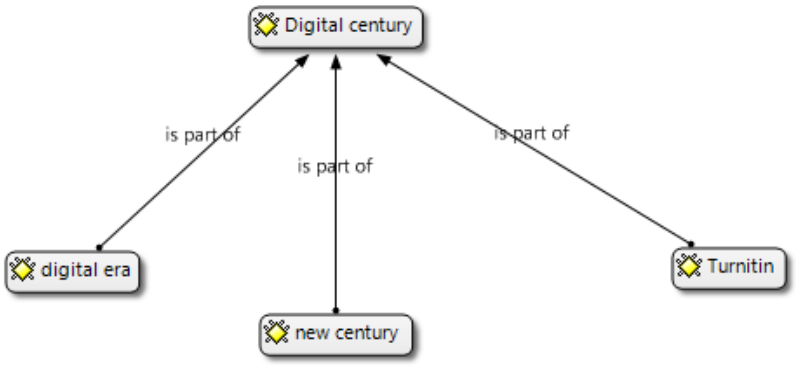


Figure 4.1: Categories relating to the theme: digital century

4.4.1.1 *Learners need 21st century competencies in order to survive*

As illustrated in Figure 4.2, the category of new century skills included the following seven sub categories, namely, 21st century skills, interesting lessons, different experience, enjoy technology, eco-friendly, motivation and positive experience.

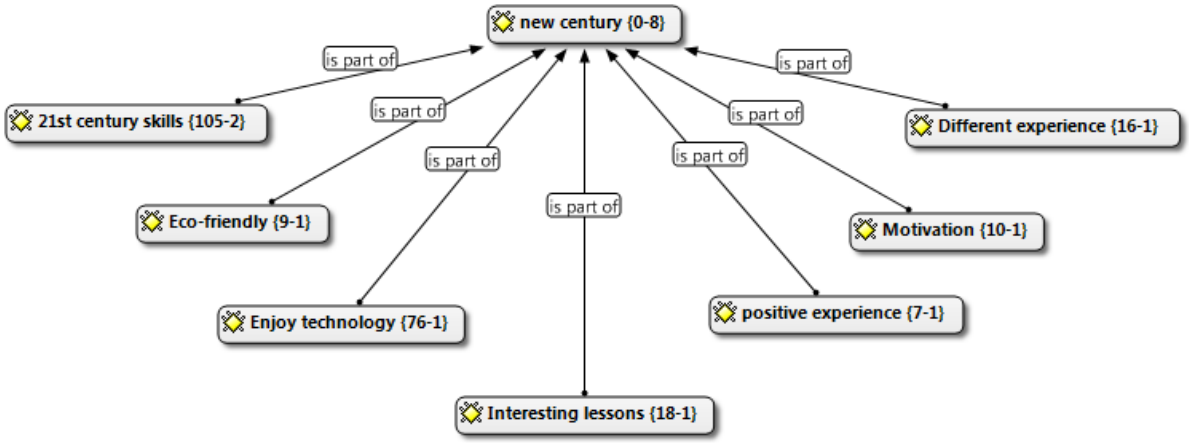


Figure 4.2: Sub categories relating to the category: new century skills

An overview of the typical evidence is provided in Table 4.7 for the category of new century skills.

Table 4.7: Codes and typical quotations relating to the category of new century skills

Code	Quotations
21st century skills	Yes, technology does address all of those 21st century skills (P14:13) I really think technology addresses the 21st century skills because, even without being aware, the learners end up applying them (P21:45)
Interesting lessons	It also makes learning more interesting and fun (P3:4) It makes lessons more interesting and fun to be in when there is something different (P20:33)
Different experience	It was lots of fun to be taught in a different way (P20:100) Technology helps make lessons more enjoyable and different to what they usually are which helps keep you focused (P3:13) It makes the experience different, so I see it in a different light and, if it's something new, I will try my best to get the best (P9:12)
Enjoy technology	I really enjoyed this lesson because it was interesting learning about new technology (P2:9) I think that it makes learning easier and more enjoyable (P3:29)
Eco-friendly	I enjoy using technology as it is easier to correct mistakes and it also prevents us from wasting paper in the movement of becoming eco-friendly (P7:3) The use of PowerPoint and smart boards in the class is helpful as it reduces the paper wasted in printing, we can all see the board and openly discuss the topic (P20:10)
Motivation	It makes the experience different, so I see it in a different light and, if it's something new, I will try my best to get the best (P9:12) Our learners are digital these days, they use technology and thrive on it. It is the biggest motivator if it is used in class (P21:12)
Positive experience	I think that technology use in the class is positive (P12:1)

Integrated discussions and interpretations

Public and private organisations all agree that new, 21st century skills are required in a digital environment (Binkley et al., 2012; Dede, 2010). According to Cramer (2007), 21st century skills include digital-age literacy; visual and information literacies; basic scientific, economic and technological literacies; multicultural literacy; global awareness; adaptability; inventive thinking; risk-taking/higher-order thinking, sound reasoning; social and civic responsibility; managing complexity, curiosity, creativity; effective communication; teamwork, collaboration, interpersonal skills; interactive communication, prioritising, planning and managing for results; and the ability to produce relevant, high-quality products. One of the biggest challenges that teachers and learners face today is the evaluation of the quality of the enormous amount of information that is available. It is, therefore, vitally important that learners acquire the skill of locating, organising and evaluating information by reflecting critically on the information.

Cramer (2007) is of the opinion that technology is the tool that will help learners to acquire all the necessary 21st century skills. This statement by Cramer (2007) is in line with the reports of the learners that they were able to acquire the 21st century skills with the use of technology in class. Some of the participants even stated that they learnt and used the skills without realising it. The integration of new technologies in the lessons was viewed as a very positive experience (Armstrong & Yetter-Vassot, 1994), while the learners found the lessons with technology integration enjoyable and interesting (Golonka et al., 2014b). In fact, the learners preferred the lessons with new technology as they were exciting and different and they also motivated the learners to do their best (Dede, 2005). Shabitha & Mekala (2013) and Shulman (1986) believe that highly motivated learners learn more effectively in the second language acquisition process compared to poorly motivated learners. It was evident that the majority of the participants enjoyed the integration of technology in the language class (Dede, 2005). In addition, the participants were also very concerned about the environment and regarded technology as eco-friendly because it reduced the use of paper. The school was participating in an eco-school project at the time of the study.

4.4.1.2 *We are living in a digital, innovative and advanced era*

As illustrated in Figure 4.3, the following four sub categories emanated from the aspect of the digital era namely, preparing learners for the digital era, growing up with technology, digital writing, and social media.

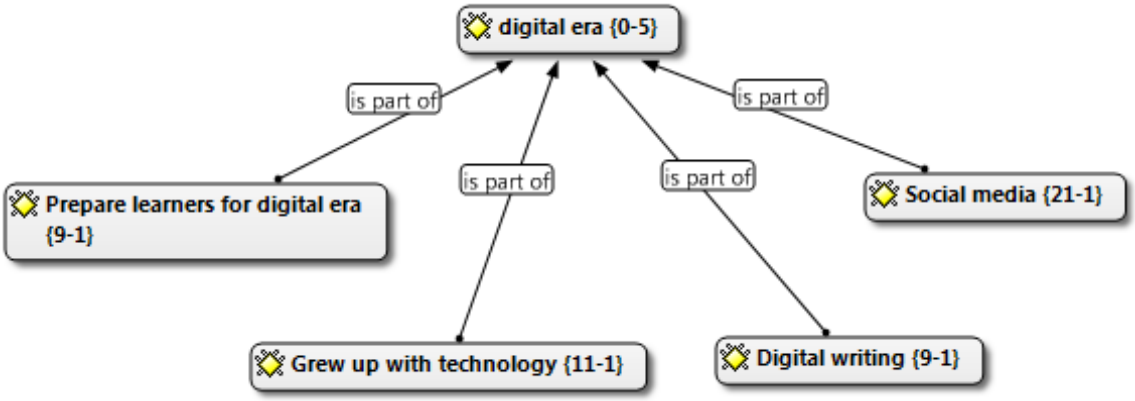


Figure 4.3: Sub categories relating to the category: the digital era

Table 4.8 contains an overview of certain typical quotations pertaining to the category of the digital era.

Table 4.8: Codes and typical quotations for the category of the digital era

Code	Quotations
Prepare learners for digital era	Yes, it prepares students for the world out of school where technology is used in almost every situation (P1:53) You learn skills you can use in the working environment (P15:20)
Growing up with technology	Many people in the school are in favour of technology as the teachers are mostly young and understanding and the students were all brought up with technology so they have no problem with it. Both the senior and junior school are starting to use technology (P2:39) Most learners are surrounded with technology and it is a necessity for this school and its environment (P21:27)
Digital writing	Implement the use of laptops more actively and allow the use of them to make electronic notes (P7:13) Should have equal involvement in schoolwork as normal longhand writing (P4:1)
Social media	I enjoy connecting to friends through social media and technology. I have been able to stay in touch with some of my friends who have left the country through technology (P3:11) I make use of social media to interact with friends and family (P7:10)

Integrated discussions and interpretations

According to Dede (2005), learners today are growing up in a world in which technologies are second nature to them. Voogt et al. (2013a) are of the opinion that

the “game of teaching” in the 21st century has changed and, therefore, the players need to change. The learners indicated that they would prefer more activities that involved the use of the laptop. They felt that the typing on the laptop should equal the normal writing out of work. They regarded digital writing as a replacement for normal handwriting with the files on the laptop replacing exercise books. The learners were very accustomed to technology because they are surrounded by it. All the participants felt that they were being given an advantage because their exposure to technology at school was preparing them for the digital world in which they live. They would, thus, be well-prepared for tertiary institutions as well as for the working environment (Johnson & Adams, 2011a).

The learners acknowledged that they spend considerable time on social media outside school hours. Scardamalia & Bereiter (2003) are of the opinion that digital technologies have changed knowledge as we know it while the way in which knowledge is acquired, represented and used has changed in almost all domains. Knowledge building is equivalent to knowledge creation. It is, therefore, important to note that the focus is no longer on reproducing information and content because information is freely available on the internet. It is therefore essential that fluency in writing be incorporated in the knowledge that learners require if they are to be functional members of the 21st century (Lessig, 2008). Social media provides a platform for constructivist learning: collaboration, learning, interaction and co-creation which can result in improved teaching and learning (Scardamalia & Bereiter, 2003).

This section discussed the first theme, namely, “*A century characterised by fast-moving technological innovations”.* This theme involved two categories, namely, new century skills and the digital era. The digital environment is transforming teaching and learning and, more especially, FAL learning. It is influencing the pedagogy, content and technologies used in the classroom. It is, therefore, vital that teachers focus on the skills required if learners are to become fully functional members of this digital century. Multi-literacies, 21st century skills, social media and digital fluency must be incorporated into the curriculum. In addition, teachers need to be co-designers of the curriculum with learners because the learners are often more up to date with the newest technology than the teachers. I have learnt from experience that teachers need to be honest with their learners about their limitations regarding technology in advance as the learners will then have more respect for their teachers than may otherwise be the case. Teachers must adopt a flexible approach to curriculum design

while learners must have the freedom to choose the mode of delivery and the topics they will be taught. In addition, the focus on content must move away from merely reproducing information and content to the active creation of new ideas in a collaborative environment. This would be very beneficial for language acquisition because it enables learners to interact in the target language in virtual environments with people all over the world, thus making learning meaningful because it is an authentic experience that leads to engagement and deeper learning.

The following section discusses the second theme, "*The integration of technology into teaching and learning in this digital era"* and its categories, namely, technologies available, challenges involved in technology integration and favourable conditions for such technology integration.

4.4.2 Theme 2: The integration of technology into teaching and learning in the digital era

The technological aspect of the environment and the rapid pace at which technology is changing is forcing teachers to reflect on their approaches to teaching. Voogt et al. (2013a) describe this scenario as the "game of teaching" in the 21st century. They argue that the "game of teaching" has changed and that the players need to change. If teachers are to be successful in the 21st century, it is essential that they acquire 21st century competencies. New pedagogical approaches are required in order to achieve the correct "fit" between pedagogy, technology and specific subject matter. In addition, teachers must be informed about the newest technologies and how to integrate them effectively into their lessons.

It is incumbent on teachers to reflect on their role and to adapt to the technological changes in their environment (Yu-Mei, 2002). However, teachers also need to guard against using technology in order to manipulate content (Yu-Mei, 2002). Koehler & Mishra (2009) agree with Yu-Mei (2002) and caution against the manipulation of content to suit technology because technology has the potential either to constrain or to support content. Most of the technology available has not been designed specifically for education and therefore teachers need to investigate the potential uses of the available technology (Mishra & Koehler, 2008). It is also important for teachers to look at the potential that some content may have for technology. The following three categories relate to the theme of technology integration, namely, available

technologies, challenges involved in technology integration and favourable conditions for technology integration (see Figure 4.4).

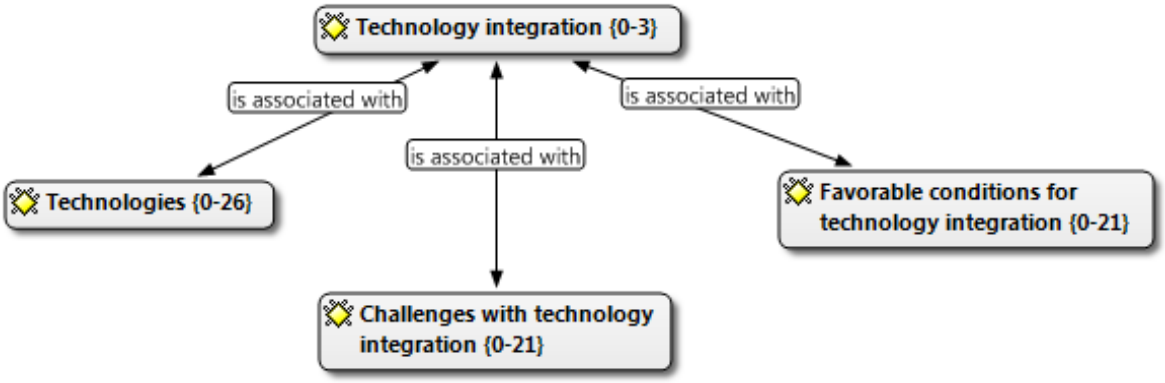


Figure 4.4: Categories relating to the theme: technology integration

Technology integration is the second core theme which emerged. The related categories are discussed in more detail, while the supporting, empirical evidence for the categories is also elaborated upon. There are also constant comparisons with the relevant literature to guide my interpretation of the data which was collected.

4.4.2.1 *The rapid evolution of technologies*

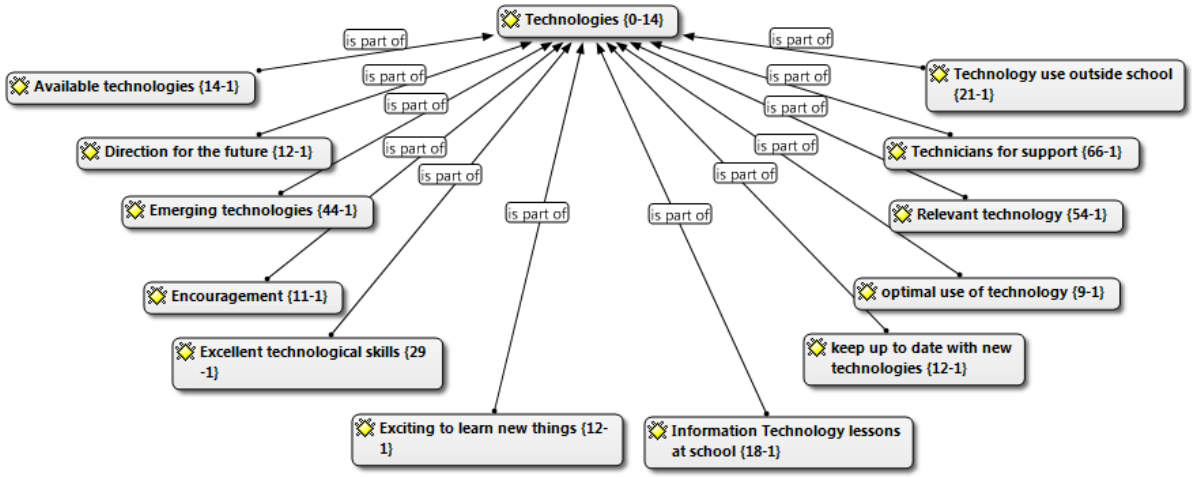


Figure 4.5: Sub categories relating to the category: available technologies

The following twelve aspects were reported by the participants, namely, available technologies, direction for the future, emerging technologies, encouragement, excellent technological skills, exciting to learn new things, IT lessons at school, remaining up to date with new technologies, relevant technologies, technicians for support, technology use out of school and the optimal use of technology (see Figure 4.5).

Table 4.9 presents an overview of the supporting evidence for the category of available technologies.

Table 4.9: Codes and typical quotations for the category of available technologies

Code	Quotations
Available technologies	Computer centre, laptops, Wi-Fi throughout the school, school intranet access, cell phones, smart boards (P6:31) Our available technological resources include computers which you will find in the Information Technology classroom. We have access to smart boards in most classrooms that require them. We have our own laptops on which we do work assigned by our teachers (P9:39)
Direction for the future	New technologies are constantly being introduced to us and it is important that we learn how to use them because technology is the basis of our future (P5:2) Our school is moving more and more into the technological direction with almost everything being computerised or taught on smart boards. Everyone is open to this change and growth including students, teachers, parents and the governing body and everyone uses the technology at hand openly and freely with no resistance. I think that everyone realises how beneficial the use of technology is and that is why we use it as often as we do (P5:38)
Emerging technologies	Intranet, Turnitin, internet, Kid Blog, smart board, Google translate, cell phones, chat rooms (P20:31) I find that using Voki as a tool at the beginning of the lesson helps to draw attention and interest to the lesson (P21:7) The use of controllers for an interactive poetry lesson. I had to answer questions displayed on the board electronically and the controller then submitted my response to the group results. It was relevant as we were learning about poetry. I benefited from the activity as I was able to see my mistakes and the correct answers on the smart board (P7:20)
Encouragement	I would recommend it because it encourages learners to communicate and be creative (P21:57)
Excellent technological skills	I know what I understand about how computers work and I know how to use them. I find it easy to use them and I am used to working on them. I enjoy working on them (P3:8) I think that my level of computer proficiency is much higher as I am able to do so much more with my laptop that I have ever before (P8:9)
Exciting to learn new things	I enjoy the technological tasks we are assigned and participate in class. It is exciting learning new things (P2:29) We learn different things by using technology every day and it is fun learning how to do things in different ways. It is also good to change the way we are taught sometimes because in that way we do not get bored (P8:18) You will also notice a change in your students because bringing technology into the picture will give you more confidence in your students, they will pop out of their shells because it gives them the opportunity for a whole new experience (P9:36)
Information technology lessons at school	Compulsory computer lessons in junior and senior school (P2:13) I acquired some of these technological skills at home but learnt a lot more at school from friends or assistance from the IT department (P17:38)
Keep up to date with new technologies	The school should update to a system that helps them stay updated and helps the children become more interested (P6:1) I try to keep myself in the loop by using all the available technology apps that I come in contact with just to make sure that I don't miss anything (P21:98)

Code	Quotations
Optimal use of technology	The school could help students learn new ways of how to use their laptops (P8:45)
Relevant technology	Interactive smart board lessons help keep me focused (P7:16) The smart board, in general, is a successful use of technology in my Afrikaans classroom (P9:16)
Technicians for support	The assistance I get concerning my laptop at school is given by the IT staff who are available to us at school to solve any technical problems we might have (P3:3) I would describe the technical support at school as a very efficient support. The IT department staff regularly does checks on technical matters around the school to ensure that everything is running smoothly. They are also available to us during intranet tests to make sure that everyone in class is able to access the internet with no problem in order to complete the test (P17:24)
Technology use outside school	Outside of the classroom I use technology to go onto social media, play games, edit photos, surf the internet and read online books (P8:13) Social media are social networks and communicating with people. Reading about certain thing such as informative blogs or new websites and applications. Online shopping is also something I do (P11:7) I do projects and assignments on my laptop. I communicate via email and sms. We do research on computers and laptops. I also have fun on my laptop by using Facebook and watching movies on my laptop (P14:5)

Integrated discussions and interpretations

Technology is an integral component of the teaching process because learners require the necessary skills and knowledge to be fully functional in the digital world in which we live (Voogt et al., 2013a). Koehler & Mishra (2009) consider the use of technologies such as cellular phones, laptops, computers, iPads, blogs, Facebook and Twitter as technological knowledge. This knowledge is growing continuously because of the rapid changes in the technological sphere. The available technologies which the participants in this inquiry reported included their laptops, their cell phones, their iPads, computers in the computer centre and smart boards. Most of the learners indicated that they felt it was an advantage to be at a school that was technologically advanced. This thinking is in line with Binkley et al. (2012) who reported that the workplace requires employees who are able to communicate, think critically, understand new ideas, analyse information, work in teams and who are problem-solvers. Digital fluency is a prerequisite in a digital work environment.

The participants believed that technology integration in schools is the direction for the future (Lessig, 2008). Emerging technologies that participants used included the Smart Response System, Voki characters, Turnitin, chat rooms, media player, PowerPoint, Excel, Movie Make, tablets, blogging on Kid blog and YouTube. The

participants displayed a lot of confidence regarding their digital fluency. They described their technical skills as ranging between excellent and very good.

According to Tondeur et al. (2012), a lack of technical skills, a lack of time and insufficient access to technology are all factors that may hinder the integration of technology in lessons. The participants enjoyed learning new things and this made the lessons interesting, different and fun. The learners had learnt some of their technical skills from their parents, friends and the Information Technology lessons at school. The majority of the participants had also completed the ICDL course offered through the school. As mentioned before, technology is changing at a rapid pace. Most of the participants agreed that it is essential that the school and teachers are aware of developments in technology as also advocated by (Lessig, 2008). It is interesting to note that most of the participants considered the smart board and the Smart Response Simulator lesson to be extremely useful. In the main, the participants appeared to have a good relationship with the technicians. Some of the learners reported that they did not really have contact with them at all because they rarely had problems with their laptops.

The participants' responses regarding the use of technology out of school indicated that they mainly used their cell phones for social media, music and games. In addition, they enjoyed watching movies on their laptops.

4.4.2.2 *Challenges with technology integration*

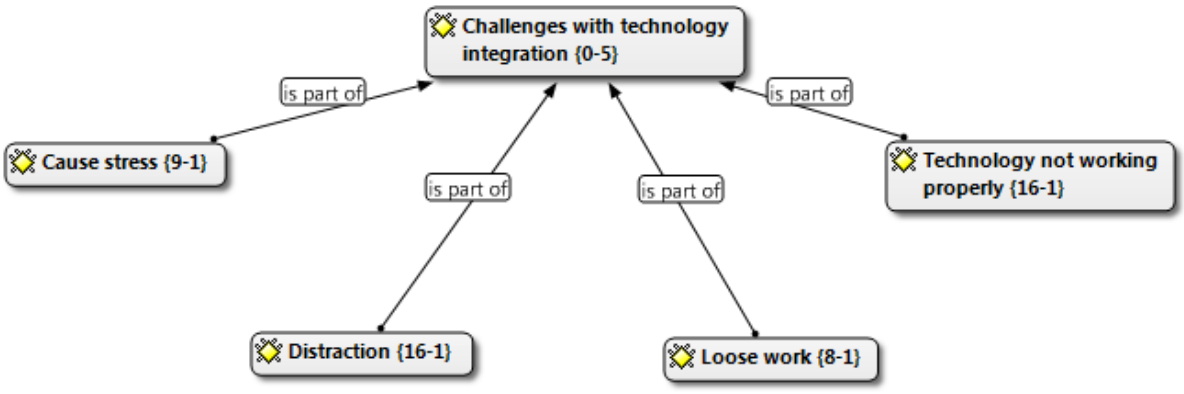


Figure 4.6: Sub categories relating to the category: challenges with technology integration

The study revealed that the integration of technology in the school had not been without challenges. The participants identified the following four major challenges,

namely, the stress caused, distraction, loss of work, and technology not working properly (see Figure 4.6).

Table 4.10 presents an overview of the supporting evidence for the category of challenges with technology integration.

Table 4.10: Codes and typical quotations for the category of challenges with technology integration

Code	Quotations
Causes stress	Technology can be very annoying as it can cause stress (P1:5) Sometimes laptops and other devices don't work properly which is stressful when you are about to write a test (P14:2) The intranet doesn't work every day and it becomes very difficult for us when it doesn't because we stress a lot more (P20:82)
Distraction	Technology has its disadvantages as I can become distracted(P1:12) Technology, such as cell phones and laptops, can be a distraction to us (P5:8) Having laptops and phones at school can sometimes be distracting but, if used properly, they are convenient for researching facts, etc.(P7:5) Technology does cause distraction in class. I feel it becomes so easy to do other things and not focus on the work at hand (P13:2)
Lose work	My laptop crashed and I lost most of my documents that I had been working on for school (P3:12) A negative experience would be the numerous times when I have been busy with a project for a good 2 hours and forget to save at various points, and my word programme stopped working and shut down, losing all my work and having to restart (P10:14)
Technology not working properly	Unfortunately, if my laptop isn't working or the internet is down, it can slow down my working process. However, when the technology is working properly it is, in my opinion, very advantageous (P7:6) Technology can be frustrating when it does not work (P20:20) When technology fails on us, as an example, if the laptop, for some reason doesn't want to switch on, or the PC overheats, it isn't a quick fix (P9:6)

Integrated discussions and interpretations

Despite the overwhelming positive aspects of technology integration the learners did share negative experiences they had had regarding the implementation of technology. They mentioned that they worry when they write intranet tests because of the inconsistent internet access. The internet does not always work properly and this causes considerable anxiety, sometimes resulting in the learners not performing well in their tests. This statement is in line with the findings of Golonka et al. (2014b) who reported the frustration experienced by learners when technology does not work properly.

According to the learners distraction was the biggest problem arising from the integration of technology in the class. From my own experience I have to agree with this finding as I have noticed the huge impact distraction may have on teaching and

learning. It was very easy for the learners to go onto the internet or to listen to music when they were supposed to be paying attention in class. Another problem or challenge that learners reported was their losing work. Although the learners are taught to back up their work, they do not always make backups and this may result in their losing their work. Some of the learners reported that they had lost work because of a battery that had died suddenly or laptops that had crashed. This leads us to the fourth challenge, namely, technology that does not work properly. The learners reported their frustration when technology failed to work properly and they could not fix the problem themselves.

4.4.2.3 *Conditions favourable for technology integration*

The participants were also asked to indicate favourable conditions for technology integration. As illustrated in Figure 4.7, the following eight sub categories emerged, namely, passionate, technologically-skilled teachers, positive attitude of the participants, internet access, sound technical skills, culture of technology, laptops in good condition, good resources, efficient classroom management and administrative staff for support.

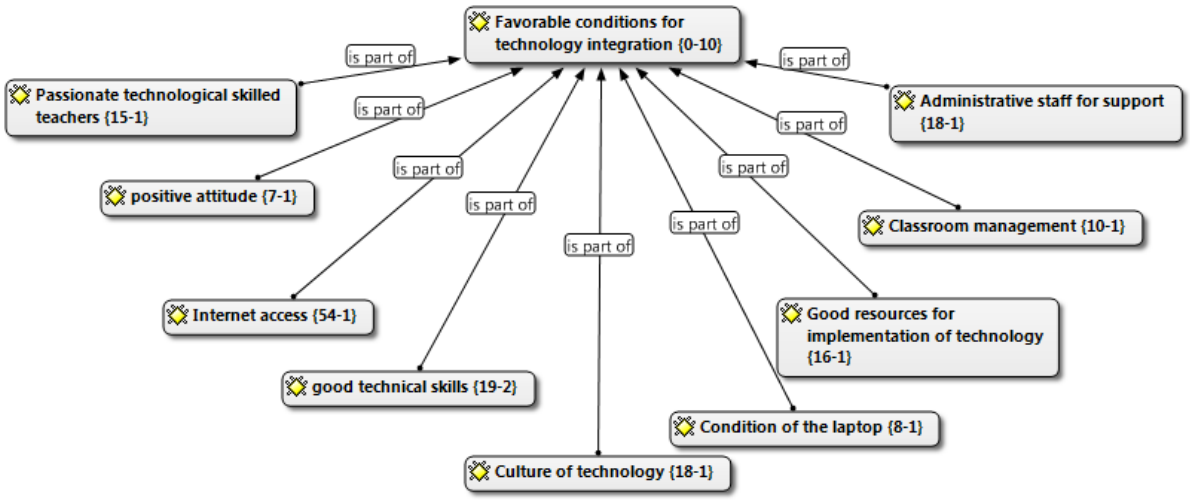


Figure 4.7: Sub categories relating to the category: favourable conditions for technology integration

Table 4.11 presents an on overview of the supporting evidence provided for the category of favourable conditions for technology integration.

Table 4.11: Codes and typical quotations for the category of favourable conditions for technology integration

Code	Quotations
Passionate, technologically-skilled teachers	The IT technicians are always available and willing to help and our teachers are also quite clued up in this regard (P5:41) Very good. Most of the teachers know the basics of technology and the IT team are always there when we need them (P13:22) Successful integration requires a well-educated instructor to lead and instruct learners (P21:35)
Positive attitude	A keen interest in using technology on the part of both the educator and the learners is very important as it will lead to new innovations (P21:52) Attitude of learners regarding the use of technology is very positive (P21:63)
Internet access	No internet connection or very slow internet when I have an assignment to complete (P5:9) The intranet test was easy to complete – not because of the work, but because the lay-out was simple and I could change an answer without having to use Tippex or cross it out. It was stressful to make sure that my intranet was working but useful overall (P7:2) They could get a better Wi-Fi, network system in the area because it so slow especially when a lot of people are on at once (P19:15)
Sound technical skills	My technological skills are good, I can work most devices and I can figure out new ones quite quickly (P13:3) But it is seldom that I come across problems of not knowing what to do. If so then it would be problems that need fixing and that would involve the technicians at school (P11:16) When I was smaller I went for computer lessons before I started school and then from grade 0 to grade 9 I had IT (computer sciences) as a class (P1:15)
Culture of technology	Our school encourages technology in the school culture as all the girls are expected to have and make use of laptops as part of the school's requirements (P1:51) Many people in the school are pro-technology as the teachers are mostly young and understanding and the students are all being brought up with technology so they have no problem with it. Both the senior and junior school are starting to use technology (P2:39)
Laptops in good condition	The school laptops should be of a better quality and not so expensive (P1: 60) Laptops needs to have up to date software and should be in a good state for working (P21:33)
Good resources	It depends on the other schools' resources. If they are able to afford to implement technology throughout the school then I think that I would recommend using technology as it is the direction the rest of the world is moving towards (P2:40) Yes and no, depending on the financial standards or the school and if the school can afford the expense of a whole long term system that is implemented. Yes, as it would provide a larger source for students and teachers to improve learning and teaching (P11:28)
Administrative staff for support	The administrative staff is excellent and will help with any given problem that they can solve (p1:59) My relationship with the administrative staff is very good (P2:44) I don't often find myself with the admin staff. When I am there, they are always friendly and helpful (P13: 24)

Integrated discussions and interpretations

It was apparent that the technical skills of both the learners and the teachers were adequate because of the in-service training and support provided by the school. The learners were appreciative of the support that they received from the administrative staff. They appeared to have good relationships with the administrative staff that were also very helpful and supportive. In addition, the administrative staff upheld the culture of technology because all the communication with the stakeholders was done electronically. The administrative staff at the school must be computer literate because the school is a digital environment.

It was evident from the video recordings of the lessons that sound classroom management is of the utmost importance for technology integration. Yu-Mei (2002) is of the opinion that technology may transform the class organisation and the social learning climate as well as the teacher–learner interaction. Yu-Mei (2002) suggests that the classroom must be arranged in such a way that learners are able to work in both in groups and individually with ease, thus facilitating easy, convenient interaction between the learners themselves and between teacher and learners. In addition, a good balance needs to be maintained between a relaxed classroom management style and a strict classroom management style. Learners need to feel free to experiment with technology and they must not be scared to make mistakes, although they also need to know what the boundaries are. Technology can easily distract the learners from the important lessons in class. However, the learners have grown up with technology and it is a natural process for them to use it in school.

The condition of the laptops was perceived as extremely important. The Information Technology Department plays a vital role in the smooth integration of technology in a school organisation. However, it is also costly to maintain the smooth running of technology in a school. The fact is that the success or failure of the Information Technology Department plays a significant part in the success or failure of the integration of technology in a school. In addition, it is essential that technology is constantly updated because of the rapid pace of technological development. Both learners and parents expect the school to stay updated and to be in line with technological developments outside the school. Voogt et al. (2013b) reported that the school's policies may influence the integration of technology and it is imperative that such policies promote the positive integration of technology into lessons. There is

clearly a culture of technology in the school as all the staff has introduced the use of technology. Access to the internet was also one of the most important facts that the learners mentioned. It is clear that teachers and learners need to be digitally fluent for the successful integration of technology (Lessig, 2008).

The next section will investigate the categories "*Easy and timely access to information, ease of technology and faster approach"* under the theme "*Speed and ease of technology"* that emerged from the data collected and also from the literature review in Chapter 2.

4.4.3 Theme 3: Speed and ease of technology

As illustrated in Figure 4.8, the following three categories relate to this theme of speed and ease of technology, namely, easy and timely access to information, ease of technology and a faster approach to do more in a shorter space of time.

Speed and ease of technology is the third emerging core theme. The related categories will be discussed in more detail and will be supported by empirical evidence. Constant comparisons with relevant literature will be made to guide the interpretation of the data collected.

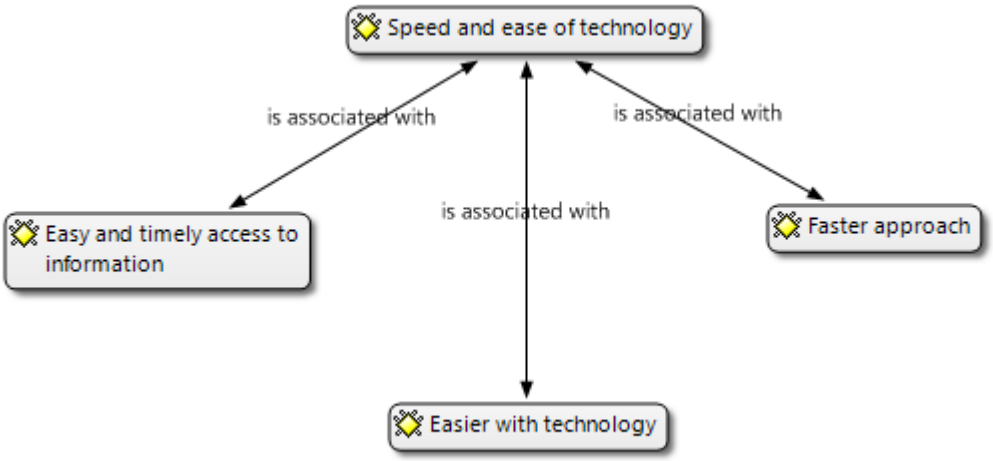


Figure 4.8: Categories relating to the theme: speed and ease of technology

4.4.3.1 *Easier with technology*

As illustrated in Figure 4.9, the following six sub categories emerged from the category of easier with technology, namely, helpful, makes learning easier, easy to make notes,

neat presentation of work, easy to identify and correct mistakes, and makes communication easier.

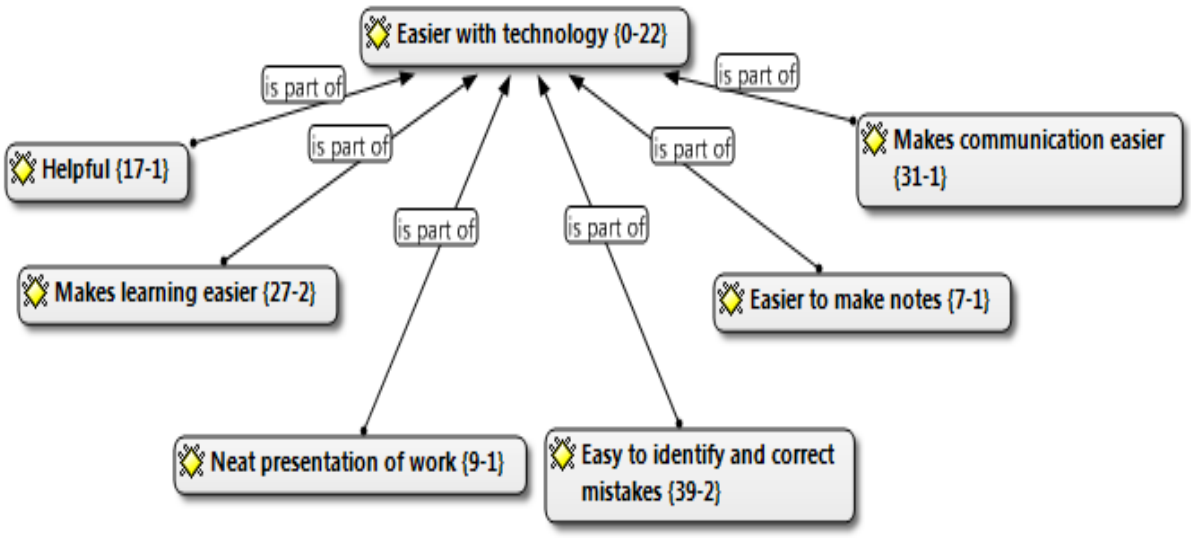


Figure 4.9: Sub categories relating to the category: easier with technology

Table 4.12 presents an overview of the typical evidence provided for the category of easier with technology.

Table 4.12: Codes and typical quotations for the category of easier with technology

Code	Quotations
Easier to identify and correct mistakes	With the use of technology we can easily find out where our mistakes are (P5:1) Being able to see exactly where mistakes have been made and correct them (P20:76)
Helpful	I think that technology is very important in class and can be very helpful (P3:1) I think, in general, technology in the classroom is very useful and I enjoy using technology as a medium for learning (P7:15)
Makes communication easier	It helps me to communicate easily(P1:17) It is also easy to receive emails on our laptops or cell phones immediately (P5:24)
Makes learning easier	The SMART board is really amazing, it makes us focus in class, and it makes learning the work a lot more fun (P20:83) Yes, I think that it makes learning easier and more enjoyable (P3:31) Peer learning benefits my learning as seeing other learners' mistakes and those learners showing me mine help me to improve my Afrikaans (P20:24)
Neat presentation of work	Work is neater (P2:26) Our work can be sent to our teacher in an efficient, neat and legible way , it makes it easy for our teacher to edit our work on websites designed for this (P20:6)
Tasks are easier	Tasks seem easier and are quicker to finish (P2:24) It makes it easier and faster (P19:8)

Integrated discussions and interpretations

Kunka (2011) highlights the advantages of the error identification and corrections that may be customised on Turnitin. This facility makes the marking much easier and faster. Most of the participants were of the opinion that technology helps tremendously with the identification and correction of errors. They also preferred to write essays on their laptop because they could be given their word count, it was easy to correct mistakes and very convenient just to email the work directly to the teacher or upload it on a system. In the main, the participants perceived the use of technology to be helpful and beneficial (Nelson, 2008, Brownlee-Conyers, 1996). They had all experienced that technology makes learning easier and much more fun while also facilitating the neat presentation of work. It is important to note is that some of the participants felt that their work had generally improved (Dunkel, 1990b).

4.4.3.2 *People often assume a faster approach is a better approach*

As illustrated in Figure 4.10 the following three sub categories emerged from the aspect of a faster approach is a better approach, namely, saves time, submission of work is easier and easy translations of English to Afrikaans.

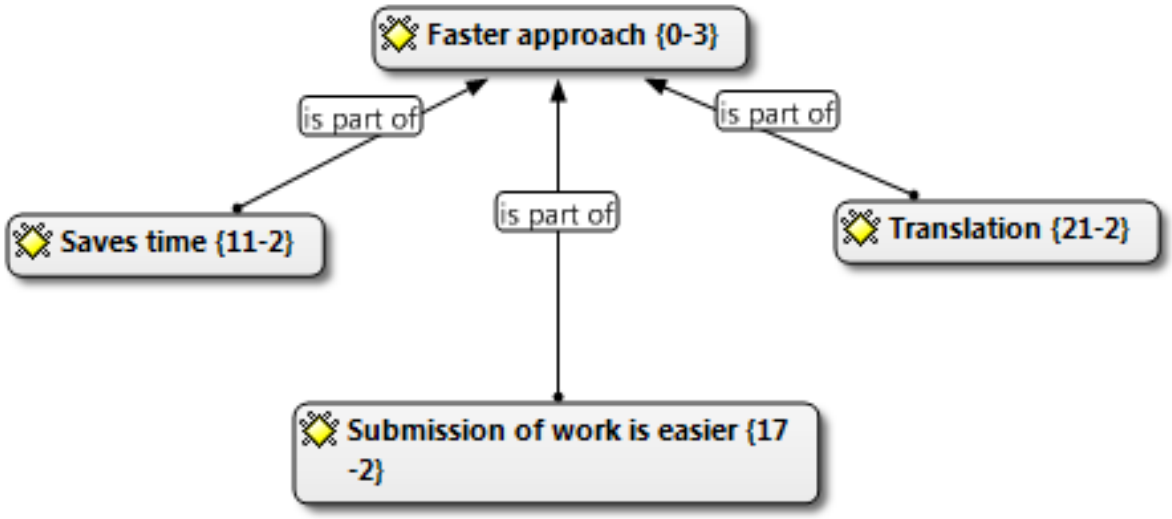


Figure 4.10: Sub categories relating to the category: faster approach is a better approach

Table 4.13 presents an overview of the typical evidence provided for the category of a faster approach is a better approach.

Table 4.13: Codes and typical quotations for the category of a faster approach is a better approach

Code	Quotations
Saves time	I am able to take notes quickly and mark answers off the board, thanks to the smart board (P13:11) I enjoyed working on the devices as it was direct and time efficient (P20:95)
Submission of work	Technology makes the submission and feedback of work easier and more effective (P3:13) Getting work done faster, more enjoyable and easier to hand in (P18:26)
Translation	The internet is also useful for research and translating (P5:23) I can access Google Translate for words I don't understand (P13:9)

Integrated discussions and interpretations

As mentioned earlier, people often assume that the faster approach is the better approach. However, the fast approach makes demands on the learner. In order to survive learners must constantly balance their lives. The increase in bandwidth means that teachers and learners are able to connect anytime and anywhere (Johnson & Adams, 2011a). The participants also indicated that they regarded the time-saving component of technology as important. They explained that using the smart board to mark their work saved time because the teachers did not have to repeat the answers while it also helped the learners with the spelling of the words. In addition, time was saved when the teacher put the PowerPoint slides on the intranet and the learners did not have to waste time by taking notes. The use of the learning management systems helped with the communication of work related activities to the learners while it also helped teachers both to organise course content and interact with multiple learners (Golonka et al., 2014a). The learners stated that they enjoyed working with the Turnitin software because it was easy to access and upload the work (Dahl, 2007). They also reported that they appreciated the proof provided by Turnitin software when an assignment had been uploaded and that this helped to avoid confusion about submissions of assignments between learners and teachers. The learners mentioned that they generally used Google Translate to look up the English translation when they did not understand an Afrikaans word and that this contributed to self-directed learning.

4.4.3.3 *People want easy and timely access to information*

As illustrated in Figure 4.11 the following three sub categories emerged from the category of easy and timely access to information, namely, available resources, easy access to information and makes research easier.

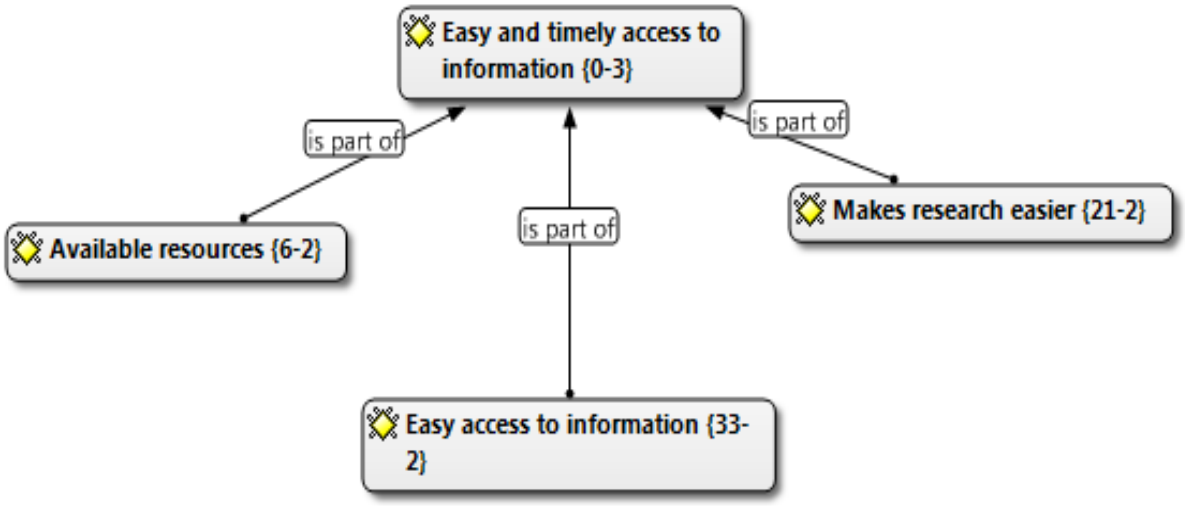


Figure 4.11: Sub categories relating to the category: easy and timely access to information

Table 4.14 presents an overview of the typical evidence provided for the category of easy and timely access to information.

Table 4.14: Codes and typical quotations for the category of easy and timely access to information

Code	Quotations
Available resources	We have technicians and friends to help us work all our technology. We can also do research on YouTube and other sites on how to work am application or program on all our technology (P14:15)
Access to information on the internet	It gives me access to worldwide information (P6:12) I believe that technology is a newly developed way and, as students, we can have the available resource to access with the use of technology. It's a useful tool that is used (P11:12)
Makes research easier	Google helps us research information for anything we need in class (P20:14) The research skills also get to improve as learners also learn to cite the sources properly (P21:47)

Integrated discussions and interpretations

The participants reported the resources available to them helped with the successful integration of technology in the school. They mentioned the availability of technicians to help them in case of a technical problem. They also mentioned their laptops and cell phones that they used to search for information. Other resources available included desktop computers at home, iPads, iPods, Kindles and school desktop computers. The participants stated that one of the most important advantages of technology integration in a classroom was the easy access to information on the internet. This is in line with the statement by Leu Jr (2002) that the greatest advantage of the integration of technology is the easy and quick access to the best information in

order to solve important problems. In addition, the learners were able to search for additional information on a given topic discussed in class while they could also broaden their knowledge and acquire extra information to help them to understand the work better. It was also easier to do research because of their laptops and internet access. Strauss & Howe (2000) reported that learners in the 21st century rely heavily on the internet for help with homework, gaming or information on a new product. According to Kereluik et al. (2013), research skills, digital fluency and the responsible use of technology are vital knowledge tools necessary for the 21st century.

This section discussed the speed and ease that technology provides with the general day to day academic related activities in a class. The learners reported that there are both positive and negative aspects to dependency on technology. Two distinct categories emerged, namely, the easy and timely access to large amounts of information which could then be used effectively to solve complex problems, and the rate in which these problems could be solved. Research skills and digital fluency vital skills for the 21st century although it is essential that moral and ethical considerations regarding the use of technology also be taken into account (Kereluik et al., 2013).

The next section examines the different views on the pedagogical knowledge (PK) as displayed by the teachers and the learners, which emerged from the data-collection instruments.

4.5 Pedagogical knowledge (PK)

In this section I discuss the influence of technology on teaching and learning. PK refers to general pedagogic activities (Koehler & Mishra, 2009). If a teacher is deemed to have PK, it implies that the teacher has knowledge of cognitive, social and behavioural theories and knows how learners learn. PK includes teaching methods, assessments, classroom discipline, teaching approaches, learners' prior knowledge, enriching gifted learners, extra support for weaker learners, differentiation, educational purposes, aims, teaching strategies, lesson planning and so forth.

4.5.1 Focus group discussions with the teachers

Three categories of PK stood out in the teachers' discussions in the focus group. They include *teaching instructions* (11 codes), *interaction and collaboration* (15 codes), and *individual learning* (14 codes), as illustrated in Table 4.15.

Table 4.15: Categories of pedagogical knowledge (PK) that emerged from the focus group discussions

Pedagogical knowledge (PK)	Codes
Different styles of learning	7
Effective learning	6
Feedback	5
Individual learning	14
Interaction and collaboration	15
Teaching instruction	11

4.5.1.1 *Teaching instructions*

The teachers were of the opinion that technology enhanced their teaching, with poetry and literature study coming alive with the use of technology. Creative written tasks and oral presentations are examples of the successful use of technology in the classroom. All visual images could be uploaded on the Smart board with sounds making teaching so much easier. The teachers commented:

> Learners developed visual skills because the internet has a lot of visual information, with the smart board everything can be uploaded easily. (P21:83)

> … try to make lessons fun by using the best technology that will enhance the specific subject matter. (P21:94)

The integration of technology in the classroom made the work more authentic. Learners are linked to the outside world and their general knowledge of the world expands. Bringing the real world into the classroom makes learning more meaningful. Furthermore, the teachers reported that their role had changed to that of facilitator, guiding learners to reach their full potential. In addition, the teachers reported on the advantages of Turnitin as a teaching instruction tool:

> Turnitin is interactive between learner and teacher. Also (between) learner and learner. (P21:20)

The next section unpacks the interaction and collaboration in the 21st century FAL classroom that leads to the sharing and building of new knowledge.

4.5.1.2 *Interaction and collaboration*

The teachers were of the opinion that Turnitin provided opportunities for individual communication and interaction between the teacher and the learner. Technology also helped with snapshots that provide a visual image that can provide a focal point of discussions or visual images of the themes in a book. The teachers found that technology helped with the development of interactive skills, both written and oral, while it also helped to address skill shortages when learners work in teams with others. One teacher commented:

> The Turnitin software provides an opportunity for interaction and communication between teacher and learner. (P21:1)

Teacher 3 found communicating in the target language on social media very helpful. This comment coincides with Ellis (2005), who believes that output is as important for acquisition as input. Interaction to convey meaning is the key to language acquisition and opportunities for interacting in the target language must be created. This teacher reflected on the advantage of social media:

> I find social media to be working in the First Additional Language class because the learners are able to help and communicate with each other in the group chats. (P21:100)

According to Johnson (1995), less rigid tasks and interaction are beneficial for second language acquisition. Learners must choose the topic for discussion (Ellis, 2005). Van Lier (1996) suggests more autonomy for the learners. In the study, the learners were situated in a natural environment and were able to chat to each other in the target language. The online collaboration consequently benefited the whole group and was not restricted by time or place, making it convenient, and saving time and money.

4.5.1.3 *Individual learning*

The teachers reported that technology widened the scope of oral presentations as well as ideas for topics for oral and written tasks. By giving a broad topic and giving learners the freedom to decide on their own specific topic, individual needs were addressed. One teacher commented that individual audio recorded feedback also helped with developing listening skills:

> I enjoyed the listening skills that are also developed because of the audio individual feedback via earphones. (P21:22)

Turnitin helped learners to receive individual attention as a result of the individual feedback received and the listening skills developed. Active engagement with content leads to learners taking ownership of their own learning and their learning progress (Scardamalia & Bereiter, 2003). Low achieving learners benefited from the organising of factual information and the colourful illustration of concepts (Nowaczyk, 1998). Learners have more confidence when they direct their own learning, which is beneficial for FAL learning.

4.5.2 Semi-structured interviews

In contrast to the three categories that transpired from the teacher's responses with regard to PK, only one category stood out in the semi-structured interviews with learners – that is, individual learning with 84 codes (see Table 4.16).

Table 4.16: Categories that emerged from the semi-structured interviews

Pedagogical knowledge (PK)	**Codes**
Different styles of learning	24
Effective learning	66
Feedback	52
Individual learning	84
Interaction and collaboration	44
Teaching instruction	8

4.5.2.1 *Individual learning*

The learners reported that the large amount of information available on the internet. Hyland & Hyland (2006a) requires the skill to evaluate information critically and competently. The fact that information is available helps with individual learning because learners can broaden their resources relating to work covered in class, as revealed by this comment in the interview:

> It provides access to different way in which things are done, for example, to search for more work done on a topic will give you more knowledge from different perspectives, thus improving all that you would know on that topic. Technology enables us to find out what we don't know and what we want to know at that very time. (P11:21)

In addition, they reported that technology expands their learning. The fact that they can source any information needed on an individual basis faster helps with their individual progress. Learners are able to look for more information if they do not understand specific subject matter. One learner also mentioned that the teacher can provide websites where they can learn more about the work covered in class. Another comment suggested that individual attention was given to a learner via e-mail. Accordingly, the teacher can e-mail additional exercises or work to learners who need more practice in a specific area (Ferris, 2004). Important private messages can be e-mailed to individual learners. Another learner also commented that technology helps learners with the organisation of their work. Their laptops are their responsibility and as such they have control over the organisation of their files and the information on their laptops. She wrote:

> It helps me to be faster. I can type faster than what I write so therefore its very time efficient. It also helps me be more organised as I sort out all my work and put them in different documents and folders. It also helps me be more knowledgeable as I can Google anything I want to. (P12:9)

The learners also mentioned that specific programs are available to address the need for specific skills. Access to information enhances independent learning. The learners reported that they appreciate the Smart Response Simulator lesson where they can view their marks privately. One learner summarised her appreciation of the individual focus provided by the Smart Response Simulator as follows:

> The successful use of technology in the classroom was the smart board lesson with the small question devices that we got to use to answer questions on poetry. It was good because it showed how much you understood of the poem and afterwards it gave us the correct answer. I liked it because it was different and fun. It was a very beneficial lesson I thought because I also learned lots of new poetry vocab. (P14:12)

The 21st century with its technological explosion has transformed teaching and learning. According to Yu-Mei (2002), the focus of teaching and learning is active, learner-centred, self-directed and collaborative. Teachers are taking a more de-centralised role as facilitators and guide the learners to take ownership of their learning. Moreover, the focus is on the skills that learners need to acquire to develop competencies that will help them to cope with the demands of the 21st century.

However, a thorough knowledge of the discipline is still vital in order to acquire the different skills. The shift to skills rather than content is also the result of the large amount of information that is readily available on the internet.

4.5.3 Reflective blog entries

Three categories emerged regarding PK in the reflections in the learners' blogs. These included feedback (35 codes), interaction and collaboration (29 codes), as well as effective learning (26 codes) (see Table 4.17)

Table 4.17: Categories that emerged out of the blog entries

Pedagogical knowledge (PK)	**Codes**
Different styles of learning	4
Effective learning	26
Feedback	35
Individual learning	18
Interaction and collaboration	29
Teaching instruction	4

4.5.3.1 *Effective learning through feedback and communication*

Learners reported that they preferred individual feedback and a focus on their errors so that they could learn from them. In this way, they are able to correct the mistake, learn from the mistake and not make the same mistake again. The learners reported that they learn and understand better after identifying and correcting their own individual errors. They appreciated the individual feedback and the ability to correct their errors and learn from them, as reflected in the statements below:

> I love that I can get individual feedback for essays because that is what I need, it improves my bad habits that I have had for many years without being corrected. (P20:16)

> This was a very cool experience because it gave us individual feedback on the essay we did and the areas in which we could improve on and I thought this was really helpful and since our marks and the comments were posted online it is easy for us to easily access it and refer back to our mistakes so that we can know where we went wrong and how we can correct our mistakes. (20:161)

These findings do not support the opinions of Krashen (1982) and Truscott (1996) who maintain that written corrective feedback (WCF) has no place or value in second language acquisition. Indeed, Truscott (1996) argues that corrective feedback (CF) is harmful to language acquisition. In the 1970s and 1980s, language acquisition (Krashen's theory) was supported by positive evidence, therefore there was no room for CF and focusing on errors were seen as damaging to the acquisition of a language. Chandler (2003), however, proved Truscott wrong by showing that, with CF, the accuracy of learners' writing increased in just 10 weeks.

Chandler (2003) concludes that error feedback is necessary for learning. Learners must address their errors in order to help them to improve the accuracy in their writing. Van Beuningen et al. (2012) also showed convincing evidence that improvement in both grammatical and non-grammatical accuracy was possible with comprehensive CF. Hattie & Timperley (2007), Hounsell (2003) and Van Beuningen et al. (2012) acknowledge the decisive role that feedback plays in teaching and learning, while Bitchener (2008) has proved that there is an improvement of a limited range of grammatical structures with CF.

The learners reported that they enjoyed the chatrooms. Chatrooms provide a platform for language acquisition, where learners are forced to speak in Afrikaans in a relaxed natural environment with low levels of anxiety and high motivational levels. Active engagement leads to self-directed learning and the social interaction enhances learning (Vygotsky, 1978). Learners enjoy collaborative learning where ideas are shared. The whole class was involved in the discussion and shared their errors with each other. The learners also enjoyed group work and appreciated the help with the correction of their errors given by the more capable learners and the teacher; this is consistent with Vygotsky (1978). Vygotsky (1978) believes in social interaction for learning while Krashen (1982) believes the best way for language learning to take place is in a relaxed natural environment where learners are encouraged to communicate in the target language.

The learners also reported that they understood and remembered the work so much better when using technology. One learner wrote:

> Technology can have a positive influence on the way I learn as interacting with my fellow pupils and the smart board help me to the remember the

> work better and have a better understanding of the work done in class. (P20:84)

The atmosphere in the class is conducive to second language learning. The learners reported that they laughed more in class and that the class discipline did not need to be too strict. There were clear boundaries and learners were free to ask questions or give their opinions.

This section looked at the reflections in the learners' blogs relating to the integration of technologies in FAL lessons. The decision to integrate technologies into lessons was brought about by the technological changes that have taken place in the world. In these blog reflections, the learners focused on the reason why technology is generally developed; namely, to lighten the human workload. The learners reported that tasks were completed in a shorter time and more effectively. Technology made learning easier; getting things done faster and more effectively. More could be done in the available time and the work was neat and legible. Learners also reported that they benefited from collaborative learning because they shared their errors in their writing and help each other to correct them. In addition, they mentioned the collaboration, interaction and co-creation of new knowledge that social media provides. Furthermore, learners focused on the effective learning that transpired as a result of the active engagement with content.

4.5.4 Observations

The previously observed category, *interaction and collaboration (53 codes),* was clearly evident in the classroom observations (see Table 4.18) and will now be discussed.

Table 4.18: Categories that emerged from the observations

Pedagogical knowledge (PK)	Codes
Different styles of learning	20
Effective learning	27
Feedback	8
Individual learning	30
Interaction and collaboration	53
Teaching instruction	14

4.5.4.1 *Interaction and collaboration online and offline*

The learners interacted with each other in chatrooms and, in another chatroom, with boys from another school. The content of the chatroom was projected on the Smart board and was visible to the whole class. Everyone could follow the conversation in the chatroom, even me. Collaborative learning was taking place because the learners communicated in the target language, acquiring new vocabulary and communicating in the target language; this concurs with what Murugesan (2007) asserts; namely, that Web 2.0 technologies use the web more interactively and collaboratively and promote more peer social interaction and collective intelligence. This interaction in the chatroom supports the notion of Krashen (1982), who found that second language acquisition occurs unconsciously.

The learners immediately grouped themselves together in their own friendship circle. This circle also provided help and support with vocabulary and sentence structure. The learners who were often shy about talking opened up and chatted with the help of the more capable learners. According to Maurino (2007), the purpose of the expert in the zone of proximal development is to guide or facilitate the novice to reach the end of the zone, that is, to reach his or her full potential.

The conversation in the chatroom was projected on the Smart board and the other learners followed the conversations and enjoyed the interaction with the boys. Other chats in other lessons in the classroom helped learners with vocabulary; consequently they were learning while the rest of the class was reading their prescribed book and chatting about the book (Umstead, 2012). This forced the learners to pay attention and read because they had to comment on the book and the characters. In addition, the learners were active in lessons where technology was integrated. They contributed to the learning in class by using the Smart board to give their input to the rest of the

learners in the class. The learners learnt by interacting with the technology and subject matter.

The Smart Response Simulator provided opportunities for individual responses. Instead of just asking verbally for opinions, the use of the Smart Response Simulator resulted in everyone giving their opinion. Although learners were using the Smart Response Simulator for the first time, they did not appear to be scared of the technology, rather they embraced it. They played around and used it as a cell phone. The class atmosphere was very relaxed and it was evident that learners enjoyed the interaction and collaboration. For one Turnitin feedback lesson the learners were asked to form small groups. In these groups, the learners interacted with other learners, the teacher and a more capable peer physically in the class as well as online on the Turnitin discussion board. It was evident that learners felt relaxed and comfortable in the class and they welcomed and enjoyed the collaboration and teamwork activities (Cramer, 2007).

Looking back on this data-collection instrument, the interaction and collaboration, the class discipline as well as the experience of the learners in technology-integrated lessons was discussed. The collaborative learning and the guidance of the more capable peers and the teacher in the learners' zone of proximal development (Vygotsky, 1978) were detailed and presented. It became evident that technology excites learners and that they embrace technology. The engagement with technology is second nature to them.

In conclusion, in this section PK was discussed. Possible advantages of the integration of technology in the FAL class with regard to the PK can be summarised as follows:

- Learning is active, learner-centred, and collaborative.
- New emerging learning styles such as collective reflection, guided mentoring, communal learning and personalised learning experiences are accommodated.
- The use of technology enhances independent learning.
- Individual attention is given to learners via e-mail or social media.
- Additional exercises are given to those who need them for more practice.

I will now discuss the theme that emerged from the pedagogical knowledge (PK) related to this inquiry: *the transformation of teaching and learning* in the 21st century FAL classroom. The section will cover the aspects revealed during the data analysis process which focused on teaching instruction, effective learning and interaction and collaboration.

4.6 Theme that emerged from the pedagogical knowledge (PK)

4.6.1 Theme 4: Transformation of teaching and learning

The categories relating to the transformation of teaching and learning are presented in Figure 4.12. Both the theme and the categories resulted after the inductive coding process.

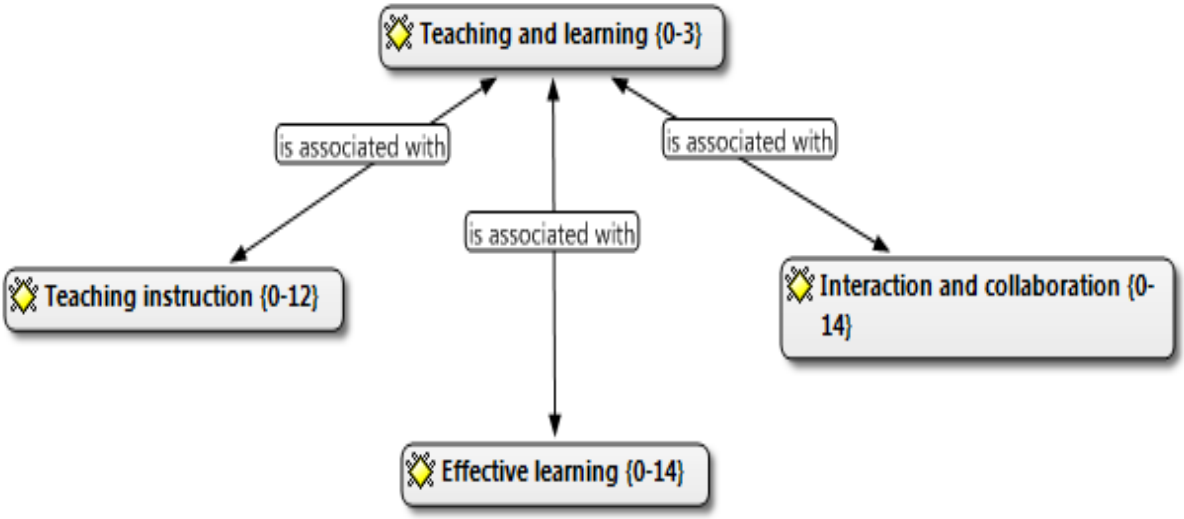


Figure 4.12: Categories relating to transformation of teaching and learning

Transformation of teaching and learning emerged as the core theme with the expanded categories of teaching instruction, effective learning and interaction and collaboration. The theme with its related categories will be discussed in more detail and supported by empirical evidence. Constant comparisons will be made with relevant literature to guide the interpretation of the data collected.

4.6.1.1 *Teachers as designers of authentic, technology-integrated curriculum based lessons*

Mishra & Koehler (2008) noted that the majority of technologies are designed for the corporate world. Thus, teachers have to adapt existing technologies to integrate them effectively into lessons in order to attain pedagogical goals. Teachers are in the best

position to design technologies for specific subject matter. As illustrated in Figure 4.13, the following five sub categories emerged from the category of teaching instruction, namely, work is authentic, enhanced teaching, improved teaching and learning, scaffolding of information and the teacher is a facilitator.

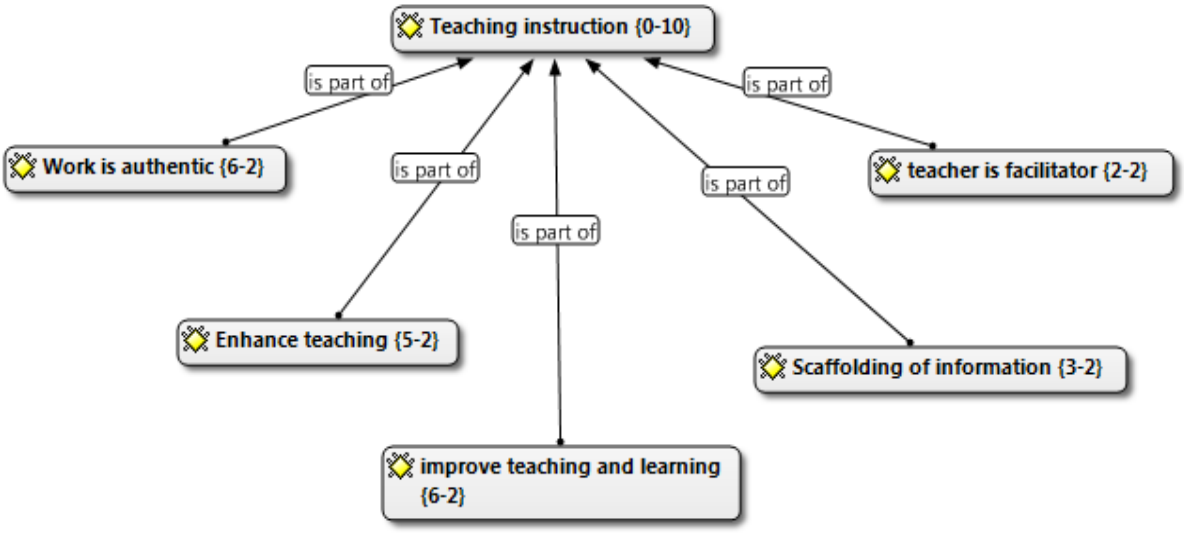


Figure 4.13: Sub categories relating to the category: teaching instruction

Table 4.19 presents an overview of the evidence provided in support of the category of teaching instruction.

Table 4.19: Codes and typical quotations for the category of teaching instruction

Code	Quotations
Work is authentic	Real life situations are incorporated into lessons and, by doing so, the contents are more meaningful to learner (P21:92) Benefits: links us to the world out there, the reality of the day and expand general knowledge, using it as a starting point (P21:39) Technology is really helpful as the audio and visuals allow people to apply the conversations to real-life communication (P4:9)
Enhanced teaching	It will enhance your teaching abilities and help you connect with your students in a completely different way (P9:35) I use technology in my classroom as a tool to enhance teaching (P21:2) Interactive technology enhances a more positive learner attitude towards Afrikaans. The environment in the Afrikaans class becomes more interesting and interactive with technology lessons. Technology can be used successfully with creative written tasks and oral presentations. Poetry and literature come alive (P21:67)
Improved teaching and learning	Yes, as it would provide a larger source for students and teachers to improve learning and teaching (P11:28) I think that technology has a very large benefit in the classroom (P20:143) The use of technology in class helps us to attain all the skills that are required by the curriculum (P21:77)
Scaffolding of information	It was very helpful to see how much you understand on your own and to see how you can actually understand more than you think you can (P20:99) The explanation after the exercise brought everything together to help me understand and learn from the poem (P20:106)

Teacher as a facilitator	Teaching style changes, I become the facilitator and learners become more independent (P21:69) Teaching style facilitator guiding and helping allows them to develop and helps them to develop the ability to choose technology that best fit into the content and pedagogy (P21:95)

Integrated discussions and interpretations

According to the National Curriculum Statement Grade R–12 (Department of Basic Education, 2012) learners in Grade 10 should be reasonably proficient in the First Additional Language but, unfortunately, this is not always the case. Akinnaso (1993) highlights the fact that first additional language proficiency depends on a well-developed first language proficiency. However, the National Curriculum Statement Grade R–12 departs from the traditional approach that learners must first master their home language before they start learning an additional language, stating that learners must embark on second-language reading in the middle of Grade 1. However, the reality is that learners in South Africa speak different languages and, in most cases, their home languages differ from the language of teaching and learning. Despite the fact that learners enter the classroom with different levels of proficiency in Afrikaans FAL, it is expected that the learners will achieve the same outcomes by the end of Grade12. As illustrated in Table 3. 1 in Chapter 3, I was faced with the dilemma of learners with different FAL proficiencies. In addition, there are also learners who enter the FAL classroom with no vocabulary in the target language, although the learners who started in Grade 1 have usually acquired a fair amount of vocabulary. Owen-Smith (2012) revealed that early exposure to an additional language is beneficial for learning a language.

4.6.1.2 *Meaningful, collaborative and technology-rich learning*

Zhang (2010) indicated that there was a great need for learners to employ technologies in their own learning. Effective teaching results in effective learning. Thus, technology must be utilised in the best possible way to attain the pedagogical goal set out in the lesson. As illustrated in figure 4.14 the following seven sub categories relate to effective learning, namely, greater efficiency, work improvement, better quality, more confidence, more organised, learn more with technology and classroom atmosphere.

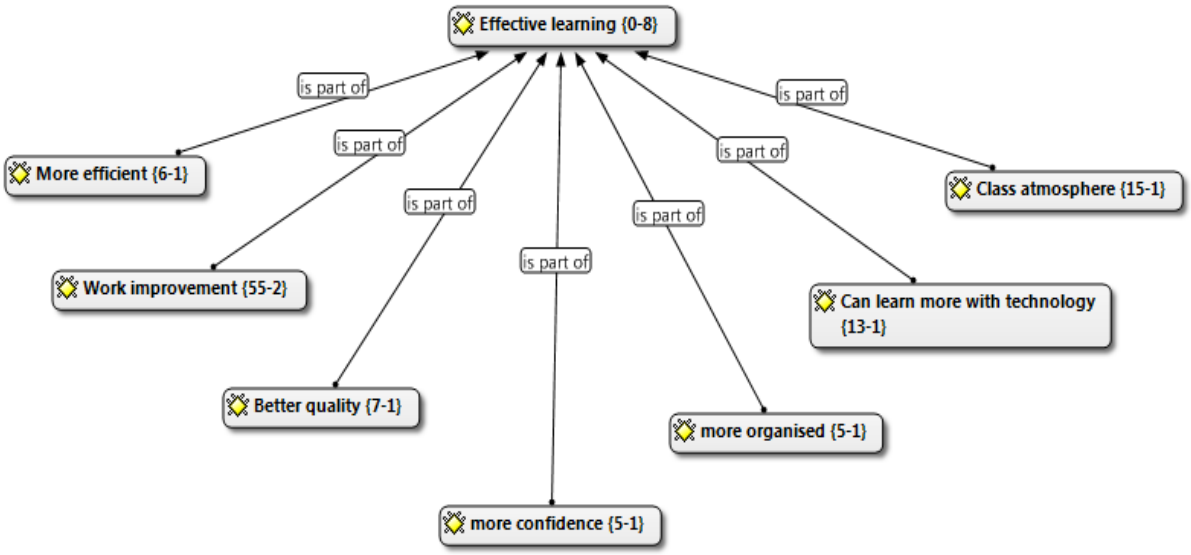


Figure 4.14: Sub categories relating to the category: effective learning

Table 4.20 presents an overview of the typical evidence provided in support of the category of effective learning.

Table 4.20: Codes and typical quotations for the category of effective learning

Code	Quotations
Greater efficiency	A positive experience with technology would be that it is an effective way of getting things done (P17:34) The use of technology in class is a very effective way of getting work done and accessing information on the school website that teachers have put on for us (P17:40)
Work improvement	Technology can have a positive influence on the way I learn as interacting with my fellow pupils and the smart board help me to the remember the work better and have a better understanding of the work done in class (P20:84) Technology has a positive effect on my learning as I am able to remember work more clearly and accurately after having an interactive lesson with technology other than having an aural lesson (P20:107) Yes, I think that it makes learning easier and more enjoyable (P3:31) Makes it easier to learn (P4:10) It really helped me to grasp and understand everything very well (P20:45)
Better quality	This is because it makes it easier to produce better quality work in a shorter period of time (P4:2) My laptop, I use my laptop as needed to hand in such as assignments, Google translate or Turnitin, the goal is to get the work done more accurately and quicker as well as to teach us new skills in Afrikaans, helps us with Afrikaans and, yes, I did as it makes me realize the mistakes I have done in my work and to fix them and not repeat them (P18:21)
More confidence	I believe that in our times as teenagers, we are exposed to technology a lot more than people were, way back when. Technology gives us an opportunity to show our intelligence in a different field. It gives some people more confidence in the work that they are doing (P9:1) We may not be the best at reading out of our book, or having the best sentence structure but, when technology gets brought in and we're good at it; we achieve more confidence in what we are doing (P9:13) I, for one, feel more comfortable and confident when technology is used because I feel it gives me a chance to show myself in a different light (P20:117)

Code	Quotations
More organised	It helps me to be faster. I can type faster than what I write so, therefore, its very time efficient. It also helps me be more organised as I sort out all my work and put them in different documents and folders. It also helps me be more knowledgeable as I can Google anything I want to (P12:9) Everything is faster. Everything is organised. Everything is modern (P12:10)
Can learn more with technology	The smart board response systems, we answered poetry questions on them. I found the lesson very interesting and I think that I learnt a lot from them (P3:16) A positive experience with technology is when you easily access a website and learn a lot from it in one single step e.g with Twitter informative facts (P4:16) They should do it. It helps the students learn faster and learn for different sources (P6:30)
Classroom atmosphere	It is enjoyable to do something different and it brings a cheerful, happy vibe in our classroom (P9:15) Technology is interactive and allows the class to be more sociable in an education sense (P10:3) With the technology being used, the class seems to get along better and laugh more (P20:17) In general the class atmosphere is very good though and is quite fun (P20:39) It is a relaxed and flexible learning atmosphere but also strict because technology can be very distracting to the learners (P21:86)

Integrated discussions and interpretations

Zhang (2010) reported a great need for research on the way in which learners can employ technologies in their own learning. Technology affects the way in which learners learn with learners tending to work more independently and take responsibility for their own learning. Learners engage with their individual WCF and correct it with the use of the quick mark comments, capable peers and the teacher by interacting on the discussion board. Learners work collaboratively, either in small groups or individually, moving away from the traditional whole class teaching. Individual learning is promoted and individual needs are addressed with Turnitin and the individual WCF. The learning process on the discussion board of Turnitin is active, collaborative and learner-centred to address individual needs (Yu-Mei, 2002).

The participants felt that they were more organised and more efficient than may otherwise have been the case and that this resulted in more confidence. Walker & Reece (1997) and Shulman (1986) believe that highly motivated learners learn more effectively in the second language acquisition process compared to less motivated learners. Shabitha and Mekala (2013) agree that motivation is a key factor in second language acquisition. Learners learn more with the use of technology because technology enriches and extends their learning. Technology increases the possibilities and leads to better quality projects and assignments. The learners also felt that they were being catered for individually. In addition, technology helps to create

opportunities to address various styles of learning. It is essential that teachers adopt a more flexible approach to the curriculum than is currently the case and they allow learners to be part of the curriculum design process. Some of the learners appreciated the visual learning that technology brings into the classroom. Learners in this century are constantly listening to music and they tend to prefer audio assignments or audio feedback from the teacher. Learning is more interesting with technology and this motivates learners to do their best because they enjoy doing tasks with the aid of technology (Brown, 1977). The learners reported that their work improved because they found that they learnt more easily and they understood and remembered the work so much better (Brownlee-Conyers, 1996).

The learners reported that the class atmosphere was more relaxed and flexible, that they laughed more and that it was more sociable in class. Both the classroom atmosphere and class discipline are essential for learning. According to Gagnon & Collay (2006), it is important that the classroom setting and atmosphere encourage communication between learners and teachers. It is also important that the learners feel accepted and free to make mistakes in a first additional language classroom (Krashen, 1982). It is only by creating a free and relaxed atmosphere and a classroom setting that encourages co-operative learning that the learners will be encouraged to make contributions to discussions during lessons. In addition, such classroom conditions will facilitate autonomy of learning with the learners taking responsibility for their own learning. It is vital that the classroom atmosphere in a second language class is not too strict because learners need to feel safe and they have to make mistakes in order to learn. Brown (1977) states that learners who are not scared to make mistakes are usually successful in their second language learning. Learners must feel free to ask and to learn from their peers. It is, however, also important to note that technology may easily distract the learners and that it must be closely monitored.

4.6.1.3 *Sharing and building knowledge through interaction and collaboration*

As illustrated in Figure 4.15, the following five sub categories emerged from the above category, namely, collaboration, interactive learning, interaction with other learners, interaction with the teacher, and learning from other people.

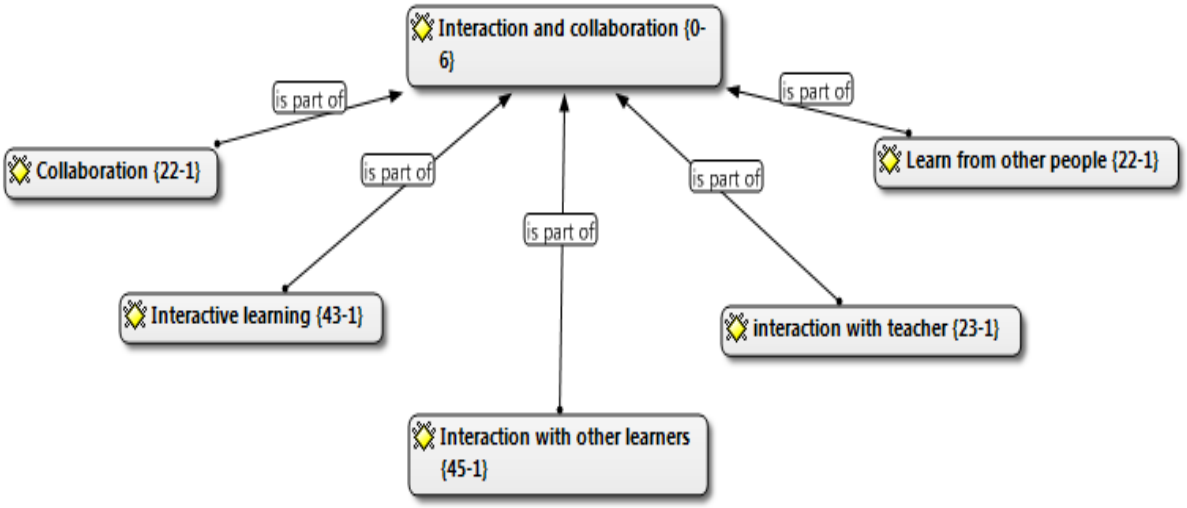


Figure 4.15: Sub categories relating to the category: interaction and collaboration

Table 4.21 presents an overview of the typical evidence provided for the category of interaction and collaboration.

Table 4.21: Codes and typical quotations for the category of interaction and collaboration

Code	Quotations
Collaboration	We also often access a chat room to share ideas regarding the poem or novel we are currently studying, we also make contact with other schools, to share opinions on the use of technology.(P20:42) Interested to see other people's opinions (P8:5) It was nice that the whole class was involved in the lesson and that the whole class contributed to the lesson (P20:41) Learners are able to collaborate successfully using the group chats and this benefits a lot of them (P21: 101)
Interactive learning	It promotes the interactive learning which improves my Afrikaans (P1: 29) The interactive lesson with the smart board was useful as it forced us to participate in class and also the process of revealing the answers was sped up, allowing us to cover more of the terminology (P7:1) Interactive smart board lessons help keep me focused (P7:16) When technology integration is at its best, a child or a teacher doesn't stop to think that he or she is using a technology tool, it is second nature. And students are often more actively engaged in projects when technology tools are a seamless part of the learning process. When technology integration in the classroom is seamless and thoughtful, students not only become more engaged, they begin to take more control over their own learning, too (P9:37)
Interaction with other learners	The interactive lesson with the smart board was useful as it forced us to participate in class and also the process of revealing the answers was sped up. allowing us to cover more of the terminology (P7:1) Most of us were interested to see other people's opinions and give our own opinions so we were more involved and focused while we were reading (P8:6) Peer learning benefits my learning as seeing other learners' mistakes and those learners showing me mine help me to improve my Afrikaans (P20:24)

Code	Quotations
Interaction with teacher	It will enhance teaching abilities and help the teacher to connect with the students in a completely different way (P9:35) It helps me a lot because it is an easy and simple way to communicate with my teacher or class via emails if I am not sure of something we did in class. It helps you to stay updated and know exactly when tasks should be handed in (P17:31) The Turnitin software provides an opportunity for interaction and communication between teacher and learner(P21:1) There is a lot of passion and support from the teacher and this excites us to try new things and learn (P20:11)
Learn from other people	By learning from other people who know what they are doing when it comes to technology and computers (P5:11) I acquire these skills also from the people around me and, the more I use my laptop, the more I get to know what I can do with it (P8:12) My mom taught me most of what I know on the computer. She worked on the computer all day, every day, so I got most of my computer skills from her. Also, school offered me the opportunity, in grade 8 and grade 9, to learn more about little things I didn't understand or I never knew existed. School has been a giant part in my learning computer skills (P9:3) Helps me learn through other people's mistakes and my own (P1:28) Sharing our mistakes also helped as I could see the similar mistakes that I made, therefore, I have learnt from my mistakes (P20:133)

Integrated discussions and interpretations

According to Vygotsky (1978), learners learn from capable peers. The use of the discussion board on Turnitin enabled the learners to feel free to learn from each other because everyone shared their mistakes and they learnt from each other (Umstead, 2012). However, this observation contradicted the theory of Krashen (1982) that the learners' affective filters are raised when they focus on grammatical structures and they develop a fear of making mistakes when they communicate in the target language. By contrast, this study showed that the learners learnt from each other by interacting, sharing their mistakes with each other and helping each other to correct their mistakes. In addition, the learners enjoy chatting to each other because they liked to interact with one another and this makes learning fun and enjoyable (Dede, 2005). By chatting to each other in a chat room the learners acquired the language naturally (Krashen, 1982).

Technology also provides an opportunity for individual learning (Nelson et al., 2009). Learners are able to receive individual help and support via email and this saves both time and money because learners do not have to be physically in contact with the teacher. Some learners are shy to ask questions in class and emails enable learners to ask individual questions and receive individual attention. The use of technology means that more learners may be reached than would otherwise be the case and

face-to-face interaction is reduced. In addition, more interactive learning took place with the integration of Turnitin with learners being able to ask questions to either other learners or the teacher on the discussion board.

This section discussed aspects of pedagogy and touched on the sub categories related to teaching instruction, effective learning as well as interaction and collaboration. The participants described the impact of the rapid advance in technology on teaching and learning and highlighted the need for the continuous renewal of pedagogic strategies. The role of the teacher as a coach and a facilitator was discussed. The application of Turnitin in the FAL class and the collaborative learning platform provided by the discussion board opens up new opportunities for collaboration and the creation of new knowledge. The learners' progress and their interactions with other learners and the teacher can be monitored on the web.

4.7 Learners' perceptions versus teachers' perceptions

Figure 4.16 shows the categories that emerged from the various data gathering instruments that were used to obtain the perspectives of the learners and the teachers. Moreover, it illustrates not only the way in which the categories elicited from the different data-collection instruments differ, but also how they occur repeatedly in the themes that emerged from the different data-collection instruments, thus illustrating data saturation. What is noteworthy is the rich data that the teachers contributed in relation to both the content and the pedagogy.

The two categories, *technologies and new century skills*, emerged from all the data-collection strategies. *Interaction and collaboration* were crystallised in the blog entries, the video recordings and the focus group discussions. The focus group discussions are valuable in this inquiry because they shed more light on the transformed teaching instruction of the 21st century.

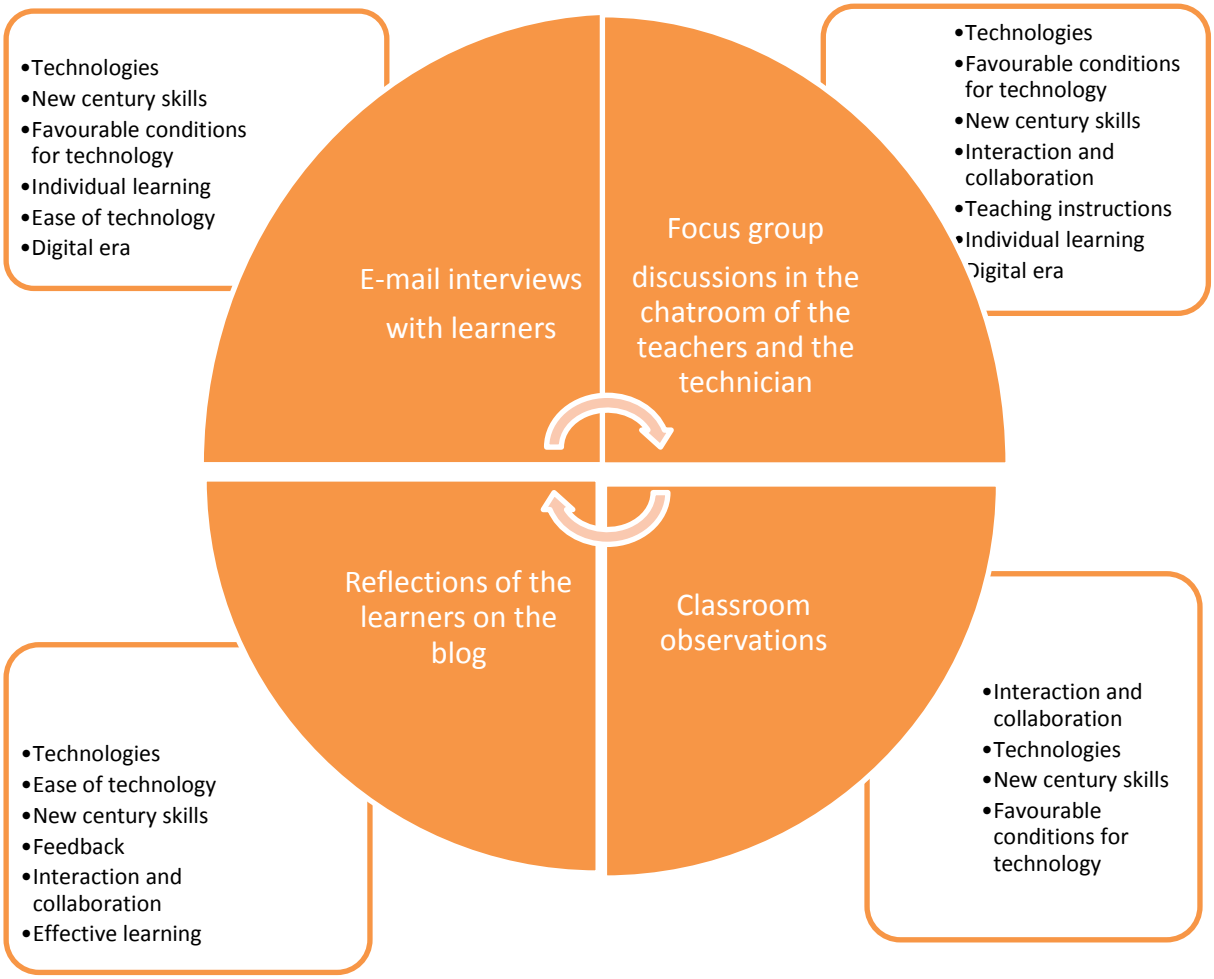


Figure 4.16: Learners' perceptions versus teachers' perceptions

The most important aspect that emerged from the interviews with learners and their blog reflections was the individual and effective learning that was perceived to have taken place as a result of the integration of technology. The learners indicated that they preferred individual written feedback and the active engagement of the feedback to no feedback at all. Learners also highlighted the benefits of social media for language acquisition. The chatrooms provided opportunities for rich input, immediate feedback and interaction with other target language speakers in a natural setting. Another advantage of the integration of technology in an FAL class is the motivation and interest it provides, which is vital for second language learning (Krashen, 1982). Learners also reported that they understood and remembered the content much better when using technology. They added that the class atmosphere "lit up" with the integration of technology because learners enjoyed the lessons.

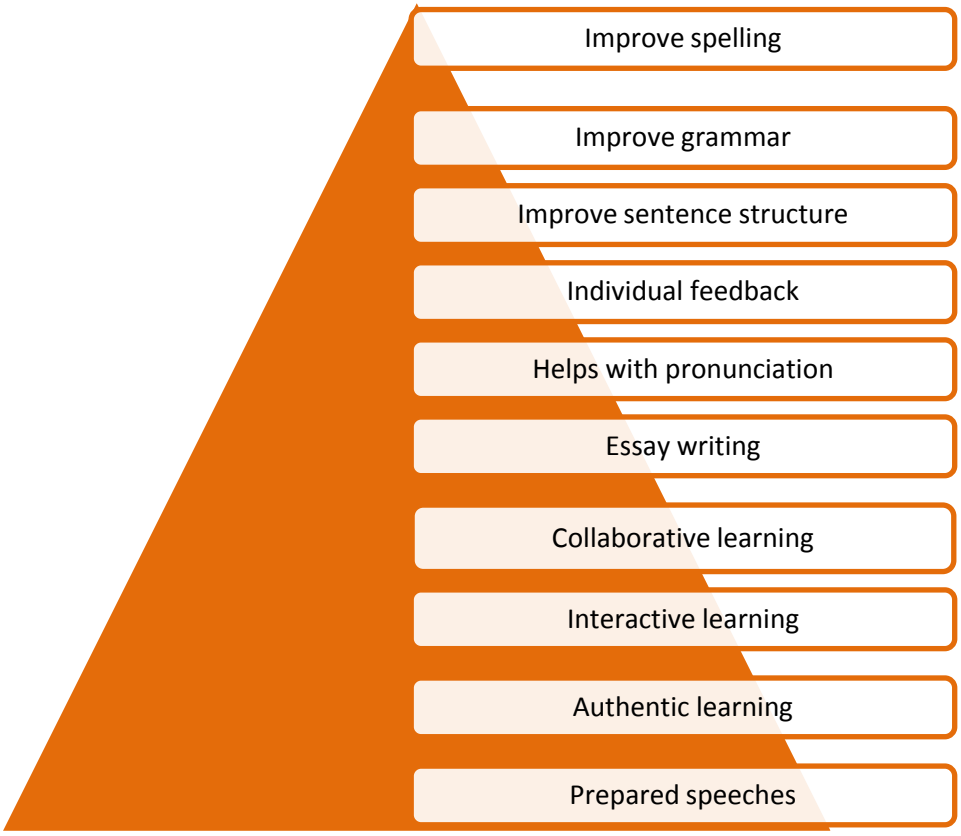


Figure 4.17: Learning experienced with the integration of technology in the FAL classroom

Although the teachers mentioned the advantages of social media, the rich input, the opportunity to communicate in the target language in a relaxed natural environment and the motivation and interest that technology brings, they focused more on teaching instruction and authentic assessment. They reported on both e-assessment as a means to lighten a teacher's tasks and the skills learners acquire with authentic instruction. The teachers and learners acknowledged the need for 21st century skills but the teachers emphasised that teachers have to acquire first before they are able to guide learners to acquire these skills. The teachers reported on their role as facilitator and stated that the availability of information shifted the learning autonomy from the teacher to the learner. However, teachers have to guide learners to take control of their own learning through self-directed learning. The teachers noted that they had had to become lifelong learners in order to stay abreast of technology and to partner with learners in the teaching and learning process. In addition, the teachers mentioned the advantages of the visual and interactive teaching aids available, such as CDs, DVDs and YouTube clips, which help with pronunciation, which is very important in learning an additional language. One teacher commented that technology can enrich the above-average learner and teachers should use it to challenge such learners by

giving them freedom and autonomy to choose their topics and mode of delivery. The learning experienced with the integration of technology is summarised in Figure 4.17.

Both teachers and learners reported that the slow and unreliable internet access was a huge frustration and that it hindered the successful implementation of technology. In addition, they agreed that the digital fluency of both teachers and learners was adequate. The technologies that learners are surrounded with, as reported in this inquiry, are illustrated in Figure 4.18.

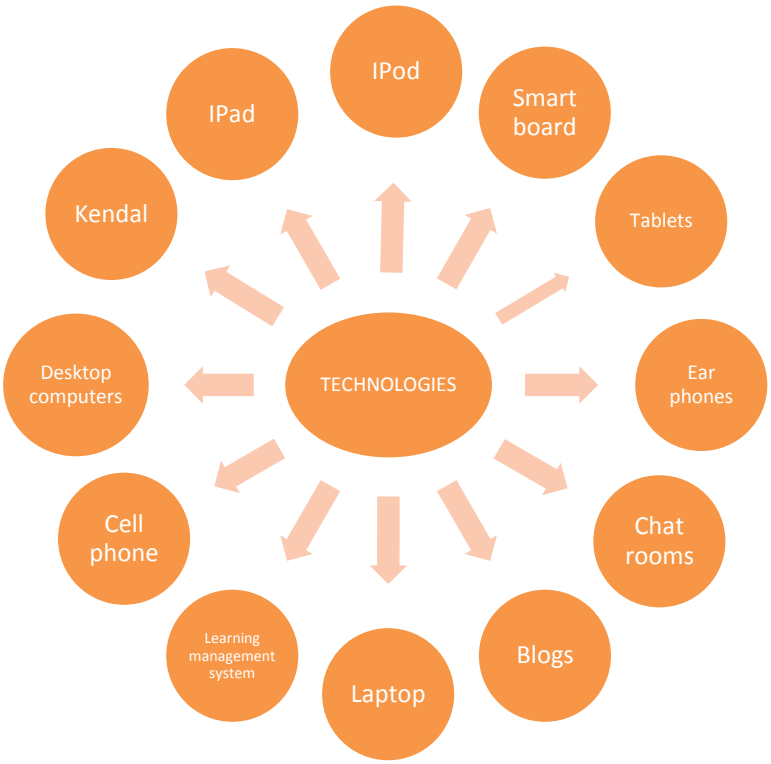


Figure 4.18: Technologies in the digital era

4.8 Conclusion

This chapter constitutes the first part of the data analysis and described how the data gathered were reported and analysed using ATLAS.Ti. The data collection instruments that were used to gather the data in this chapter included the semi-structured e-mail interviews with the 19 learners, the learners' reflections on their experiences of the integration of technology recorded on the blog, the focus group discussions with the four First Additional Language (FAL) teachers and the technician in the chatroom and the observations obtained from the video recordings and the field notes.

Various network views that illustrate the relationships between codes and quotations were generated by ATLAS.Ti. The data gathered underpins the discussion of the data

analysis through the lens of the adapted conceptual framework. The first four themes that emerged out of the analysis of data in this chapter crystallised out of the technological knowledge (TK) and the pedagogical knowledge (PK) of the adapted conceptual framework.

In conclusion, both teachers and learners proved that they were digitally fluent and that digital resources were available in this inquiry. It was agreed that the challenges that were identified could be overcome to harvest the positive aspects of the integration of technology in an FAL class. The favourable conditions for technology integration were discussed and participants demonstrated that the conditions were indeed favourable for the integration of technology in the FAL class. In addition, the school is now already in its tenth year of technology implementation and the use of technology is a norm in the school. According to Valdez et al. (2000), the school is identified as being in stage 3 of technology acceptance, namely, the integration phase, where learners and teachers develop and apply 21st century skills. In this stage, the integration of technology supports the process of teaching and learning. Now, subsequent to this in-depth discussion on the technological and pedagogical knowledge in this inquiry, it had been established that the learners and the teachers are ready for a sophisticated technological application tool; the table is laid for the successful integration of a specific technology to teach specific-subject material effectively, as advocated by (Koehler & Mishra, 2009).

The next chapter begins by looking at the findings that were drawn from the learners' e-portfolios in this netnographic case study. Learners' academic progress was monitored by means of the Grade Mark feature of Turnitin, which gives feedback on the frequency of the errors per portfolio piece, learners' social behaviour and interaction with other learners and the teacher on the discussion board via the Internet.

CHAPTER 5

TURN THE CENTURY WITH TURNITIN

5.1 Introduction

The previous chapter comprised an analysis of the data collected from the 19 e-mail interviews with the learners, the learners' blog entries in which they reflected on their experiences relating to technology integration in the classroom, the focus group discussions with the four FAL teachers and the technician, as well as the class observations recorded on video. Data were analysed separately according to the different data-collection strategies in order to identify the similarities and differences in the teachers' and learners' perceptions. In addition, the data was discussed according to the four themes that emerged from the analysis: the digital century, technology integration, speed and ease of technology and transformation of teaching and learning.

Vygotsky's (1978) zone of proximal development in a language class is clearly evident in this chapter. The data collected from the e-portfolios on Turnitin will be discussed. I reported on the influence of written corrective feedback to address the learner's individual needs; more specifically the learners' attitudes to the individual feedback that I provided via Turnitin are reported on. This section then looks at the grammatical improvement that the learners reported. A detailed account of the errors for every portfolio piece is provided and the progress or lack thereof is explained. Active engagement with feedback on the discussion board where capable peers and the knowledgeable teacher work collaboratively on the discussion board to help other learners are explained. In the remainder of the chapter, the integration of content, pedagogy and technology are discussed as well as the advantages of Turnitin as a valuable tool to address the learners' individual needs.

Lastly, the theme, employment of specific technologies to address the individual needs of learners, which emerged from the technological pedagogical and content knowledge, will be discussed.

This section aims to address the two sub-questions in this inquiry:

- How and in what ways can computer technology be made relevant for today's teaching and learning in a multilinguistic language class in the 21st century?
- How can computer technology be utilised to address every learner's individual learning need?

5.2 Technological, pedagogical and content knowledge (TPACK)

The intersection of content, technology and pedagogy is the quintessence of TPACK (Mishra & Koehler, 2008), and these types of knowledge are needed in order to use technology successfully when teaching. Mishra & Koehler (2007) maintain that technological knowledge and the use of technology help learners to understand the multiple representations of concepts and the PK of constructive pedagogical techniques to meet the individual needs of the learners and the content knowledge of specific content areas that learners find difficult to understand. Thus, these types of knowledge are necessary in order to use technology optimally and to scaffold learner content knowledge that helps learners acquire the concepts.

It is incumbent on teachers to design interesting and challenging activities. However, it is important to note that technological tools do not inform specific teaching methodology and restructuring of content. Technology can merely be used to transform content in order for learners to have a better understanding of the subject matter (Mishra & Koehler, 2006). On the basis of sound pedagogical principles, teachers must choose the technology that can best help the learner to grasp the content (Murray & Barnes, 1998, Levy, 1997). The technology, content and pedagogy must integrate (Yu-Mei, 2002). It is thus very important that teachers scaffold the content because learners can be overwhelmed by the vast amount of information that is available (Vygotsky, 1978).

I will now discuss the integration of Turnitin, an existing plagiarism tool, in the FAL class in order to address the individual needs of the learners.

5.3 Turnitin

In the analysis of the e-portfolios, Turnitin software is introduced. Turnitin is an existing plagiarism tool which, in this study, was used in relation to individual learning through innovative teaching. The interaction and support from capable peers and the teacher in a natural relaxed social environment will be discussed. The benefits of the emerging technologies in relation to the access to available information and expanded learning as well as specific technologies to address specific needs were given.

5.3.1 Introducing Turnitin

Many higher education institutions and some schools are making use of electronic assessments (Brink & Lautenbach, 2011). Brink & Lautenbach (2011) advise that teachers should become informed about such e-assessment systems in order to help learners with any problems that they may encounter in this regard. I used Turnitin to address the different levels of Afrikaans FAL proficiency in my class. For example, I used the Turnitin e-assessment tool to give individual feedback to learners so that the individual needs of the learners in this multilinguistic language class were met. When I first started to use Turnitin software in my FAL classroom, I was very nervous because I was not used to the system. I had attended a Turnitin training session in November the previous year at the University of Pretoria to equip myself with the necessary knowledge and skills before I introduced Turnitin in my Grade 11 FAL class the following year. There were mixed feelings in the class on the day that we first introduced Turnitin in the class; some of the learners were very excited while others were nervous of using Turnitin. Moreover, not all the learners could access the internet to use Turnitin. Fortunately, the learners were used to the poor internet connectivity at school and were very patient. If they were unable to access the system they simply sat next to another learner and shared their laptop. I also noticed that the learners were very supportive of each other. The learners who had no problems in logging on helped other learners who were struggling. I also noticed that the learners were not scared or afraid to ask me or other learners for help. The school was very supportive and encouraged innovative teaching; therefore the Information Technology Manager as the administrator of Turnitin was very supportive, for which I was grateful. Such support encourages teachers to use technology in innovative ways. Despite my insecurity and anxiety, the learners were excited about using Turnitin in class and their attitude in turn made me feel more relaxed and I could enjoy the lesson and look forward to seeing what the outcome was.

5.3.2 Transformed teaching and learning

Learners used their laptops to do essay writing. Heitin (2011) is of the opinion that a gap exists between the real lives of the learners outside school and what is happening inside the classroom. He argues that learners rarely use handwritten reports outside school so why are they still using it in class. I tend to agree with Heitin (2011) and fail to see the value of learners writing in school when they type everything outside school. Digital writing skills are vital for tertiary education as well as for the corporate world after school.

The knowledge and skills needed for the 21st century have changed, with more than enough knowledge being available on the internet. The teacher's role has therefore also changed because all the content is on the internet and is easily available. Learners are used to quick access to information, and teachers need to be aware of the different ways to access or distribute information. Although learners are very good at finding information on the internet, it is nevertheless important that teachers teach learners the skills that they need to function in a continually changing environment. Kereluik et al. (2013) state that owing to the rapid changes taking place in technology, today's 21st century education cannot be exclusively based on technology. Instead, the focus is more on skills than on content, although a thorough understanding of the required discipline is needed before such skills can be applied.

Learners need to be reassured that they are on the right path, especially in the fact of the vast amount of knowledge available to learners. If the teacher does not give clear direct instructions, technology and the overload of information can be daunting to the learners. The learners agreed that technology was a great help for school projects. Mishra & Koehler (2008) encourage teachers to use existing technology innovatively and creatively in class, as the knowledge is available and the visual presentation makes school projects and assignments much easier and faster. Participants reported that teaching with technology enhances the teaching process. It is also very helpful when teaching languages especially with the spelling of words. (Gordon et al., 2009) argue that learners become co-creators of the curriculum design because they know what they want and enjoy, and they are always up to date with the latest technologies.

In the 21st century, the role of the teacher has changed to become more of a facilitator who guides learners to reach their goals. Nelson et al. (2009), Angeli & Valanides (2009) and Yu-Mei (2002) all agree that a teacher's commitment is vital in successful

technology integration. Teachers should change their vision of the curriculum and should move towards authentic instruction and assessment for individualised teaching (Cramer, 2007). The coach and the facilitator value collaborative projects and authentic activities; they encourage learners to take ownership of their own learning.

When I used Turnitin in the FAL class, I followed a constructivist approach in terms of which learners constructed their own knowledge from their errors. I guided the learners to identify their errors, which they in turn corrected with the help of the quick mark comment, as well as both capable peers and the teacher on the discussion board. This helped them to learn from their mistakes and to take responsibility for their own learning.

5.3.3 Addressing learners' individual needs

Individual needs are addressed using WCF. Accordingly, collaborative platforms such as the discussion board on Turnitin are extremely useful for language learning. Garrett (1991) considers interaction in the target language in a real context to be extremely important and views it as one of the most effective ways of learning a second language. In this way, learners are forced to think, speak and write in the target language and cannot hide away; hence, the target language is acquired spontaneously (Rueckert et al., 2013). Learners were also active in the chatroom discussions, where they were actively engaged in the construction of knowledge and in conversation on a topic. This experience is more meaningful to learners because it is authentic and it provides a platform for communication in the target language (Krashen, 1982).

Learners reported on the effectiveness of Turnitin for addressing the individual needs of learners. As stated in the problem statement in Chapter 1, I was faced with a diverse class with different levels of Afrikaans proficiency which I needed to accommodate. Furthermore, this inquiry was situated in a private school and as such parents primarily enrol their children in such schools because they expect individual attention and high standards of education. Turnitin is very learner-centred because the teacher provides guidance by means of individual WCF; thus the Turnitin experience was described by most learners as a personalised learning experience focused on their individual needs. In addition, many of the learners regarded Turnitin as one of the most successful integrations of technology in the FAL classroom and mentioned that it had helped them to improve their Afrikaans FAL skills. One learner expressed her

appreciation for the highlighting of the specific errors and the help and support received with the correction of mistakes, as can be seen in the statement below:

> Yes, I do think our teacher addresses our individual needs because we have quite a few websites where we hand in tasks or do assignments and these automatically get marked for us and come back with the teachers individual comments on our tasks and tips and advice on how we can improve in that section of work. We can also receive help from our teacher via e-mail in which she can help by forwarding an activity to practise from or scheduling an extra Afrikaans class after school to help you with the things you are struggling with. (P3:40)

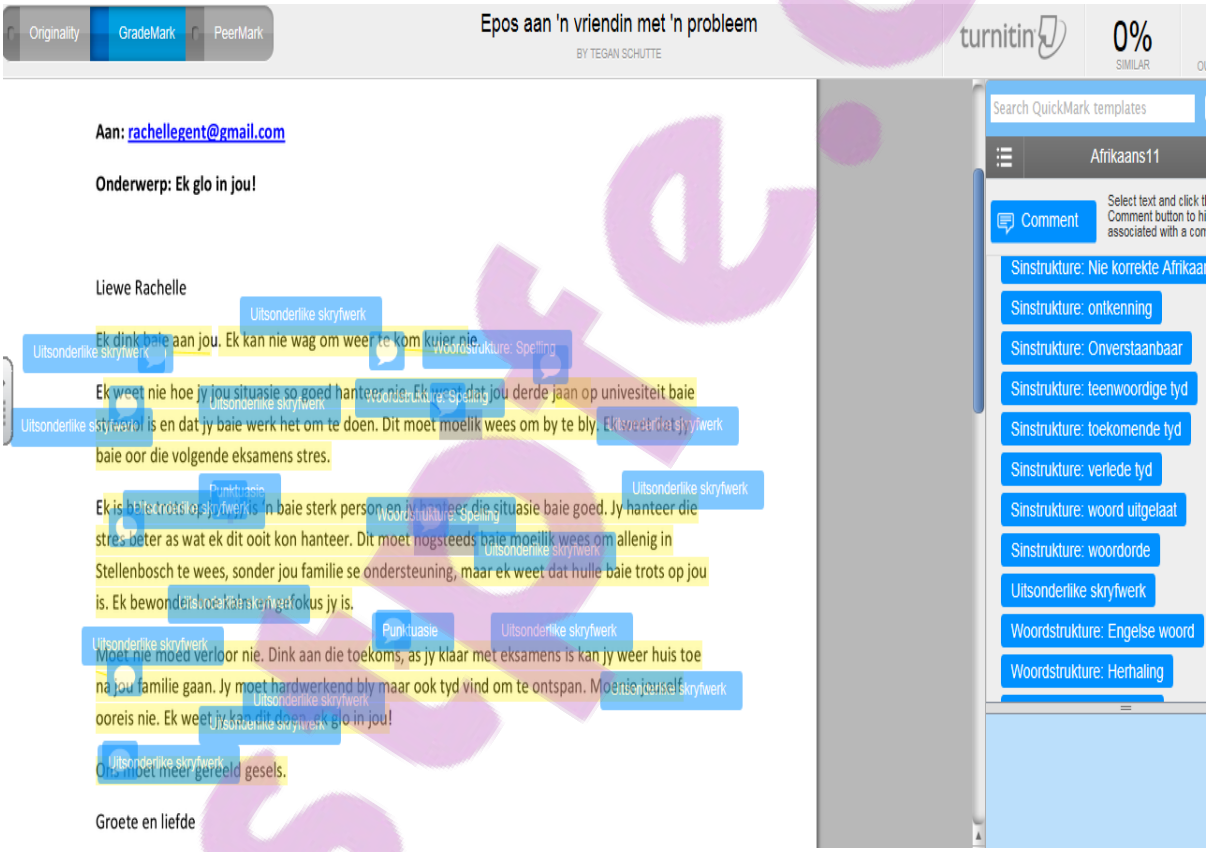


Figure 5.1: E-mail assessed with colour codes and quick mark comments

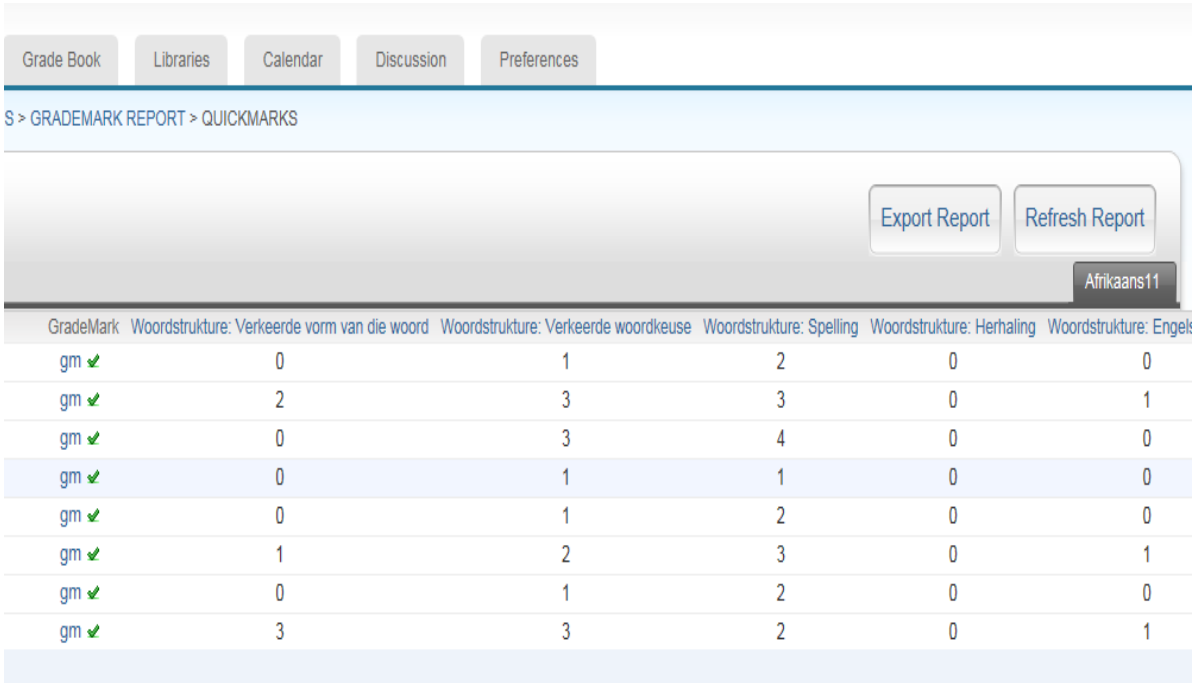
Learners reported that their writing skills and language improved with Turnitin, which confirms the statement made by Rolfe (2011) that Turnitin is very valuable for the development of literacy. As explained in Chapter 3, the learners found the individual feedback on their creative assignments very valuable. They indicated that it was easy to identify their mistakes using the colour-codes in the feedback provided by the Turnitin software program. Kunka (2011) explains how a teacher can customise the

error identification and corrections in Turnitin, making marking so much easier and faster. In the feedback I used different colours to highlight errors in word structure, sentence structure and punctuation, as well as for any outstanding work done (see Addendum A). A sunny yellow indicated outstanding writing, pink highlighted a sentence structure error, blue showed a word structure error and punctuation errors were highlighted in purple. Learners were provided with feedback in a written individual comment and an audio individual comment, making differentiation possible with the aid of technology (see Figure 5.1).

Learners used earphones to listen to my individual audio comment in Turnitin. In this way, individual needs were addressed without making any sounds that could have disturbed the other learners in the class. The feedback works in the following way: When an error is identified, it is highlighted according to the different error categories mentioned above. A quick mark with a full explanation of the applicable grammar rules is also provided as these rules are an integral part of the FAL curriculum. In his five hypotheses theory, Krashen (1982) refers to the role of language in the learning process as that of a “monitor” or “editor”. According to Krashen’s monitor hypothesis, the learner knows the rules and focuses on the form while language acquisition supports natural communication. Wigglesworth & Storch (2012) stress the important role that the quality of “noticing” plays in the processing of feedback. It is imperative that learners focus their attention on correcting their individual mistakes. Two types of noticing feedback can be identified: substantive noticing and perfunctory (superficial) noticing. According to Wigglesworth & Storch (2012), substantive noticing is more effective because it encourages a greater uptake of feedback. Learners need to engage with feedback in order to improve their language learning. Hattie and Timperley (2007) advocate the importance of clear and effective feedback in the learning experience. Subsequently, these authors state that effective feedback is conveyed in a number of ways and thus enough room and time have to be provided for responding and interacting with feedback. In fact, failing to make provision in the timetable for time to engage with feedback is one of the reasons why feedback is ineffective. Gibbs (2006) confirms the importance of active engaging feedback. He advocates that learners should take control of their own learning by firstly taking control of their feedback. Teachers should step back and stop controlling the feedback process, allowing learners to continuously reflect and assess their work and play an active role in the feedback process.

5.3.4 Active engagement with feedback

Active engagement with feedback will lead to a self-directed approach where learners take responsibility for their own learning. In the literature a self-directed approach is emphasised in order to address the immediate accessibility of vast amounts of information on the internet. Blair et al. (2013) confirm that more needs to be done to fill the gap, thus allowing learners to take responsibility for their own learning through self-directed learning. Teachers need to take up the role as facilitators and guide learners to develop the skills to use feedback for their own learning (Yu-Mei, 2002). Engaging with feedback allows learners to learn from their mistakes and it also prevents them from making the same mistakes again. Turnitin allows learning to be more learner-centred, resulting in learners gaining more confidence because they are directing their own learning. Self-directed learning is successful when learners have a sense of responsibility and take ownership of their learning (Rolfe, 2011). Moreover, Turnitin provides an analysis of the types of error that occur, which Ferris (2004) maintains is being encouraged (see Figure 5.2 below).



GradeMark	Woordstrukture: Verkeerde vorm van die woord	Woordstrukture: Verkeerde woordkeuse	Woordstrukture: Spelling	Woordstrukture: Herhaling	Woordstrukture: Engels
gm	0	1	2	0	0
gm	2	3	3	0	1
gm	0	3	4	0	0
gm	0	1	1	0	0
gm	0	1	2	0	0
gm	1	2	3	0	1
gm	0	1	2	0	0
gm	3	3	2	0	1

Figure 5.2: Analysis of the errors of all the learners on one assignment

The analysis of the types of error made by every learner, as well as the progress made or lack thereof, is very useful for setting individual goals for learners. The teacher can follow the learner's progress via the internet and collect valuable information about her progress. Additional excercises can be emailed to the learner who needs the additional excercises. It directs the learners' learning and gives both

the teacher and the learner an indication of where help and support is needed. It is also very easy to convert the learners' marks into graphs. Examples of graphs that can be easily generated by Turnitin are given below to help the teacher assess individual learning. The errors that I have assessed here included the incorrect form of the word, use of the wrong word in the context of the sentence, incorrect spelling, the use of English words, incorrect word order, incorrect use of the past tense, lack of sense in what the learner wanted to convey, a missing word in the sentence, incorrect negative form and punctuation errors. I also gave them recognition for excellent writing. Figure 5.3 shows the errors identified in the first draft of the narrative essay, which involved process writing. In this process, learners write a draft essay, which I then mark and indicate the errors. No marks are allocated for the first draft, however. The learners then engage with the feedback and correct their errors. Only then do I mark the final essay and allocate marks.

Opstel Poging 1

s: Afrikaans11

oordstrul	Woordstrul	Woordstrul	Woordstrul	Sinstruktu	Sinstruktu	Sinstruktu	Sinstruktu	Sinstruktu	Punktuasie	Uitsonderli	Sinstrukture:
0	1	4	0	1	3	3	1	0	3	0	2
0	0	6	0	2	0	0	1	0	7	0	0
0	0	0	1	1	3	0	1	1	0	1	11
0	8	6	0	1	3	0	1	2	3	0	3
1	1	4	0	0	0	0	1	0	3	0	0
2	3	6	2	9	0	1	2	0	2	0	4
1	3	8	3	1	1	0	2	0	2	0	1
0	1	1	0	2	0	0	2	0	1	0	11
0	0	3	2	4	0	1	0	0	1	0	5
5	6	3	6	6	1	0	1	0	11	0	2
2	4	0	0	3	3	5	0	0	0	0	1
2	5	2	0	0	0	0	3	1	0	0	3
2	4	2	0	1	0	0	1	1	4	0	0
0	3	0	0	4	1	8	1	1	0	0	1
0	3	4	0	2	0	0	1	0	4	1	1
0	1	3	0	0	2	1	0	1	4	0	13
0	4	0	0	4	0	3	2	0	2	0	3
0	1	6	4	0	0	0	0	0	5	5	0
2	4	6	0	1	0	0	1	3	1	0	0
	--	--	--	--	--	--	--	--	--	--	--
17	**52**	**64**	**18**	**42**	**17**	**22**	**21**	**10**	**53**	**7**	**61**

Figure 5.3: Errors in the first draft of the narrative essays

In Figure 5.3, it may be seen that the number of errors is very high. It is also noticeable that excellent writing is quite low. In Figure 5.4, however, there is a noticeable improvement in the number of errors. It is to be expected because the learners were shown their errors and they were able to correct them using the grammar rules and peer and teacher support.

Finale poging verhalende opstel

ks: Afrikaans11

Woordstrukture:	Woordstrukture:	Woordstrukture:	Woordstrukture:	Sinstrukture:	Sinstrukture:	Sinstrukture:	Sinstrukture:	Sinstrukture	Punktuasie	Uitsonderli	Sinstrukture: N
0	2	1	0	0	2	0	2	2	1	0	4
0	0	2	2	2	2	0	4	2	1	0	5
1	1	7	2	2	1	0	0	0	7	0	0
1	0	2	0	4	0	6	1	2	0	0	2
0	2	1	0	0	0	0	0	0	3	8	0
1	4	1	0	3	2	0	2	1	1	0	2
0	4	2	0	1	0	1	0	0	0	6	1
0	1	0	0	2	0	0	0	0	2	4	0
1	2	1	0	0	0	1	2	0	4	0	0
1	3	2	0	0	0	0	0	0	2	0	1
2	2	0	1	7	0	2	1	0	3	0	3
0	1	2	0	1	7	0	1	1	4	1	0
0	1	1	1	2	1	0	0	0	0	11	0
0	1	2	1	0	7	0	0	0	5	1	0
0	0	1	0	0	0	0	0	0	0	17	0
0	0	2	0	1	0	0	0	0	0	0	0
1	1	2	0	1	0	0	1	0	1	14	0
0	0	0	0	0	0	0	0	0	5	0	0
0	1	0	0	0	0	0	2	0	1	0	0
--	--	--	--	--	--	--	--	--	--	--	--
8	**26**	**29**	**7**	**26**	**22**	**10**	**16**	**8**	**40**	**62**	**18**

Figure 5.4: Errors in the final draft of the narrative essays

In Figure 5.4 it can be seen that the number of errors decreased. In the following figure (Figure 5.5) the errors in the dialogue are shown. The number of errors had decreased in comparison with the first draft of the narrative essay which shows an improvement.

Dialoog

ks: Afrikaans11

Woordstrul	Woordstrul	Woordstrul	Woordstrul	Sinstruktu	Sinstruktu	Sinstruktu	Sinstruktu	Sinstruktu	Punktuasie	Uitsonderli	Sinstrukture:
0	0	1	0	2	0	3	1	2	1	0	5
0	1	4	0	2	0	0	0	0	3	6	0
1	1	4	2	3	0	0	1	0	4	2	0
1	2	8	1	0	7	0	2	0	1	4	4
1	1	1	2	6	1	4	2	0	1	2	2
2	3	6	3	3	0	0	1	0	10	3	1
0	0	7	1	1	0	0	1	1	0	4	0
1	2	6	2	4	2	0	1	0	15	0	1
0	1	10	0	0	0	0	0	0	1	4	0
0	0	1	0	2	3	10	2	1	4	0	0
1	1	1	2	3	0	8	0	2	4	0	2
0	0	1	1	2	0	4	1	1	2	1	0
0	0	2	2	1	0	1	0	0	4	2	0
0	2	1	2	0	0	0	2	0	0	3	0
0	1	3	1	3	0	1	0	0	3	4	2
0	0	3	0	3	0	0	0	1	2	3	0
2	0	3	0	1	0	0	0	1	4	4	0
0	4	0	0	2	0	1	0	0	3	0	0
0	0	2	0	2	0	0	1	0	4	6	0
0	0	0	0	0	0	0	0	0	0	0	0
9	**19**	**64**	**19**	**40**	**13**	**32**	**15**	**9**	**66**	**48**	**17**

Figure 5.5: Errors in the dialogue

The number of errors in the dialogue is high in comparison with the previous writing, namely, the final draft of the narrative essay. However, it is an improvement on the first draft of the narrative essay. The final draft of the essay would show fewer errors because substantive noticing had been applied where errors were highlighted and an indication was given of the type of error. Subsequently, the learners corrected the essay with the help of the grammar rules provided on Turnitin, capable peers and the teacher. The final writing, the email, shows vast improvements in comparison with the first draft of the essay.

E-pos

ts: Afrikaans11

Woordstrul	Woordstrul	Woordstrul	Woordstrul	Sinstruktur	Sinstruktur	Sinstruktur	Sinstruktur	Sinstruktur	Punktuasie	Uitsonderli	Sinstrukture: N
1	2	0	2	5	1	2	0	4	3	0	0
0	1	2	0	4	1	0	0	0	3	5	0
0	3	4	0	0	0	2	0	0	2	5	0
1	2	3	1	3	0	0	0	0	1	6	0
0	1	2	0	0	0	0	0	0	1	9	0
2	3	3	1	3	0	0	0	0	1	3	6
1	2	1	0	1	0	0	0	0	2	7	0
0	2	1	0	11	0	2	2	2	1	1	0
0	2	0	0	5	0	3	0	2	0	0	0
0	0	0	0	0	0	0	0	0	2	14	0
0	2	4	0	2	0	0	1	1	1	5	0
0	1	1	0	2	1	0	2	1	1	5	0
0	2	2	0	7	0	2	1	0	2	0	0
0	3	5	0	1	0	0	0	0	0	5	0
3	3	2	1	6	0	1	2	0	5	3	0
0	0	3	0	0	0	0	0	0	2	15	0
0	2	2	0	3	0	0	0	0	1	11	0
1	3	3	0	2	0	0	0	0	2	2	0
0	1	2	0	0	0	0	0	0	3	9	0
	--	--	--	--	--	--	--	--	--	--	
9	**35**	**40**	**5**	**55**	**3**	**12**	**8**	**10**	**33**	**105**	**6**

Figure 5.6: Errors in the e-mails

The e-mail was the last and final portfolio piece uploaded on Turnitin. The overall progress of the learners is evident in the decrease in errors and the increase in excellent writing as illustrated in Figure 5.6. The errors in this final portfolio piece in comparison with the first draft of the narrative essay shows that the use of Turnitin helped learners individually to identify their individual mistakes and to give them an opportunity to learn from their mistakes. By active engaging with the feedback, learners take responsibility for their own learning and direct their own learning by learning from their individual mistakes.

A	B	C	D	E	F	G	H	I	J	K	L	M
	Incorrect form of the word	Incorrect wor	Spelling	English word	Wordorder	Past tense	Confusing	Missing word	Negative form	Punctuation	Excellent	Incorrect use of Afrikaans
First draft essay	17	52	64	18	42	17	22	21	10	53	7	61
Second draft essay	8	26	29	7	26	22	10	16	8	40	62	18
Dialogue	9	19	64	19	40	13	32	15	9	66	48	17
E-mail	9	35	40	5	55	3	12	8	10	33	105	6
	8	17	24	13	-13	14	10	13	0	20	98	55

Figure 5.7: Errors in all the portfolio pieces

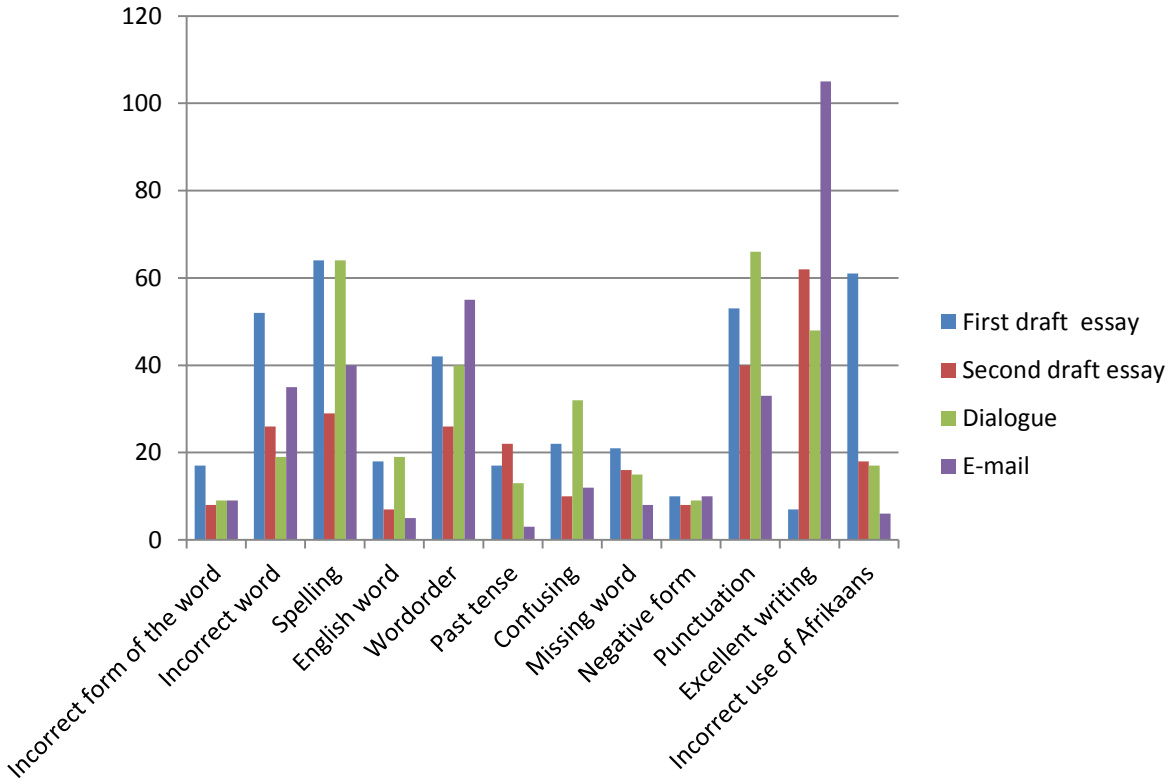


Figure 5.8: Errors in all the portfolio writing pieces

Figures 5.7 and 5.8 shows an overall improvement in the errors and an increase in excellent writing. These findings concur with the learners' responses in the data-collection instruments. Learners reported that their writing skills and language improved with Turnitin. However, a decrease in the wordorder column indicated that additional excercises for wordorder is needed.

I have utilised Turnitin as an effective formative assessment tool, though its primary purpose is to detect plagiarism. In a study reported by Buckley & Cowap (2013), the educators perceived Turnitin as very useful. The educators found the Turnitin software easy to use, marking was faster and they experienced a decrease in their workload. Turnitin is a very valuable tool for feedback through the Grade mark option. In addition, the quick mark comment is viewed by the educators as a great asset because it helps with the marking and it gives more weight and depth to the feedback. Saved quick mark comments can be quickly re-used or existing comments can be altered as well as the fact that the typing of comments went faster than the tradition writing of comments. Having assessments online, meant that no assignments can get lost and there was no need to transport it between home and the office (Buckley & Cowap, 2013).

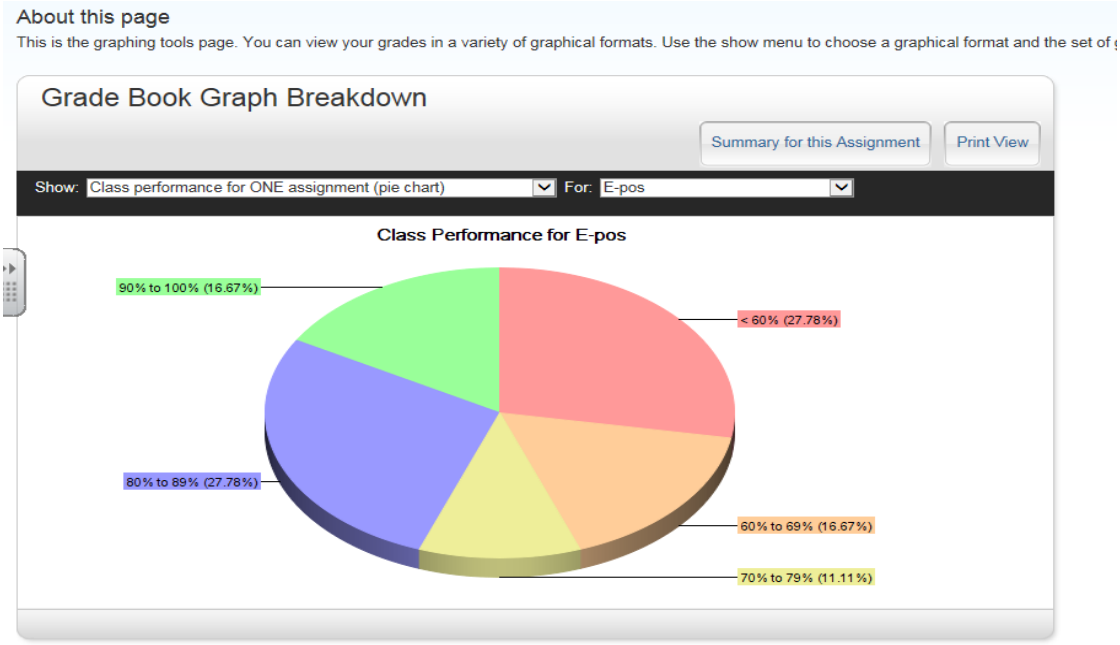


Figure 5.9: Overview of the entire class's performance on the e-mail

Turnitin provides educators with support to very easily identify the progress or the lack thereof of learners in relation to the class. The graphs that follow can be generated easily by the educator via Turnitin. Various types of graphs are available and the learners' marks are automatically uploaded onto Turnitin and as such saves the educator time. The errors that can slip in when transferring marks from the scripts onto an Excel mark sheet or a hard copy are eliminated. This feature of Turnitin was especially helpful in my position as an educator at a private school because the parents are very interested in how their children are doing in general and in relation to

the class average. They are also very interested in the progress of the learners and this feature gives a clear indication of a learners' progress or lack thereof.

Figure 5.9 presents the performance of the entire class in one assignment, the e-mail. This gave me a clear visual presentation of the performance of the entire class, which can be compare with the class aggregate to see whether learners performed poorly, average or above average.

Figure 5.10 gives the progress of one learner for all her assignments. This is very useful for identifying learners who require individual attention and to monitor the learner's progress. This graph shows that the learner improved in her creative writing. The second assignment shows zero because no marks were allocated for the first draft.

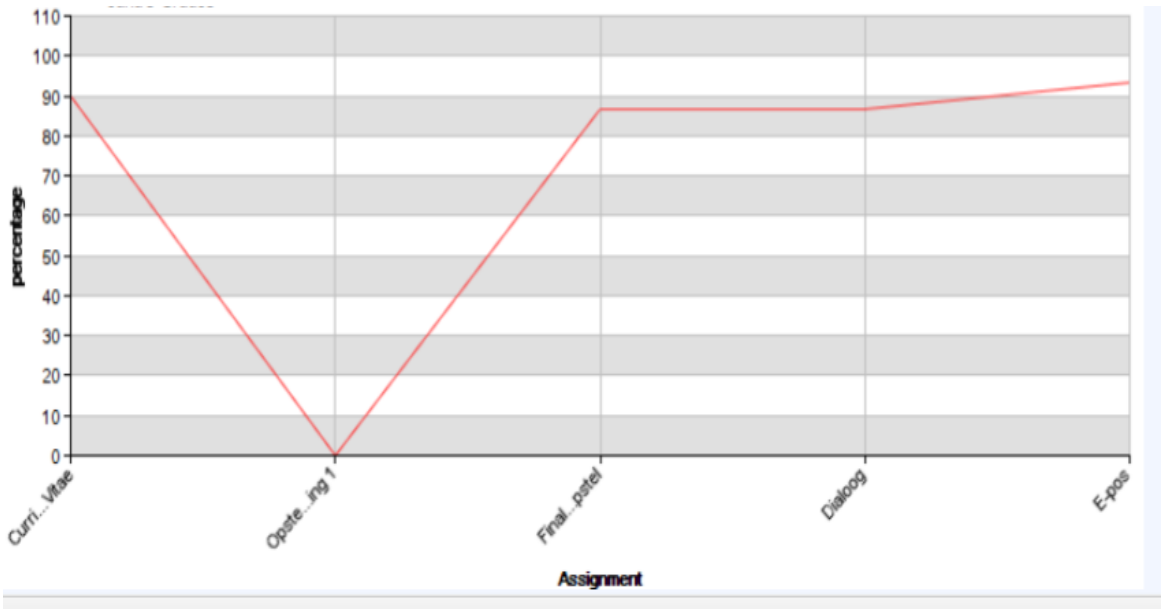
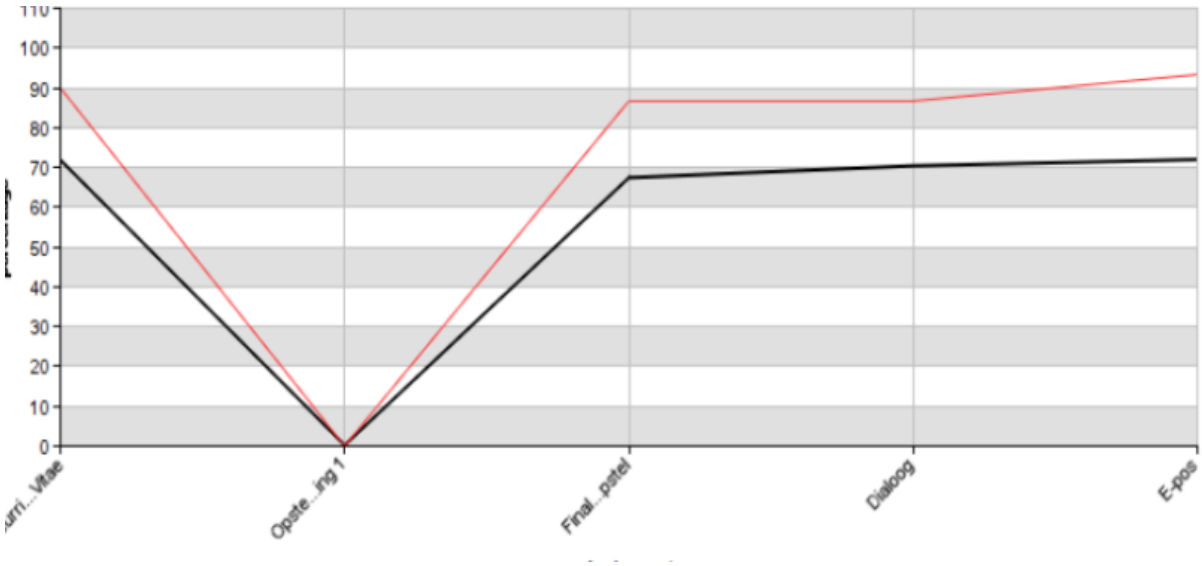


Figure 5.10: Performance of one learner

Figure 5.11 compares one learner's progress with that of the rest of the class. This graph is very useful for providing the learner and her parents with a clear picture of her progress in relation to the rest of the class. Bull et al. (2007) confirm that true knowledge is achieved by active engagement. Furthermore, Annetta (2010) maintains that technology integration enhances learner engagement, while Scardamalia and Bereiter (2003) are of the opinion that learners take ownership of their learning when they are actively engage with content.



Red: Learner's performance

Black: Class's performance

Figure 5.11: Performance of one learner compared to the class

Nicol and Macfarlane-Dick (2006) list the following advantages of good feedback:

- it helps learners with self-reflection
- learners receive high quality information about their learning progress
- feedback is motivating and it boosts learners' self-esteem
- it helps learners to reach their goals.

The learners found it easy to correct their mistakes electronically on their laptops because of the explanation of the error in the quick mark comment and the detailed explanation in the grammar rules. Hounsell (2003) adds that the process of learning is much faster and much more effective because learners know their strengths and where they need to improve.

5.3.5 Pedagogical Technological Knowlegde (PTK)

Mills (2010) mentions Vygotsky's convincing argument that powerful artefacts and learning opportunities to collaborate with experts must be provided in order to close the gap between learners' current levels of understanding and their potential levels. I used the discussion board as a platform for collaborative learning where learners shared their errors and correction with the rest of the class (Figure 5.12).

[Generally speaking, everyone knows what a narrative essay is. There were a few good introductions and conclusions. You must just all remember your paragraphs (which consists of a main idea). Unnecessary spelling mistakes like *'a'* instead of *''n'* must be avoided; it is unnecessary to make such mistakes. Read before you submit your work.]

[I've learnt a lot. Turnitin helped me to understand where the errors were on my CV. It is an interesting program that works effectively.]

Figure 5.12: Discussion board on Turnitin

By initiating a discussion opportunity on the discussion board, learners reported that they learnt from other learners' mistakes and they were not embarrassed to share their mistakes with and learn from other learners because everyone was involved in the activity. This coincides with Brown's (1977) statement that a person who is willing to make mistakes is more likely to experience success in second language learning. Accordingly, learners stated that they appreciated the individual feedback that is provided with Turnitin, as is reflected in the following statement:

> I successfully used technology in Afrikaans when we wrote our transactional essay on our computers and submitted it to Turnitin. It was good because we got personal feedback on our errors. (P15:15)

Collaborative learning was taking place in the discussion board. Learners felt that they were not the only ones making mistakes but that everybody was helping each other to correct their mistakes. In addition, when learners correct mistakes in their word and sentence structure and in punctuation they are also learning language. They are thus

forced to integrate grammar with creative writing, making the grammar rules so much more meaningful.

The main errors that were mentioned and discussed were word order or sentence structure. This is a common problem among First Additional speakers because the learners are unconsciously applying the transfer approach and in most cases negative transfer occurs between English as their Home Language and Afrikaans as their First Additional Language. It was interesting to note that one learner reflected on her own learning which I found very valuable for her progress. She reflected that she thought her vocabulary was insufficient to express her thoughts. The rules of word order are available on the quick mark comment, the learners engaged by discussing it on the discussion board and I briefly explained the word order in one sentence on the discussion board for everyone to see and take note of it.

Another error that was mentioned was punctuation. One learner reported that she learned that ‘n’ is always written with a small letter. These are some of the small gaps that can be filled with such a collaborate discussion. I am sure that there are other girls that learned from her comment. Learners use frequently English words because English is their medium of instruction and by making them aware of these words help them to focus on using the correct Afrikaans words. Words such as “hey”, “cool”, “hello” and “America”, just to name a few were mentioned.

Learners also mentioned spelling mistakes. I had to intervene and give the correct spelling of “foute” because some of the stronger learners were spelling the words incorrectly. The weaker learners learn from the stronger learners; therefore their word order and spelling must be correct in order for other learners to learn the correct spelling and word order. Other common spelling mistakes mentioned were: “kaans”, “kompiteer”, “defnetief”, “problem”, etc.

One learner mentioned that she made a mistake when she used the negative form. She forgot that “ooit” change to “nooit”. This is a typical example of the disintegration between the grammar component and the writing component.

One of the reflections on the discussion board besides the errors mentioned above was that the learner realised that she has to edit her own work first before submitting it to avoid unnecessary mistakes.

My experience on the discussion board showed that it is necessary that the teacher guides the discussion. I had to remind the learners to be specific when they mentioned their errors and not to make a general comment. The aim of the discussion board is for the learners to learn from each other. It is also important for the teacher to summarise the main points at the end of the discussion.

Learners mentioned that communication between teacher and learner and among the learners themselves had improved. Interaction on the discussion board emphasises Vygotsky's (1978) belief that interaction is the key to learning. Furthermore, in a context that allows interaction and communication learning is viewed as a social process. In this case study, the classroom and the online environment comprised the social context for learning, allowing learners to work cooperatively. Shin (2013) reports that internet-related technologies have the potential to change learners' social relationships. He also mentions that internet-related technologies will enable learners to facilitate new ways of sharing and creating knowledge.

In the next section I will discuss the integration of the different components of Afrikaans FAL with Turnitin.

5.3.6 Integration of content, pedagogy and technology

A major obstacle in second language acquisition is the fact that learners often fail to see the connection between the oral presentations, writing and grammar structures. They view these as being separate sections of language learning while in fact they are integrated. Learners do not grasp the concept that what you learn about grammar structures must be applied when you do oral presentations, write a creative piece or communicate in the target language and thus do not integrate the different sections. By using the quick mark comments on Turnitin, learners are forced to integrate writing and grammar structures when they correct their word and sentence structure errors and errors in punctuation. This is one of the great advantages of Turnitin and can contribute to the success of language teaching in the FAL classroom. Another great advantage is that the teacher can provide feedback on Turnitin in any language, because the teacher creates personalised feedback.

5.4 Advantages

Turnitin proved to be of value to the learners as they want to know where they need to improve and they prefer to engage with WCF and to correct their errors to no engagement with feedback at all. The learners want to interact with other learners and learn from them. The following advantages were identified in terms of the use of Turnitin to address learners' individual needs:

- Learners receive high quality feedback about their learning progress; graphs can be created instantly with Turnitin.
- Discussion board in Turnitin provides a platform for collaborative learning.
- Writing skills and language skills improved with Turnitin.
- Teachers can provide feedback on Turnitin in any language.
- Turnitin gives learners an indication of the areas where help and support is needed.
- Learners can monitor their progress on Turnitin.
- Individualised personal written corrective feedback (WCF) is possible with Turnitin.

The next section will discuss the final theme that emerged from the data, namely, "*Employment of specific technologies to address the individual needs of learners"*. This theme consists of the following three categories, namely, individual learning, feedback and different styles of learning.

5.5 Theme that emerged from the technological pedagogical content knowledge

5.5.1 Theme 5: Employment of specific technologies to address the individual needs of learners

Blair et al. (2013) confirm that more needs to be done to help learners to take responsibility for their own learning through self-directed learning. Cramer (2007) emphasises the inclusion of learning skills such as self-directional skills, problem-solving skills and interpersonal skills in the curriculum. In addition, the use of 21st century skills in the context of globalisation and 21st century assessments are key elements for learning. Nelson (2008) is of the opinion that pedagogically skilled teachers will be able to guide learners to construct their own knowledge. Content becomes more meaningful when learners engage actively with such content. In

addition, learners will be more committed to do their best if they co-design the curriculum or if the teacher uses a flexible approach that allows learners greater freedom to choose both the topics and the mode of delivery. In addition, active engagement with content leads to autonomy of learning. When learners take ownership of their learning, they tend to be more motivated and they will direct their own learning with the setting and evaluation of individual goals.

Ghaith (2010) is of the opinion that the education system needs to be transformed if it is to accommodate the new digital generation. Yu-Mei (2002) reports that teachers need to reflect on their role and adapt to the needs of the learners. Technology affects the class organisation, the social learning climate and teacher-learner interaction. It is suggested that the classroom must be arranged in such a way that both group work as well as individual interaction between learners, and learner and teacher, may be easily accommodated. Learning is more learner-centred and self-directed, with learners taking responsibility for their own learning in the 21st century FAL classroom. In addition, learning is characterised by an active, collaborative and individual focus. Learners set goals for themselves and they monitor these goals with the teachers as decentralised facilitators.

As illustrated in Figure 5.13 the following three categories relate to this theme, namely, individual learning, feedback and different styles of learning.

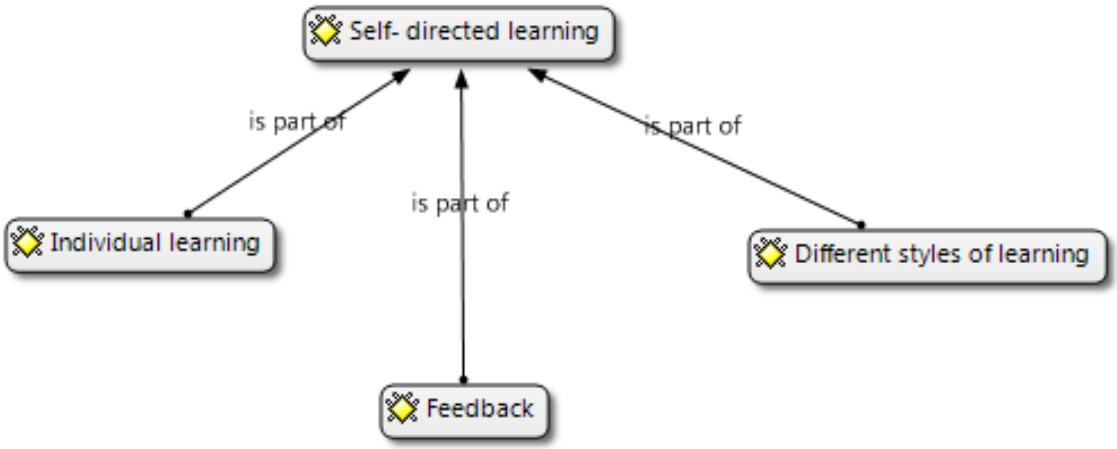


Figure 5.13: Categories relating to the theme: self-directed learning

5.5.1.1 *Innovative and effective ways for individual learning*

As illustrated in Figure 5.14 the following six sub categories emerged from the category of individual learning, namely, evaluate information critically and competently, extension of knowledge, independent learning, individual feedback, individual learning and taking responsibility for their own learning.

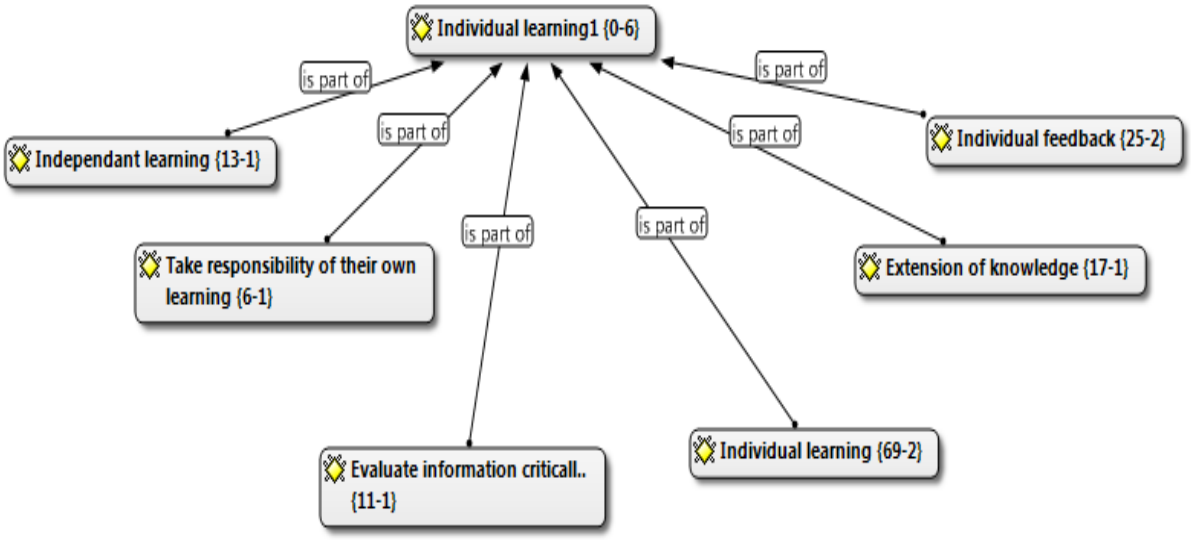


Figure 5.14: Sub categories relating to the category: Individual learning

Table 5.1 presents an overview of the typical evidence provided for the category of individual learning.

Table 5.1: Codes and typical quotations for the category of individual learning

Code	Quotations
Evaluate information critically and competently	Evaluate information critically and competently (P18:4)
Extension of knowledge	Also to extend my knowledge of work covered in class with broader sources that I have researched (P1:11) Technology clarifies issues and shows it on a larger scale, thus allowing for better understanding (P10:19) Benefits: links us to the world out there, the reality of the day and expanding general knowledge, using it as a starting point.(P21:39)
Independent learning	Technology also has its advantages as independent learning (P1:9) Teaching style changes, I become the facilitator and learners becomes more independent (P21:69)
Individual feedback	Easier submission of work, individualised feedback and fun lessons (P3:14) It was very helpful to be able to receive feedback that was individual and to be able to learn from our mistakes and not just get a mark back (P20:137)

➡

Individual learning	I do think our teacher addresses our individual needs because we have quite a few websites where we hand in tasks or do assignments and these automatically get marked for us and come back with the teachers' individual comments on our tasks and tips and advice on how we can improve in that section of work. We can also receive help from our teacher via email in which she can help by forwarding an activity to practise from or scheduling a extra Afrikaans class after school to help you with the things you are struggling with (P3:40) Emails and individual feedback regarding your marks for the task at hand and providing advice or showing in what way we can correct our mistakes and errors and, thus, helping us to improve and use this for future use (P11:35)
Take responsibility for their own learning	When technology integration in the classroom is seamless and thoughtful, students not only become more engaged, they begin to take more control over their own learning, too (P9:37) Learners help create the curriculum by choosing their own topic and this enables them to take responsibility for their own learning (P21:93)

Integrated discussions and interpretations

Cramer (2007) stresses the importance of individualised teaching while Garrett (1991) suggests that sophisticated technology may be utilised for individualised learning by giving learners the freedom to choose their own approaches or presentation of their work. It is, thus, essential that technology be used to make the best use of the learners' time. I use a flexible approach to the curriculum and I give learners the freedom to choose their own topics and to decide on their mode of delivery as long as I realise the curriculum outcomes.

The participants regarded the skill of being able to evaluate information critically as extremely important for self-directed learning. This finding is in agreement with Kereluik et al. (2013) who are of the opinion that problem-solving and critical thinking skills are now needed more than ever before because of the vast amount of information which is available. Learners need to be able to discern what is valuable and of quality. The participants also felt that the resources available on the internet for the extension of knowledge were beneficial to them. Technology encourages independent learning because all the knowledge and information which is available on the internet. The participants appreciated the individual feedback that they were receiving and felt it helped them to learn from their mistakes. In addition, it also gave them direction and led to deep learning because they were actively engaged with the content. They were able to focus on their individual improvements. Supplemental grammar instruction may be emailed or provided via a link to learners, depending on their individual needs (Ferris, 2004). Turnitin has the unique feature that the teacher is able to keep and provide each learner with a maintenance error chart. The majority of

the participants felt that their individual needs were being met with the use of technology. They were of the opinion that that the integration of technology in lessons led to learners taking responsibility for their own learning.

The learners acknowledged that they spend considerable time on social media outside school hours. Social media is ideal for the collaboration, learning, interaction and co-creation that may result in improved teaching and learning (Wankel, 2011a). Social media has the potential for individualised teaching in languages and for more personalised learning and teaching experiences. Learners are able to communicate in a language other than their mother tongue (Ng'ambi, 2008). Support can be provided either formally or informally by the teacher or more capable peers (Vygotsky, 1978). In addition, social media platforms encourage the collaborative learning which addresses individual learning needs. Learners contribute individually, and, collectively, they create new knowledge with learners learning by interacting socially with each other (Vygotsky, 1978).

5.5.1.2 *The importance of feedback*

As illustrated in Figure 5.15, the following six sub categories emerged from the category of feedback, namely, assessment, easy to correct mistakes, easy to identify mistakes, feedback is more effective, individual feedback, and learn from your own mistakes.

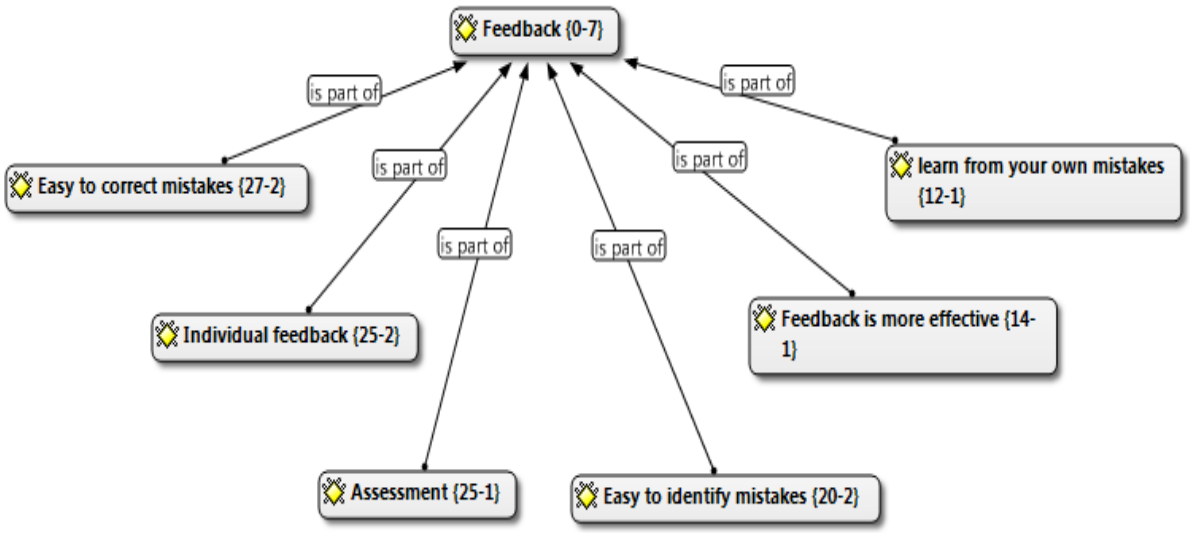


Figure 5.15 Sub categories relating to the category: feedback

Table 5.2 presents an overview of the typical evidence provided for the category of feedback.

Table 5.2: Codes and typical quotations for the category of feedback

Code	Quotations
Assessment	The intranet test was also very convenient and we received our marks back in a short space of time (P8:7) I was more stressed about if my laptop, intranet and internet would work rather than being stressed on whether or not I knew the work that I needed to study (P20:82)
Easy to correct mistakes	I enjoy using technology as it is easier to correct mistakes and it also prevents us from wasting paper in the interests of becoming eco-friendly (P7:3) Being able to see exactly where mistakes have been made and correct them (P20:76)
Easy to identify mistakes	It helps me see my mistakes easily (P1:31) It helps to see your mistakes and to understand better (P20:56)
Feedback is more effective	Technology makes the submission and feedback of work easier and more effective (P3:13) The use of technology was successful in the classroom when we got detailed feedback on the assignments we handed in. I benefited from this because I saw my mistakes and where I need to improve. (P8:19)
Individual feedback	I love that I can get individual feedback for essays because that is what I need, it improves my bad habits that I have had for many years without being corrected (P20:16) Personal feedback on errors (P15:16)
Learn from your own mistakes	My individual needs are met when the teacher uses Turnitin because it really helps me to see where I am going wrong (P20:64) It was very helpful to be able to receive feedback that was individual and to be able to learn from our mistakes and not just get a mark back (P20:137)

Integrated discussions and interpretations

As compared to Krashen (1982) and Truscott (1996) who argue that written CF has no place or value in second language acquisition, the participants clearly appreciated the fact that they technology enabled them to identify and correct their mistakes easily (Hattie & Timperley, 2007). The participants found the feedback extremely useful because they could identify and correct their errors (Rolfe, 2011). In particular, the learners appreciated the individual feedback because they could learn from their mistakes (Ferris, 2010). These findings concur with Chen (2013) assertions on the pedagogical value of electronic assessment. Chen (2013) elaborates on this, saying that electronic assessment may help learners to reflect on their work and this, in turn, may lead to the autonomy of learners where they take responsibility for their own learning (Hyland & Hyland, 2006b). While the participants appreciated the electronic assessments of the creative writing on Turnitin, the majority of the participants did not

really like intranet tests because they reported that they were anxious about the technology not working properly and internet connectivity (Shabitha & Mekala, 2013).

The learners had to produce creative writing, which concurs with Ellis's (2005) input-output acquisition theory, and upload it on Turnitin. I marked the creative writing and gave the learners individual, written feedback. They then acted upon this WCF by correcting their errors with the help of the information in the quick mark comment. If they still struggled, they could participate in the interactions on the discussion board and obtain the support of other more capable learners or the help of the teachers. This interaction in the target language on the discussion board coincides with Ellis's (2005) belief that interaction in order to convey meaning is the key to acquiring a language. The discussion board provides learners with the opportunity for engagement in the target language. Johnson (1995) explains that, for learners, achievement comes from allowing them to choose their own topics. The learners in my class enjoy that freedom as I allow them to choose their own topics and content for creative writing and prepared speeches. Van Lier (1996) agrees that learners should be given more autonomy in their interactions in language teaching than is currently the practice. Ferris (2014) states that comprehensive error correction may be both overwhelming and discouraging, thus teachers should rather provide selective error feedback or feedback on specific error patterns. In addition, indirect feedback is more beneficial to the learners than direct feedback as explained in Chapter 2.

5.5.1.3 *Different styles of learning*

Dede (2005) believes that the technological changes in the environment of the learners are influencing their learning styles. He reported emerging learning styles such as fluency in multiple media, collective reflection, guided mentoring, co-designing of learning experience and the focus on individual needs. Dede (2005) encourages teachers to adapt their teaching style to the new learning styles of the digital generation.

As illustrated in Figure 5.16, the following four sub categories emerged from the category of different styles of learning, namely, audio is helpful, learn by doing it yourself, visual learning is helpful and work from the known to the unknown.

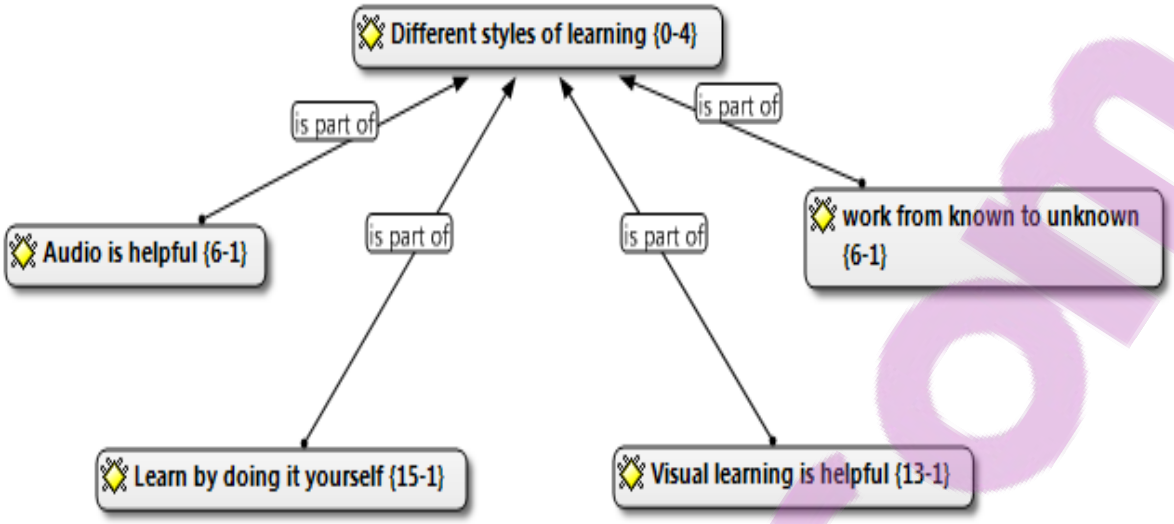


Figure 5.16 Sub categories relating to the category: different styles of learning

Table 5.3 presents an overview of the typical evidence provided for the category of different styles of learning.

Table 5.3: Codes and typical quotations for the category of different styles of learning

Code	Quotations
Audio is helpful	Interactive lessons with audio and clips make lessons more entertaining and exciting, inspiring the students to participate and the teacher to continue motivating the learners (P7:24) I enjoyed the listening skills that also developed because of the audio individual feedback via earphones (P21:22)
Learn by doing it yourself	Also by experimenting and trying to figure things out by myself(P5:12) I learnt them through practice (P13:4)
Visual learning is helpful	The learners like the visual lessons (P21:3) Learners developed visual skills because internet has a lot of visual information and with the smart board everything can be uploaded easily (P21:83)
Work from known to unknown	It was very helpful to see how much you understand on your own and to see how you can actually understand more than you think you can (P20:19)

Integrated discussions and interpretations

The participants reported that the incorporation of audio and visual images in lessons made the lessons interesting and fun. This finding concurs with Nowaczyk (1998) who believes that the integration of technology in lessons is particularly beneficial for low-achieving students because of the illustration of concepts and the organising of factual information. Another advantage the learners reported was that they felt that their listening skills were also being developed with audio teaching aids. Some of the participants explained that they acquired their technical skills by experimenting and

engaging with the technology. In addition, the participants found it helpful to work from the known to the unknown.

5.6 Conclusion

In this chapter I reported on the results of the e-portfolios, specifically Turnitin. The results were interpreted and the findings in terms of the existing literature as discussed in Chapter 2 were provided. Furthermore, I discussed the results pertaining theme 5, *employment of specific technologies to address the individual needs of learners*, which emerged out of the technological, pedagogical and content knowledge (TPACK) of the inquiry and I enriched the discussions with quotations from the participants.

CHAPTER 6

OVERVIEW, SYNTHESIS OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

Teachers prepare learners to be fully functional members in society and be of value to their country. The digital industry needs trained, computer literate personnel. It is, thus, essential that teachers are aware of the increased demands on learners as a result of the ongoing advancement in computer technology and the impact thereof on both teaching and learning. Teachers must create classrooms that foster the ability of learners to learn. It is anticipated that this study will contribute to the existing literature on technology integration in a language classroom and on how computer technology may be utilised as a tool for individualised language teaching and learning. Thus, this inquiry addresses the gap reported by Zhang (2010), Golonka et al. (2014) and Holland and Holland (2014) which indicates that significant need exists for further studies on the effect of specific technologies on learners with varying proficiency levels in a diverse class of learners. Chapter 5 contained an in-depth analysis of the data collected from the e-portfolios of the learners. Turnitin and its innovatively application to accommodate the individual needs of the learners were provided. The different portfolio pieces, the focus of the errors as well as the progress in the errors were discussed. The last theme, *employment of specific technologies to address the individual needs of learners*, which emerged out of the TPACK of this inquiry was discussed.

This chapter provides a synoptic overview of the inquiry as well the contributions and limitations of the study. These findings are then discussed with reference to the three research sub-questions. This is followed by recommendations for future research before the thesis is concluded.

6.2 Summary overview of the inquiry

Chapter one contained an orientation of the study and indicated the importance both of technology in the 21st century classroom and of teaching learners who are surrounded with technology. The chapter provided background information to the study and discussed the rationale behind the inquiry. In addition, the chapter

discussed the linguistic context of this inquiry, as well as the information and computer technology context in South Africa. The conceptual framework that guided the study as well as the research question and sub-questions were then explained. A short overview of the relevant literature followed. The chapter concluded with an explanation of some of the limitations of the study and a discussion of the ethical considerations that were taken into account in the course of the study.

Chapter two contained an in-depth analysis of both the theoretical frameworks used in the inquiry and previous studies conducted in this field of inquiry. The TPACK framework and reasons why this framework was used in combination with Vygotsky's theory to form a new conceptual framework for the purposes of the study were explained. The chapter then discussed the various relationships in the TPACK framework as a result of the interaction between content knowledge (CK), technological knowledge (TK), and pedagogical knowledge (PK). The chapter then moved on to explain the four domains arising from the intersection between content knowledge, technological knowledge and pedagogical knowledge, namely, *technological content knowledge* (*TCK*), *pedagogical content knowledge* (*PCK*), *technological pedagogical knowledge* (*TPK) and technological pedagogical content knowledge* (*TPACK*) (Mishra & Koehler, 2006a). The chapter then shed some light on the various second language learning theories and approaches as well as the role of written corrective feedback and assessment, in particular, e-assessment in the language learning process. A section in the chapter concentrated on the Turnitin software which was used in this inquiry. The advantages and disadvantages of technology integration were highlighted as well as the changes that occur in the curriculum or subject matter as a result of the technological changes in our environment. Finally, the teacher and the learner in the 21st century as well as skills required in the 21st century were discussed.

Chapter three focused on the research design and research methodology used in the study. This inquiry was both an exploratory investigation and a netnographic case study. I discussed my reasons for my choice of netnography and a qualitative approach. The chapter then provided information on the participants and discussed the type of sampling, the data collection instruments and the data analysis procedures used in the study. In addition, I described my role as a researcher. The advantages of netnography were discussed as well as the steps taken to ensure the trustworthiness

of the study. ATLAS.Ti 7 was used to analyse the data according to categories and themes.

Chapter four reported on the analysis of the data which emerged from the primary documents. The aim of the analysis was to explore the perceptions of the integration of technology in the FAL class of both the teachers and the learners. All the data which had been obtained from the 19 semi-structured interviews conducted with the learners via e-mail, the blog entries in which the learners reflected on their experiences in class, the focus group discussions with the four FAL teachers and the technician as well as class observations via video-recording supported by field notes were analysed. I focused on the separate interpretations of the views of the teachers and the learners on the integration of technology in a FAL class which arose from the data collected and linked these to the literature discussed in the literature review in Chapter 2. The chapter highlighted the potential contributions of the study to the existing knowledge base on the integration of technology in First Additional Language learning. Furthermore, the chapter contained a thematic analysis. The four themes that had emerged from the data included *a century characterised by fast-moving technological innovations, the integration of technology into teaching and learning in the digital era, speed and ease of technology and transformation of teaching and learning*. The chapter discussed the implications of the research findings and how they related to the theory which had been discussed in Chapter 2. In addition, the implications of the research findings were also linked to the teaching and learning practice in contemporary digital classrooms. Lastly, the data were examined through the lens of the adapted conceptual framework.

Chapter five addressed the first and the third sub-question. Data reporting and analysis within this chapter included reporting on the e-portfolios of the learners in Turnitin. The analysis of the types of error made by every learner, as well as the progress made or lack thereof, was presented. The focus of the errors that was reported on included the incorrect form of the word, use of the wrong word in the context of the sentence, incorrect spelling, the use of English words, incorrect word order, incorrect use of the past tense, lack of sense in what the learner wanted to convey, a missing word in the sentence, incorrect negative form and punctuation errors. The report on the learners' errors in the first draft of the narrative essay, the final draft of the narrative essay, a dialogue and the email was provided. In addition,

the analysis of the data in this chapter gave birth to theme five, namely, self-directed learning.

6.3 Addressing the research questions

6.3.1 The primary research question

- How does computer technology (ICT) influence FAL teaching and learning in a multilinguistic class?

Addressing this primary research question entailed firstly ascertaining the way in which in a FAL is mastered. Secondly, the teaching process is extremely complex and the teaching environment is changing constantly as a result of the rapid development of technology outside of the classroom. A netnographic approach was deemed to be the most appropriate approach to follow in this inquiry as it would harness the advantages of the internet while saving time and money with the use of innovative data-gathering techniques. In accordance with the findings of Mishra and Koehler (2006), I concluded that the basis of sound second language teaching with technology is the application of sound good pedagogical techniques in second language learning and using the most appropriate technology to teach content that is authentic and meaningful to the learners. Effective teaching and learning occur at the point of equilibrium at which pedagogy, content and technology meet. In addition, the integration of Turnitin software in second language classrooms provides a platform for individual learning.

The use of Turnitin has given rise to a different method of communication and has resulted in spontaneous collaboration between all participants interacting in the target language on the discussion board of Turnitin. As advocated by Krashen (1986) this interaction in the target language leads to language acquisition while the new knowledge is created within a social constructivist environment (Vygotsky, 1978). The written corrective feedback (WCF) starts an iterative cycle of review and contribution. Although the learners reported that they preferred corrective feedback this contradicts Krashen's statement that corrective feedback is more damaging than beneficial for language learning.

By actively engaging in their individual WCF, learners reflect on their individual mistakes and learn from these mistakes. Thus, learners take ownership of their own

learning which results in self-directed learning (Figure 6.1). Self-directed learning leads to the high self-esteem which encourages language learning (Krashen, 1982). Technology enforces active participation on the part of the learners and this leads to a deeper understanding of the content. Learners are able to monitor their individual progress with the help of the teacher and using Turnitin's Grade Mark features. In addition, individual learners are provided with support from their more capable peers and the teacher on the discussion board. The grammar-translation approach and Ellis's (2005) input-output learning theory come into play when the quick mark comment on Turnitin provides the grammar rules instantly to the learners, thus making the learning of the second language more meaningful. This results in deep learning. Learners integrate the language aspect of second language learning in their creative writing and also apply it in their interactions on the Turnitin discussion board, thus making it more meaningful to them.

I concluded that the integration of technology has a positive effect on learning in a multilingual FAL classroom because it increases the learners' interest, motivates them to take ownership of their own learning and has the potential to address the individual needs of the learners. The contribution of this study to the existing literature on second language learning involves the use of Turnitin, an existing plagiarism technology tool, and innovatively applying it to teach a second language by integrating the grammar rules which are a core component of second language learning with the authentic, creative writing of the learners, addressing the individual needs of learners through WCF and, thus, making second language learning so much more meaningful (see Figure 6.1).

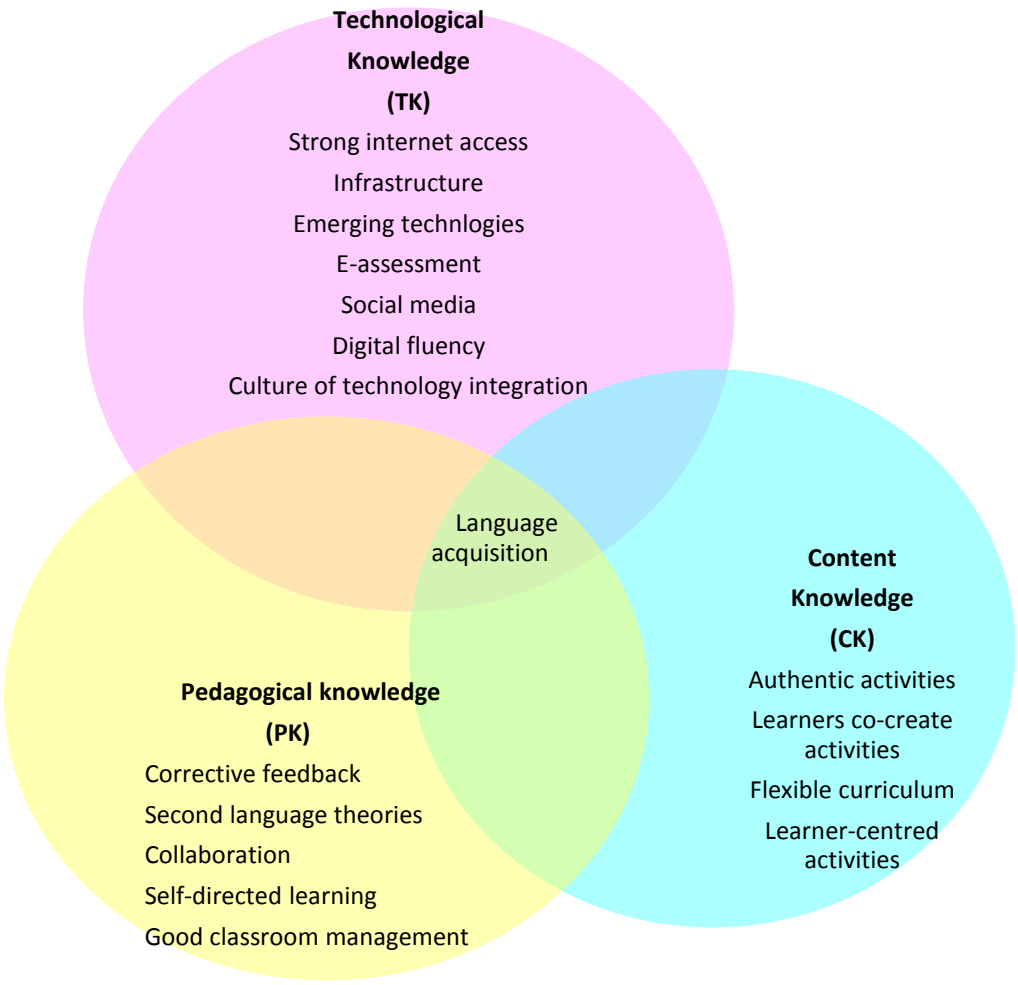


Figure 6.1: Positive influence of technology on second language acquisition

6.3.2 The research sub-questions

The primary research question was broken down into three subquestions:

- How and in what ways can computer technology be made relevant for 21st century teaching and learning in a multilinguistic language class?
- How are FAL teaching and learning challenged when integrating computer technology in a multilinguistic class?
- How can computer technology be utilised to address every learner's individual learning need?

Subquestion 1

- How and in what ways can computer technology be made relevant for 21st century teaching and learning in a multilinguistic language class?

Learners are growing up in a digital world. Learners reported that they are socially networked and connected, actively contributing to their own learning by creating new knowledge on social media. Technology is evolving at a rapid pace and to stay functional, one needs to acquire the skills needed to meet the demands set by the evolving digital ecology. The participants believed that technology integration in schools is the direction for the future as advocated by Lessig (2008) and it is advantageous to be at a school that was technologically advanced. The increased access to information via the internet and the rapid evolution of technology has changed the traditional ways of teaching. The focus of teaching and learning is on the skills that we have to teach the learners to place them in an advantageous position to cope with the demands of the digital environment. Therefore, learners and teachers acknowledged the for need 21st century skills to survive in the digital world. They reported that learners acquire and used it without realising it. Most of the participants agreed that the school and teachers have to adapt to the environment and become lifelong learners. This comment coincides with Lessig's (2008) line of thinking. Teachers are in the best position to adapt technology that is designed for the corporate world because the learners preferred the lessons with new technology as they were exciting and different and they also motivated the learners to do their best as suggested by Dede (2005). Learners reported the speed and ease that technology brings. In this fast-paced world people are looking for solutions that save time. The fastest approach is often seen as the best approach. Learners reported that they understand the work much better, recall of information is better, research is easier, essay writing is better and faster and they appreciate the individual feedback with Turnitin software.

Subquestion 2

- How are FAL teaching and learning challenged when integrating computer technology in a multilinguistic class?

It is evident from the observations of the video recordings that classroom atmosphere and classroom discipline are vital for both second language learning and for successful technology integration in a class. Another challenge crystallised is the provision of sufficient internet access. The learners and the teachers expressed their frustration with the lack of internet access especially when learners were busy with tests or assignments that count towards their term mark. The internet did not always

work properly and this caused considerable anxiety, sometimes resulting in the learners not performing well in their intranet tests. This statement reflects the findings of Golonka et al. (2014b) who reported the frustration experienced by learners when technology does not work properly. Learners also mentioned that losing work because of a battery that died or a laptop that crashed, is another challenge. The learners reported their frustration when technology failed to work properly and they had to take it in for repairs. In addition, the condition of the laptops was reported as extremely important. The schools needs to ensure that they make adequate provision for technological expenses because technology is evolving at a rapid pace, and in order to stay competitive, schools needs to stay updated with the newest technologies.

In conclusion, according to the learners distraction is a huge challenge with the integration of technology. Good classroom management is therefore needed to ensure that learners stay focused on the task at hand, because learners get easily distracted by other websites.

Subquestion 3

- How can computer technology be utilised to address every learner's individual learning need?

The participants regarded the skill to read and evaluate information critically as vital because of the availability of the large amount of information. Therefore, teachers are forced to take a facilitator's role by guiding the learners to take responsibility for their learning. This finding is in agreement with Kereluik, Mishra, Fahnoe & Terry (2013) who regard problem-solving and critical thinking skills as very important 21st century skills because of the vast amount of information which is available. The participants also reported that they use the internet resources for their individual extension of knowledge. The learners also felt that they were being catered for individually because Turnitin is very learner-centred. Learners described the Turnitin experience as a personalised learning experience focused on their individual needs. Furthermore, learners reported that Turnitin was one of the most successful integrations of technology in the FAL classroom and mentioned that it had helped them to improve their Afrikaans FAL skills. In addition, learners are of the opinion that their writing skills and language improved with Turnitin, which confirms the statement made by Rolfe (2011) that Turnitin is very valuable for the development of literacy. The learners reported that it was easy to identify their mistakes using the colour-codes in the

feedback provided by the Turnitin software program. The participants reported that they appreciated the incorporation of audio and visual images in lessons; it made the lessons interesting and fun. Different learning styles can be accommodated with technology. This finding concurs with Nowaczyk (1998) who believes that low-achieving students benefit from the illustration of concepts and the organising of factual information.

In contrast with Krashen (1982) and Truscott (1996) who argue that written CF has no place or value in second language acquisition, the participants clearly appreciated the individual feedback. Technology enabled them to identify and correct their mistakes easily as advocated by Hattie & Timperley (2007).

6.4 Significance of the study

As mentioned in Chapter 1, this inquiry was underpinned by two socio-linguistic realities. Firstly, Golonka et al. (2014b) highlight the importance of the technological sphere and the need for teachers to engage with technology while, secondly, Chapelle (2009) mentions the value of technology integration in language learning. Technology opens up authentic opportunities for exposure to the target language and also for interaction in the target language. In addition, it also provides learners with authentic opportunities to write in the target language (Chapelle, 2009). Technology also supplies learners with multiple forms of rich input and interaction.

6.4.1 The integration of Turnitin in a Afrikaans FAL classroom

Cramer (2007) and Nelson (2008) emphasise that more needs to be done to help learners to take responsibility for their learning. In addition, Zhang (2010), Golonka et al. (2014) and Holland and Holland (2014) indicate the need for further studies on the effect of specific technologies on learners with different proficiency levels in a diverse learning class.

In this study Turnitin, an existing plagiarism tool, was innovatively used to address the individual needs of learners with Turnitin being used to address the different levels of Afrikaans FAL proficiency in the class. The e-assessment tool of Turnitin was used to provide individual feedback in order to address the individual needs of the learners in the multilinguistic language class. I gave WCF individually to each learner by using the colour identification feature of Turnitin to highlight their errors. A quick mark comment

(see Addendum A) containing all the grammar rules that comprise a core element of Afrikaans FAL learning appears if learners move their cursor over the highlighted error. Thus, learners identify the error, use the quick mark comment to correct the error and engage with the WCF. Learners are forced to integrate the grammar rules with their creative writing and this makes their learning more meaningful.

The second language approaches in this context included the grammar-translation method and the learner-centred approach. The discussion board of Turnitin provided a platform for help from capable peers and the teacher (Vygotsky, 1978). Learners were able to ask for help individually while any capable learner or the teacher could help a learner online. The learners acquired the language in a natural setting and all the learners were eager to participate because everyone formed part of the discussion board. In addition, the learners were not afraid to make mistakes because each learner was involved and the focus of the discussion board was on solutions for errors made (Krashen, 1982). The learners appreciated the WCF on Turnitin because it helped them identify areas in which they needed to improve while it also highlighted their strengths.

I adopted a constructivist approach in terms of which the learners constructed their own knowledge from their own errors. I guided the learners to identify their errors and they then corrected these with the help of the quick mark comment and also the assistance of capable peers and the teacher on the discussion board. This helped them to learn from their mistakes and to take responsibility for their own learning. In other words, collaborative learning was taking place in the discussion board. The learners felt that they were not the only ones making mistakes but that everybody in the class was helping learners to correct their mistakes. Language is also being taught when the learners are correcting their word and sentence structure mistakes and their mistakes in punctuation. This forces the learners to integrate grammar with creative writing, thus making the grammar rules far more meaningful. Individual needs are addressed with the WCF.

Collaborative platforms such as the discussion board on Turnitin are extremely useful in terms of language learning. Garrett (1991) considers interaction in the target language in a real context to be of extreme importance and this is regarded as the most effective way in which to learn a target language. Learners are forced to think, speak and write in the target language and they cannot hide away. The target

language is acquired spontaneously (Rueckert et al., 2013). The learners were also active in the chatroom discussions and, therefore, they were actively engaged in the construction of knowledge and in conversation about the topic in question. This experience was extremely meaningful to the learners because it was authentic while it also provided a platform for communication in the target language (Krashen, 1982).

6.4.2 Interaction and collaboration in online environments

Krashen (1982) views the acquisition of a language in a relaxed, natural environment in which the learners want to listen or contribute as the easiest way of learning a language. Technology may provide such platforms for language learning with learners being exposed both to the target language and to opportunities for interaction in the target language. In addition, learners can also be provided with opportunities to write in the target language (Chapelle, 2009). Technology supplies learners with multiple forms of rich input and interaction.

Krashen (1982) is of the opinion that highly-motivated, self-confident learners with low anxiety tend to succeed in second language acquisition. Vygotsky (1978) views learning as a social process in a context while the social interaction in the context is key to learning. Learners learn through interaction and collaboration with other learners and, thus, knowledge is a human product. Both the classroom and the online environment in this case study were the social context for learning and enabled the learners to work co-operatively. The interactions, activities and relationships in the classroom and digital environment are situated within the social constructivist paradigm. Learners learn from one another in a social context and, with the help of the teacher and capable peers, they acquire knowledge and skills through interaction. Thus, their learning is facilitated by social interaction and the learners take responsibility for their own learning by engaging in co-operative and authentic learning tasks and activities.

6.4.3 Netnography in Afrikaans FAL inquiry

The possibilities of data gathering methods are endless via the new technology. New, innovative data gathering methods are needed with the increase of globalisation. One of the major advantages of technology is the elimination of distance and, thus, it is possible for any research problem to be empirically investigated over the internet. Netnography is still rare in education (Kulavuz-Onal & Va´squez, 2013). The study of

netnography in mega classes was the first research in education where this methodology was applied (O'Reilly, Rahinel, Foster & Patterson, 2007). Jennifer Sandlin also used netnography in an educational setting when she investigated learning in informal sites of consumer education (Sandlin, 2006). This study is the first netnographic case study in Afrikaans FAL of which I am aware.

Netnography is the result of the increase in informal online communities. Teachers may use the opportunities for investigating learner behaviour online that technology opens up and break down the barriers of time and space. I argue that more schools are currently using social media websites to increase communication in the school than previously but that the use of social media websites is also an advertising strategy. Platforms for interaction between the school role players are created with more electronic communication between the role players as compared to face-to-face interactions. In the educational context learners and their parents are the consumers, especially in private schools. It is essential that researchers who conduct inquiries in schools consider netnography as a qualitative research methodology to identify the virtual communities that they serve. Netnography was used for the purposes of this inquiry to investigate the effect of computer technology on learning in a multilingual language class with Kozinet's netnography methodology being adapted to this specific educational setting. In addition, the teacher can follow the learner's progress via the internet and collect valuable information about her progress on Turnitin.

6.4.4 Electronic data gathering

The empirical component in this study included anonymous online discussions in a blog by the learners, the observations of learners when they engaged in online-discussions, class observations via video recordings, semi-structured interviews with the learners via email, focus group discussions with the teachers and the information and communications technician in a chat room and the written texts of the learners which were uploaded on the Turnitin software program in an e-portfolio as the primary data. The learners posted their reflections of the technology-integrated lessons on a specially created blog, Afrikaans FAL Graad 11 blog. The blog was used by the learners to communicate with both the teacher and other learners and to reflect. The learners felt free to express themselves in a safe environment while they also had sufficient time in which to construct their thoughts and expressions. The Turnitin software was used to promote writing, to showcase excellent work on the part learners

and for the exchange of ideas between the learners and the teachers in an effort to improve the learners' Afrikaans FAL learning. In addition, the learners' progress could be monitored with the *Grade Mark* feature of Turnitin which provides an account of the types of errors as well as the frequencies of the errors. A customised *Quick Mark* comment (see Addendum A) gives the learners immediate access to the Afrikaans FAL grammar rules, thus ensuring the integration of grammar and creative writing.

The semi-structured interviews with the learners were conducted via e-mail to accommodate the learners who were very busy with their academic and extramural activities. The focus group discussions were conducted in a chatroom. One of the advantages of a focus group discussion in a chatroom is that it breaks down the barriers of time and place. The teachers went onto the chatroom when they had some time to spare and they commented on what others had said or they gave their own opinions of the topic under discussion. It was convenient for the learners and teachers to write in their own time because of a lack of sufficient time to conduct 19 interviews face-to-face as well as focus group discussions, particularly as one of the teachers was the deputy-principal and, therefore, extremely busy.

6.4.5 Adapted conceptual framework

This framework adapts the TPACK to incorporate two other theoretical frameworks. The primary task is the teaching and facilitation of Afrikaans FAL acquisition. The framework that underpins language acquisition is the FAL consisting of the content and the communication skills. FAL constitutes the content in the form of the grammar and language rules that learners have to master (CK).

The biggest challenge in this particular context was the great variation in language skills and attitudes in my learners which is the result of some of the economic and political changes that have taken place in South Africa. The classes are as a result very diversed with learners with different levels of Afrikaans proficiency. In order to provide each learner the best chance and to support each one to surpass his/her own zone of proximal development, as suggested by Vygotsky (1978), the teacher should address learners' individual needs. According to Vygotsky (1978) the zone of proximal development is the distance between what the learner knows and what the learner could potentially know. Through interaction, learners learn from one another in a social context, with the help of the teacher and capable peers, to acquire knowledge and skills. Teachers should provide learning opportunities for collaboration with experts

and powerful artefacts in order to bridge the distance between learners' current levels of understanding andtheir potential levels. Vygotsky therefore informs the pedagogy needed to teach this subject in this context and represents the PK knowledge in Figure 1-3 in Chapter 1. By providing individualised feedback on each individual student's level, technology makes individual learning possible, but only if it is ubiquitous and adopted by all role players. The third component of the framework is therefore technology (TK). Teachers must choose the correct technology based on pedagogical principles that can help the learner to grasp the content (Murray & Barnes, 1998, Levy, 1997). Technology is a teaching tool and must be used to integrate the learning and teaching methods with the available resources.

Teachers with a good TPACK framework apply technology as an integrative part of the teaching process. However, it is important that both teachers and learners are digital fluent, that support is provided by the management of the school and that teachers are committed to successfully integrating technology into their lessons. The language skill can be taught in the intersection between pedagogy and technology if technology is used effectively. Acquisition, however, also requires a solid foundation of content in the form of grammar and language knowledge and rules. Part of the acquisition therefore is situated in the intersection of all three knowledges, namely, TPACK.

6.5 Recommendations

- I propose that FAL teachers teach FAL using the Turnitin software. Transactional writing using authentic tasks or topics with Turnitin will ensure the integration of the all language components in Afrikaans FAL.
- Pre-service teachers must be trained how to teach within the TPACK Framework to enable them to integrate technology successfully in their teaching.
- In-service training is needed to upgrade the qualifications of teachers in rural areas and to help them to integrate technology in their teaching within the TPACK Framework in order to narrow the digital divide in South Africa.
- I propose that sound classroom management is required to ensure that learners remain focused on the task at hand because learners are easily distracted by other sites. It is essential that learners take responsibility for their own learning and they exercise self-discipline.

- I propose strong internet access because the lack thereof causes much frustration and a negative attitude towards technology integration.
- I propose digital writing be offered in schools to prepare learners for the demands they will face at the tertiary level and in the workplace.
- More language teachers need to adapt to the new digital era that necessitates the acquisition of new academic and professional literacy practices. Teachers must extend and enrich the digital literacies of the learners.

6.6 Future research

- Technology has enormous potential for netnography and the South African multicultural context is ideal for further studies on intercultural dialogue.
- The majority of teachers are not trained to teach with technology. However, in-service training, especially with the integration of technology, can be very expensive and also time consuming. Technology could address this problem by way of virtual teacher collaboration and, thus, there is a need to explore the issue of telecollaboration.
- A greater variety of methodologies need to be implemented to address specific problems regarding the TPACK framework.
- This study was conducted in a private school and in an environment in which the teachers were trained in and had been exposed to technology. Another future topic for TPACK research would be to investigate a similar process but focusing on teachers in a public school.
- More research is necessary to ascertain whether the schools are preparing learners sufficiently for the digital world and to investigate the impact of the lack of such training on both the progress of students in tertiary institutions and their functionality in the workplace.
- The sample used in the study included females only. It is, thus, suggested that a similar study is conducted with male and female language learners.
- This inquiry emphasised the value of written, corrective feedback and did not focus on instruction and assessment only in the language classrooms. I recommend that researchers develop effective and innovative frameworks for instruction and e-assessment in their classrooms.

- The focus in the study is Afrikaans as a First Additional Language only. It is, thus, suggested that a similar study is conducted with other languages.

6.7 Limitations of the study

- Turnitin requires learners and instructors who are digitally fluent while the learning process using Turnitin may be somewhat lengthy.
- It is not always easy to ensure the right composition of the group because, in netnographic research, the group must be representative of all people.
- This inquiry was a case study in an independent school where conditions differ from the conditions in government schools. In addition, it is applicable in an FAL classroom and, thus, other learning areas may not benefit from the study. Therefore, this inquiry is not generalisable.
- Another possible shortcoming of the study is the role played by the time-management of learners in their visiting and commenting on the blog. It was not always possible to allocate time during the lesson to ensure that the learners visited and gave feedback on the blog.
- Another problem was the management and control of the blog comments. The learners used pseudonyms because of the public domain while marks were not allocated for the blog comments. Consequently not all the learners commented on the blogs.
- The school's internet connection was sometimes extremely slow when the whole school was using it while, at other times, it did not work at all. This is one of the challenges of technology integration. Schools must therefore ensure that the learners have sufficient internet access. However, the annual licence fee of Turnitin may be expensive.
- The current curriculum is not based on technology. As a result, it was sometimes challenging to apply the current curriculum using technology. In addition, it was also time-consuming to plan computer lessons while striving to complete the curriculum.
- Some of the learners' laptops broke and had to go in for repairs. These laptops were sometimes in the IT department for two to three days to be repaired. However, the integration of Turnitin requires regular access to a computer. Several of the learners store personal information on their laptops and this may result in their laptops either crashing or working very

slowly. The Information and Computer Technology policy should address this issue while teachers should be aware of the problem and ensure that the policy is strictly enforced.

6.8 Conclusion

It was extremely rewarding for me when I received positive feedback from the learners via the data collection strategies. I enjoyed working with both the learners and the teachers during this inquiry and I was always amazed at the innovation and creativity that they displayed. I remember that I was very nervous when I started the inquiry. I firmly believe that technology, specifically Turnitin, can transform both a FAL teacher's teaching and the FAL classroom. Through active engagement with the content, learners integrate the language rules in their writing, thus making them more meaningful and constructive. It is evident that learners want to use technology for educational purposes. Technology makes FAL learning fun, different and interesting. Engagement with written, corrective feedback is required to enable learners to engage with the content and to make it meaningful to them. In addition, teachers need to design authentic learning opportunities that may lead to deep learning. This will encourage learners to take ownership of their learning while instilling the self-discipline which is needed in this digital society in which learners are able to obtain any information anytime and anywhere. We design technology in order to perform tasks more effectively and efficiently. I trust that this study will contribute both to FAL learning, especially Afrikaans in the multilingual South African context, and also to netnographic studies in education.

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ADDENDUM A: QUICK MARK COMMENTS

Heading	**Colour** **Word structures (blue)** **Sentence structures (pink)** **Punctuation (purple)** **Positive comments (yellow)**	**Explanation**
Woordstrukture (blou)		
Verkeerde woordkeuse	Blou	Die woord pas nie in die konteks van die sin nie. Kies ‘n ander gepaste woord.
Verkeerde vorm van die woord	Blou	Die woord is reg, maar die vorm is nie reg nie, bv. reg man – reg**te** man Die goed kind – die goe**ie** kind Kind – kind**ers**
Spelling	Blou	Soek die korrekte spelling in ‘n woordeboek op.
Woordstrukture: herhaling	Blou	Die woord word herhaal. Verwyder die woord of gebruik ‘n ander woord.
Engelse woord	Blou	Engels is onaanvaarbaar. Soek die korrekte Afrikaanse woord in ‘n woordeboek op.
Sinstrukture (pienk)		
Sinstrukture: woordorde	Pienk	**Werkwoord 1** moet altyd in die **tweede posisie** van die sin wees en **werkwoord 2** aan die einde van die sin voor die infinitief. S v1 T O M P v2 I T v1 S O M P v2 I **Lydende vorm** Teenwoordige tyd: O + word+T+M+deur+S+P+ge

Heading	Colour Word structures (blue) Sentence structures (pink) Punctuation (purple) Positive comments (yellow)	Explanation
		(verb) Verlede tyd: O + is +T+M+deur+S+P+ge (verb) Toekomende tyd en ander hulpwerkwoorde (sal, sou, kan, kon, moet, moes, mag, wil, wou): O + hulpwerkwoord +T+M+deur+S+P+ge (verb)+ **word** **M v1 S T O P v2 I** **P v1 S T O M v2 I** **I v1 S T O M P v2** In die verlede of toekomende tyd of as hulpwerkwoorde gebruik word, moet werkwoord 1 in die 2de posisisie wees en werkwoord 2 aan die einde voor die infinitief
Sinstrukture: verlede tyd	Pienk	Dit het alreeds gebeur en moet in die verlede tyd geskryf word. het – ge kan – kon moet – moes sal – sou wil – wou Werkwoorde wat begin met be-, her-, ver-, er-, mis-, ont- kry nie ge- vooraan nie Laat, gaan, probeer, begin, sien, hoor moet voor werkwoord 2 gebruik word waar twee

Heading	Colour Word structures (blue) Sentence structures (pink) Punctuation (purple) Positive comments (yellow)	Explanation
		werkwoorde in die sin voorkom. Skeibare werkwoorde bv. Hy maak die deur toe. Hy het die deur toegemaak. DAWN – **dan, as, wanneer, nou** verander na **toe** in die verlede tyd
Sinstrukture: toekomende tyd	Pienk	Dit gaan nog gebeur en moet in die toekomende tyd geskryf word sal – werkwoord 2 kan – sal....kan werkwoord 2 moet – sal....moet werkwoord 2 wil – sal....wil werkwoord 2 **laat, gaan, probeer, begin, sien,** hoor moet voor werkwoord 2 gebruik word waar twee werkwoorde in die sin voorkom. Skeibare werkwoorde bv. Hy maak die deur toe. Hy sal die deur **toemaak.**
Sinstrukture: teenwoordige tyd	Pienk	Dit gebeur nou en moet in die teenwoordige tyd gebruik word. Gewoonlik is daar net een werkwoord in die tweede posisie. Skeibare werkwoorde: Werkwoord 1 in die tweede posisie en voorsetsel aan die einde van die sin bv. Hy **maak** die deur **toe.**
Sinstrukture: onverstaanbaar	Pienk	Verander die hele sin om dit duideliker te stel.

Heading	**Colour** **Word structures (blue)** **Sentence structures (pink)** **Punctuation (purple)** **Positive comments (yellow)**	**Explanation**
Sinstrukture: nie korrekte Afrikaans nie	Pienk	Verbeter die sin.
Sinstrukture: woord uitgelaat	Pienk	‘n Woord is uitgelaat; plaas die regte woord op die regte plek
Sinstrukture: ontkenning	Pienk	Kyk na die regte gebruik van die negatief. Baie keer is die laaste **nie** uitgelaat.
Punktuasie		
Punktuasie	Pers	Dit kan enige punktuasie wees: Hoofletter, komma (**,**), punt (**.**), dubbelpunt (**:**), kommapunt (**;**) dit word tussen twee sinne in die plek van die voegwoord gebruik.
Positiewe kommentaar (geel)		
Uitsonderlike skryfwerk	Geel	Dis baie mooi gestel. Puik!!

ADDENDUM B: ETHICS CLEARANCE CERTIFICATE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Education

RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	CLEARANCE NUMBER : HU 12/04/01
DEGREE AND PROJECT	PhD The effect of computer technology on learning in a multi-linguistic language class
INVESTIGATOR(S)	Eva Sujee
DEPARTMENT	Humanities Education
DATE CONSIDERED	27 March 2015
DECISION OF THE COMMITTEE	APPROVED

Please note:
For Masters applications, ethical clearance is valid for 2 years
For PhD applications, ethical clearance is valid for 3 years.

CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn

DATE: 27 March 2015

CC: Jeannie Beukes
Liesel Ebersöhn
Dr L Nagel
Dr A Engelbrecht

This ethical clearance certificate is issued subject to the following condition:

1. It remains the students' responsibility to ensure that all the necessary forms for informed consent are kept for future queries.

Please quote the clearance number in all enquiries.

ADDENDUM C: LETTER TO THE PRINCIPAL

February 2012

The Principal

XXX

P.O. Box 11379

XXX

0028

Dear Sir

Re: Permission to conduct research at XXX

Research project title: The effect of computer technology on learning in a multi-lingual class

I am Eva Sujee, a teacher at XXX, XXX who is currently enrolled for a Doctoral degree in Humanities Education at the University of Pretoria's Faculty of Education. I plan to complete my doctoral study titled: The effect of computer technology on learning in a multi-lingual class. I therefore request permission to conduct research at XXX.

The aim of this research is to establish the effect of computer technology on learning in a multi-lingual class. I want to use technology as a means to address the different levels in the Afrikaans First Additional Language classes and to investigate new ways in which technology can be used in the classroom to help learners to develop to their full potential. Participation of learners and educators in this project will help them both to reflect on their learning and teaching processes.

My supervisor for this project is Dr. Alta Engelbrecht who is a lecturer in the Department of Humanities Education at the University of Pretoria's Faculty of Education.

Should you require clarification on the project you can contact me or my supervisor at the following addresses:

Researcher:	Supervisor:
Eva Sujee	Dr. Alta Engelbrecht

P.O. Box 39473
Moreletapark
0028
Education

Cellphone: 0835562724

Email: esujee@stmarys.pta.school.za

University of Pretoria
Faculty of Education
Department of Humanities

Cellphone: 082987099

Email: Alta.Engelbrecht@up.ac.za

Your cooperation in this regard will be highly appreciated.

Yours faithfully

_____

Eva Sujee

Researcher's signature: _____ Date: _____

Supervisor's signature: _____ Date: _____

ADDENDUM D: LEARNER CONSENT FORM

January 2014

Dear _____

RE: Request to participate in a Research Project

Research project title: The effect of computer technology on learning in a multi-lingual class

Kindly read the information in this letter regarding the research project so that you can make an informed decision about your voluntary participation or not.

Purpose of the Research Study

You are kindly invited to participate in a research project aimed at gaining some insight into the effective role of technology in enhancing academic success in a First Additional Language classroom at XXX

What you will be asked to do

1. Be observed during your lessons.
2. Be interviewed individually by the researcher on your experiences of the use of technology in the First Additional Language.
3. Write a blog (reflective journal) where you will record all your experiences of the use of technology in the First Additional Language.

Time required

Interview sessions will last for about 45 minutes to an hour per session. There will be four different sessions which will spread over a period of one week intervals. The blog will be written in two phases: after the second and last interview.

Risks and benefits

Risks: There is no anticipated risk or harm to you. The purpose of the observation, interview and reflective journal is not meant to assess you in any way and the results will not be used anywhere else outside this research study.

Benefits: By participating in this study, you will have an opportunity to understand your individual learning process as you reflect on your interpretation of effective use of technology in the First Additional Language classroom. These reflections will also enable you to think about how you can optimise your own learning through the effective use of technology.

Voluntary participation and confidentiality

Your participation in this study is voluntary. Should you declare yourself willing to participate in the study, confidentiality is guaranteed. Your name will not appear anywhere in the research report.

Right to withdraw from the study

You may decide to withdraw from the research study without any penalty or prejudice at any time of the process.

Agreement: I have read, understood and considered the above, which indicate the researcher's intentions and request for my participation in the research project. I voluntarily agree to participate in the research project. I hereby show my willingness to participate in the study signing below.

Learner's signature: _____ Date: 31 January 2014

Video recording:

The researcher will wish to video-record the classroom observations and hereby seek permission to do this.

Agreement: I understand that there will be video-recording of classroom observations, which will only be used for the purposes of the research project without the name and picture appearing anywhere in the research report.

I agree to video-recording:

Learner's signature: _____ Date: 31 January 2014

Should you require clarification on the project you can contact me or my supervisor at the following addresses:

Researcher:
Eva Sujee
P.O. Box 39473
Moreletapark
0028
Cell phone: 0835562724
Email: esujee@stmarys.pta.school.za

Supervisor:
Dr. Alta Engelbrecht
University of Pretoria
Faculty of Education
Department of Humanities Education
Cell phone: 082987099
Email: Alta.Engelbrecht@up.ac.za

ADDENDUM E: PARENT CONSENT FORM

January 2014

Dear Parents/ Guardians of _____

RE: Request to participate in a Research Project

Research project title: The effect of computer technology on learning in a multi-lingual class

Kindly read the information in this letter regarding the research project so that you can make an informed decision about your voluntary participation or not.

Purpose of the Research Study

You are kindly invited to participate in a research project aimed at gaining some insight into the effective role of technology in enhancing academic success in a First Additional Language classroom.

What you will be asked to do

1. Be observed during your lessons.
2. Be interviewed individually by the researcher on your experiences of the use of technology in the First Additional Language.
3. Write a blog (reflective journal) where you will record all your experiences of the use of technology in the First Additional Language.

Time required

Interview sessions will last for about 45 minutes to an hour per session. There will be four different sessions which will spread over a period of one week intervals. The blog will be written in two phases: after the second and last interview.

Risks and benefits

Risks: There is no anticipated risk or harm to you. The purpose of the observation, interview and reflective journal is not meant to assess you in any way and the results will not be used anywhere else outside this research study.

Benefits: By participating in this study, you will have an opportunity to understand your individual learning process as you reflect on your interpretation of effective use of technology in the First Additional Language class room. These reflections will also enable you to think about how you can optimise your own learning through the effective use of technology.

Voluntary participation and confidentiality

Your participation in this study is voluntary. Should you declare yourself willing to participate in the study, confidentiality is guaranteed. Your name will not appear anywhere in the research report.

Right to withdraw from the study

You may decide to withdraw from the research study without any penalty or prejudice at any time of the process.

Agreement: I have read, understood and considered the above, which indicate the researcher's intentions and request for my participation in the research project. I voluntarily agree to participate in the research project. I hereby show my willingness to participate in the study signing below.

Parent/Guardian's signature: _____ **Date: 31 January 2014**

Video recording:

The researcher will wish to video-record the classroom observations and hereby seek permission to do this.

Agreement: I understand that there will be video-recording of classroom observations, which will only be used for the purposes of the research project without the name and picture appearing anywhere in the research report.

I agree to video-recording:

Parent/Guardian's signature: _____ **Date: 31 January 2014**

Should you require clarification on the project you can contact me or my supervisor at the following addresses:

Researcher:
Eva Sujee
P.O. Box 39473
Moreletapark
0028
Education
Cellphone: 0835562724
Email: esujee@stmarys.pta.school.za

Supervisor:
Dr. Alta Engelbrecht
University of Pretoria
Faculty of Education
Department of Humanities

Cellphone: 082987099
Email: Alta.Engelbrecht@up.ac.za

ADDENDUM F: TEACHER CONSENT FORM

June 2014

Dear Teacher

RE: Request to participate in a Research Project

Research project title: The effect of computer technology on learning in a multi-lingual class

Kindly read the information in this letter regarding the research project so that you can make an informed decision about your voluntary participation or not.

Purpose of the Research Study

You are kindly invited to participate in a research project aimed at gaining some insight into the role of technology in enhancing academic success in a First Additional Language classroom at XXX.

What you will be asked to do

1. To observe a lesson
2. Be part of a focus group discussion in a chat room on your experiences of the use of technology in the First Additional Language

Time required

Discussion sessions will last for one week. You can go onto the chat room when you have time available and comment on the comments from other teachers of give your own input.

Risks and benefits

Risks: There is no anticipated risk or harm to you. The purpose of the observation and focus group discussions is not meant to assess you in any way and the results will not be used anywhere else outside this research study.

Benefits: By participating in this study, you will have an opportunity to reflect on your interpretation of the effective use of technology in the First Additional Language class room. These reflections will also enable you to think about how you can optimise your education practice through the effective use of technology.

Voluntary participation and confidentiality

Your participation in this study is voluntary. Should you declare yourself willing to participate in the study, confidentiality is guaranteed. Your name will not appear anywhere in the research report.

Right to withdraw from the study

You may decide to withdraw from the study at any stage should you wish not to continue.

Agreement: I have read, understood and considered the above, which indicate the researcher's intentions and request for my participation in the research project. I voluntarily agree to participate in the research project. I hereby show my willingness to participate in the study signing below.

Teacher's signature: ________ Date: _____

Audio and Video recording:

The researcher will wish to use the data in the focus group discussions with you and video-record the classroom observations and hereby seek permission to do this.

Agreement: I understand that the focus group discussions in the chat room and video-recording of classroom observations, which will only be used for the purposes of the research project without the name and picture appearing anywhere in the research report.

I agree to the focus group discussions in the chat room:

Teacher's signature: _____ Date: _____

I agree to video-recording:

Teacher's signature: ________ Date: _____

Should you require clarification on the project you can contact me or my supervisor at the following addresses:

Researcher:
Eva Sujee
P.O. Box 39473
Moreletapark
0028
Education
Cellphone: 0835562724
Email: esujee@stmarys.pta.school.za
Alta.Engelbrecht@up.ac.za

Supervisor:
Dr. Alta Engelbrecht
University of Pretoria
Faculty of Education
Department of Humanities

Cellphone: 082987099
Email:

ADDENDUM G: QUESTIONS FOR INDIVIDUAL INTERVIEW WITH LEARNERS

1. Please tell me what is your personal believes about the role of technology in your class?

2. How would you describe your current level of computer proficiency

3. How did you acquire these technological skills?

4. Describe how you use technology outside the classroom.

5. Describe a 'positive' experience with technology?

6. Describe a 'negative' experience with technology?

7. Are there any other experiences that have influenced your use of technology?

8. How does technology help you in your learning and what problems does technology solve?

9. Name at least three advantages of technology use for you in the Afrikaans First Additional Language classroom.

10. Do you enjoy tasks that require the use of technology? Motivate your answer.

11. Describe an example of a "successful" use of technology in your Afrikaans classroom. Include information about the roles you and the technology played; the goal of the activity; its relevance to the curriculum; and did you benefit from the activity.

12. In your opinion, does the use of technology address any of the following 21st century skills:

13. If you could put your finger on one thing that influenced you the most in terms of integrating technology in the classroom, what would that one thing be?

14. Regarding computers and technology integration, what would you like to learn more about?

15. If you could make a recommendation to other learners and teachers who wanted to do more with technology in their classrooms, what recommendation would you make?

16. Comment on the existing school culture with regards to the use of technology.

17. Would you recommend the use of technology to another school? Why?

18. Describe your available technology resources (e.g., number/type of computers and peripherals; where located; support personnel).

19. How would you describe the technical support regarding technological skills at your school?

20. Describe your relationship with the technical staff at school.

21. Describe your relationship with the administrative staff at school that influences the use of technology.

22. What else could your school do to support your computer use in your classroom?

23. Do you the teacher address your individual needs? How?

24. How can the teacher address your individual needs with the help of technology?

ADDENDUM H: QUESTIONS FOR FOCUS GROUP DISCUSSIONS

Topics for discussion

Turnitin software

1. What do you think of the Turnitin software?

Personal beliefs about the effect of technology

2. What are your personal believes about the role of technology in your class?

Integration of technology

3. Do you enjoy integrating technology into your teaching? Motivate
4. What is necessary for successful technology integration?
5. Do you think technology motivates learners?

Technical support

6. Can you comment on the technicians and IT department.
7. Do you think it contributes and is essential for technology integration?

Technologies

8. Can you tell me what technologies are you using in your class?

Addressing individual needs

9. Does technology help you to address the individual needs of learners?

Technical proficiency

10. How are your technical skills and how did you acquire it?

Challenges

11. What are the challenges that you think hinder successful integration of technology?

Technology integration

12. Describe an example of a “successful” use of technology in your classroom.
13. What would that one thing be that influenced the integrating of technology the most?
14. Do you think it contributes and is essential for technology integration?
15. Would you recommend technology to another school and why?

Twenty first century skills

16. Do you think technology addresses the 21st century skills?

School culture

17. Comment on the existing school culture with regards to the use of technology. Is there a culture of technology use and innovation?
18. What else could your school do to support your computer use in your classroom?

Technical support

19. How would you describe the technical support regarding technological skills at your school?

Curriculum change

20. How did the curriculum change with the use of technology?
21. What are the effects of the changes in the curriculum on the learners and on you as a teacher?
22. Comment on the content and skills acquire in a First Additional language class room needed for the demands of the digital environment. How did the environment change with the increase of technology in everyday life?

Assessments

23. How did assessments change with the use of technology? What are the advantages and disadvantages?

Teaching styles and strategies

24. What teaching strategies or approaches are you using in order for learners to have a better understanding of the content?
25. Did your teaching style change is this new technical school environment? How did your teaching style changed?
26. How do you go about choosing a technology for a particular lesson?
27. What advice would you give another First Additional Language teacher who is starting using technology in a lesson?
28. How would you describe a successful technology integrated lesson?
29. In your experience as a First Additional Language teacher, how would you describe the factors that influences learning in a First Additional Language?
30. In your opinion, does age and gender of teachers have any influence on the integration of technology in the class?
31. How does technology contribute to collaborative learning and knowledge building?
32. What is the role of social media in First Additional Language learning?
33. Give any suggestions of lessons where technology can be used to enhance First Additional Language learning.

Class atmosphere

34. How would you describe your class atmosphere?
35. How does your class atmosphere influence the integration of technology?

Attitude of learners

36. How do you experience the learners' attitude towards Afrikaans?
37. Does it influence their performance in Afrikaans as a First Additional Language?
38. In your opinion, how can technology be used to motivate learners?

ADDENDUM I: GENERATED DATA AND DATA ANALYSIS DOCUMENT

F1: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 1

F2: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 2

F3: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 3

F4: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 4

F5: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 5

F6: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 6

F7: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 7

F8: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 8

F9: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 9

F10: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 10

F11: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 11

F12: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 12

F13: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 13

F14: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 14

F15: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 15

F16: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 16

F17: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 17

F18: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 18

F19: TRANSCRIPTION OF INDIVIDUAL INTERVIEWS WITH PARTICIPANT 19

F20: TRANSCRIPTION OF REFLECTIONS OF THE LEARNERS ON THE BLOG

F21: TRANSCRIPTION OF FOCUS GROUP DISCUSSIONS WITH TEACHERS

F22: VIDEO RECORDING OF LESSON: Chat rooms

F23: VIDEO RECORDING OF LESSON: Blogging

F24: VIDEO RECORDING OF LESSON: Smart board

F25: VIDEO RECORDING OF LESSON: Smart Response Simulator

F26: VIDEO RECORDING OF LESSON: Turnitin

F27: FIELD NOTES

F28: HERMENEUTIC UNIT – THE EFFECT OF COMPUTER TECHNLOGY ON LEARNING IN A MULTILINGUISTIC LANGUAGE CLASS (ATLAS.Ti 7.5.6)

F29: HERMENEUTIC UNIT AS HTML REPORT (ATLAS.ti 7.5.6)

ADDENDUM J: DECLARATIONS FROM LANGUAGE EDITOR

Alexa Barnby

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31 March 2015

To whom it may concern

This is to certify that I, Alexa Kirsten Barnby (BA Hons), ID No. 5106090097080, a language practitioner registered with SATI and in the fulltime employ of the Language Services Directorate of the University of South Africa, have edited the doctoral thesis entitled "The effect of computer technology on learning in a multilinguistic language class" by Mrs Eva Sujee. The onus is, however, on the author to effect the corrections and changes suggested.

Signed: