The viability of computer-based interventions in Afrikaans First Additional Language teaching

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Submitted in partial fulfilment of the requirements for the Degree in Magister Educationes in the Faculty of Education, University of Pretoria.

Supervisor

Dr. M. Mihai

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DECLARATION

I declare that the dissertation, which I hereby submit for the degree of Magister Educationis at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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ABSTRACT

To achieve a National Senior Certification, all South African candidates must select two official South African languages, one on Home Language (HL) level and another on First Additional Language (FAL) level. With the FAL often being a language in which the learner commonly lacks comprehension or assistance at home and therefore becomes subject to motivational barriers, additional support from the teacher is necessary. With additional barriers such as time constraints in completing the curriculum, teachers need to explore alternative paths to supply students with the necessary support. Previous research recognises the success of computer-based interventions in STEM subjects, but few studies have been done to establish the viability of similar interventions in FAL teaching. This research is focused on establishing whether these can be successfully implemented by Afrikaans FAL teachers to extend language learning and alleviate issues such as motivational barriers and time constraints, while improving vocabulary, comprehension and grammatical application. A computer-based intervention focused on learning complex Afrikaans language structures was offered to a group of Gr 7 Afrikaans FAL learners, after which the researcher engaged in interviews with participants. Additional comparative data was acquired through pre- and post-intervention surveys. A qualitative research approach was followed to better understand specific aspects affecting participants' opinions of the viability of the intervention regarding the application of the technology, covering of the academic content and design of the intervention.

Key words: Afrikaans FAL, intervention, computer-based interventions, qualitative intervention research, language teaching, teaching barriers

LANGUAGE EDITOR'S DISCLAIMER

I do hereby confirm that I have proof-read the dissertation entitled:

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Chapter 1: Introduction

1.1 Introduction

The value of learning with technology is recognised and promoted in the South African education system (Gillwald, Moyo, & Stork, 2012; "Second phase 'Big switch on' paperless classrooms programme," July 21, 2015; "Western Cape drives e-learning initiative," 27 July 2017). It was stated by the Minister of Basic Education that "learners who continue to use Information Communication Technology (ICT) in doing their assignments and projects begin to cultivate a culture of personal information management, independent learning and working without supervision, communication skills, teamwork and research skills" ("The Big Switch On brings tablets to seven schools," 15 January 2015).

Studies such as those done by De Jong, Sotiriou, and Gillet (2014) and Potkonjak, Gardner, Callaghan, Mattila, Guetl, Petrović and Jovanović (2016) highlight the successes of technology implementation in the field of Science, Technology, Engineering and Mathematics (STEM) education. Research done by Bester and Brand (2013) have indicated positive results in learners' attention and achievement when implementing technology to not only STEM subjects such as Mathematics, but also to non-STEM subjects, including languages.

Teaching an additional language has its own unique challenges regarding learner motivation, cooperation and comprehension (Condy & Blease, 2014; Gardner, 2014). Learners are using technology daily in their personal lives and it would be ignorant not to harness that skill into their academic moulding (Gurung & Rutledge, 2014), both to increase motivation and cognition. In an attempt to develop knowledge regarding the feasibility of using technology-based learning in additional language teaching, the researcher investigated challenges and successes experienced by learners when learning new language structures purely through computer-based activities designed to guide them through the learning process.

1.2 Background to the study

The setting of the study was an affluent private school in Centurion. The school offers education to learners from Gr 0000 to Gr 12. As the school is a client of the Independent Examinations Board (IEB), it follows an advanced system of assessment. However, it is still subject to the stipulations specified in the Department of Education policy document regarding the requirements for the National Senior Certificate (IEB, 2013).

To achieve a National Senior Certificate, South African learners in Gr 10 – 12 must comply with specific subject selections. One of the specifications requires a learner to select two official languages, one on Home Language (HL) level and another on First Additional Language (FAL) level (DoE, 2010). The school in the study offers English on HL level, but in Gr 4 learners make a choice between Afrikaans and isiZulu to continue with on FAL level, after being exposed to both languages during the Foundation Phase (Gr 1 – 3).

The IEB offers four advanced programme courses, all of which are also made available to public schools. The courses that are available, are Advanced Programme English, Advanced Programme Mathematics, Advanced Programme Physics and Advanced Programme Afrikaans. The purpose of these advanced courses is to prepare learners for tertiary study (IEB, 2018). As one of the additional subjects is Advanced Programme Afrikaans, the emphasis that the IEB places on Afrikaans needs to be recognised and the subject developed, including the FAL level.

Even though the population of the school's learners consists of an equal amount of black, white and Indian learners and speakers of all official languages are represented in the school, more than 80% still choose to continue with Afrikaans as FAL, in comparison to isiZulu. In adhering to stipulations in the NCS document (DoE, 2013b), immigrant children also have to offer a language on FAL level up to Gr 9 and it has been noted that most immigrants in the school also choose Afrikaans. With so many learners from different language backgrounds, many have very little contact with and exposure to Afrikaans at home and struggle with the basic concepts and vocabulary of the language.

As learners make their choice of FAL in Gr 4, the Intermediate Phase (Gr 4 – 6) is of great importance to establish a sound knowledge of the language. With many of the learners having access to computer technology at home, digital resources to assist in additional reinforcement of concepts have been offered to all Afrikaans FAL learners in the Intermediate Phase. These resources range from drill and practise exercises to improve vocabulary and reading (Quizlet, Readers are Leaders), to online quizzes, worksheets and other activities made available on the learning management system Edmodo. Although all learners have equal access to the resources, not all make use of the opportunity to access it at home.

By the time learners enter the Senior phase, all language and spelling concepts have already been introduced as dictated by the CAPS document (DoE, 2013a). With an intensified focus on literature studies, less time is given to formal teaching of language structures. This proves damaging to learners who still need assistance with these concepts, especially with the increased vocabulary and comprehension requirements of complicated prescribed texts. However, limited time allocation to the subject prohibits extensive teaching and revision of these concepts during school hours. Since the learners at the school are already familiar with computer-technology in revising concepts, the possibility arose of using the same technology to not only practise concepts, but to actively learn concepts as well, thus allowing learners to access the learning material from any place at any time. Successes in using computer-based technology in the teaching and learning of other subjects, especially STEM subjects, have been recorded (De Jong et al., 2014; Potkonjak et al., 2016) and the value of this technology in teaching an additional language needs to be explored in order to promote understanding of the language concepts.

As the viability of using computer-technology in learning difficult concepts in Afrikaans as a first additional language have never been investigated in the school, an intervention study first needed to be conducted to verify the feasibility of such an endeavour. During the intervention, multiple computer-based activities were designed which focused on introducing the language concept, motivating learner interaction to broaden cognition, as

well as creative tasks to give learners the opportunity to apply and exhibit their understanding of the concept.

With Grade 7 being the first year in the Senior phase, yet the last year in the primary section of the school, the study focused on them. The specific Grade 7 group received their Afrikaans instruction in the ICT classroom, which posed a unique opportunity for them as they had already used computer-technology in various subject-related activities during the year. They were therefore familiar with using computer-technology in revision as well as in assessment situations, but not yet in the formal learning of concepts.

The ICT classroom is fitted with laptops which connect to the Internet via Wi-Fi. Learners' work is stored either on the server, or on learners' Microsoft OneDrive accounts. As each learner has a unique username and password which gives them access to any of the school's devices, as well as their own Microsoft accounts, it was decided that MS OneNote, MS Forms and suitable web-based applications would be used as a platform for the intervention.

1.3 Rationale

The value of learning with computer-based technology in especially STEM subjects, is recognised and promoted in several studies (De Jong et al., 2014; Potkonjak et al., 2016). However, computer technology is not limited to only STEM subjects, but to all academic disciplines and promoted as such by the South African education system ("The Big Switch On brings tablets to seven schools," 15 January 2015).

Learning a first additional language is compulsory in the current South African school curriculum (DoE, 2010). An additional language is often met with negativity from learners and parents. As the research of Condy and Blease (2014) and Gardner (2014) indicate, challenges with vocabulary, complex language structures and outdated teaching methods are often paired with little or no assistance at home, which leads to frustration and lack of motivation from learners.

Learners are using technology increasingly in their daily lives and it would be ignorant for teachers not to harness this phenomenon into the academic moulding of their students. It is therefore beneficial to establish the viability of using computer-based technology to address the challenges in learning an additional language. The research initiative of this study was to determine the value of computer-based interventions in teaching and learning complex language structures within Afrikaans as an additional language.

1.4 Problem statement

With much being done to improve the implementation of technology into South African classrooms ("The Big Switch On brings tablets to seven schools," 15 January 2015; "Western Cape drives e-learning initiative," 27 July 2017), it is incomprehensible that teachers are still hesitant to utilise this increasing technology. They reason that the use of technology will restrict the time the learners have to cover specific content (Herreid & Schiller, 2013). Yet, with learners becoming more digitally focussed, it is imperative that teachers need to adapt their methods to incorporate the extensive use of technology into their teaching (Ertmer & Ottenbreit-Leftwich, 2010).

In this research study, the viability of implementing computer-based interventions to elucidate factors such as lack of motivation, weak support structures, complex language structures and time constraints teaching a strenuous curriculum (Condy & Blease, 2014; R. C. Gardner, 2014) was explored in order to elevate the learning of Afrikaans as an additional language.

As computer-based interventions are not bound to a specific time and place, it is important to establish the viability of such interventions as the vehicle of instruction in Afrikaans FAL in order to alleviate aforementioned obstacles, as it will allow learners to continue studying the prescribed subject matter in extended settings such as at home or informal study groups, increasing their motivation and cognition of the content.

1.5 Purpose statement

Many Afrikaans FAL teachers face intricacies such as learner motivation and the challenges of time constraints in completing a strenuous curriculum. As 21st century

learners rely on technology to make learning available to them at any place and at any time (Greener & Wakefield, 2015), applying computer-based interventions as a vehicle of instruction of grammar aspects can make language interventions available to learners at any place and time, alleviating the aforementioned challenges.

1.6 Research questions

Central question: In which ways can computer-based interventions improve learner motivation in, and cognition of complex language structures in Afrikaans as a first additional language?

Sub question 1: What challenges or benefits are experienced by learners when using computer technology in their own learning?

Sub question 2: How does correspondence between computer-based interventions designed in relation to the SAMR model and learning outcomes described in Bloom's Revised Taxonomy, contribute to establishing a progressive intervention in complex language structures in Afrikaans as a first additional language?

Sub question 3: How is learner motivation and cognition revised with the introduction of computer-based interventions in Afrikaans as a first additional language?

1.7 Conclusion

Offering an additional language to obtain the national senior certificate (NSC) is compulsory in South African schools. In reviewing the challenges teachers face regarding student motivation and cognition, as well as time constraints and a taxing curriculum, the need for alternative methods to teach Afrikaans FAL became evident. In an attempt to investigate innovative solutions to the problem, the feasibility of using computer-based interventions to meet this need was investigated during this study.

Chapter 2: Literature review

2.1 Introduction

The content of this chapter highlights previous research into issues that influenced the current study. The conceptual framework that was applied by the researcher in the research design and the intervention, and which established a sustaining relationship between the application of digital and curriculum content within the intervention, is also illustrated in this section.

Since the purpose of the study focused on how technology can be used to alleviate issues such as learner motivation and time constraints in the teaching of curriculum content, the focus of this literature review was on topics that addressed language teaching, the use of computer technology in teaching and the roll of the teacher in the design and implementation of intervention strategies.

Literature is not deficient when it comes to studies regarding the implementation of technology into teaching practice and the results thereof (Guimarães et al., 2018; Liaw, Huang, Liaw, & Liaw, 2016; Van Laar, Van Deursen, Van Dijk, & De Haan, 2017; Wollscheid, Sjaastad, & Tømte, 2016). Researchers differ in their findings towards the effectivity and usefulness of computer integration as well as teachers' perspectives towards the use of technology in pedagogy, proving that discrepancy still exists in this field. While authors such as Bitter and Legacy (2008) identify the benefit of technology integration to the students, motivating students to be more engaged and resulting in higher retention and better comprehension, a global study done by the OECD (2015) identifies that learners actually achieve lower results when using computer technology in the classroom.

It is with this discrepancy in mind that the researcher aimed to identify whether computer-based interventions will in fact be beneficial or detrimental in the motivation, comprehension and engagement of Afrikaans FAL learners.

2.2 Implementation of ICT in teaching

It is stated in a publication by the OECD (2015) that rapid advances in information and communication technology are continuously transforming the face of education. 21st century learners need to be equipped to navigate in an increasing digital environment and to responsibly access the plethora of resources that are available to them via online platforms.

Teachers perceive the benefits of blended and ubiquitous learning to be advantageous to their students and are motivated to implement technology in their teaching practice. Literature is rich with studies showcasing the successes of case studies where implementation was advantageous to the population (Eguchi, 2016; Liaw et al., 2016; Potkonjak et al., 2016) as well as quantitative studies to support the use of technology in assessment (Guerrero-Roldán & Noguera, 2018; Spector et al., 2016).

It is therefore easy to assume that technology implementation will be without opposition, reflecting positive outcomes and that learners will automatically and with excitement except the digital vehicle of instruction. However, this is not always the case. Technology implementation is not always without obstacles (Howard & Mozejko, 2015; Rabah, 2015) and teachers need to make themselves aware of both the triumphs and pitfalls in order to assist them in thorough preparation when implementing ICT in their own teaching.

2.2.1 Learners' competency regarding ICT

It is often assumed that all learners are digitally competent and find using technology easy and preferable. The research of Aesaert, Van Nijlen, Vanderlinde, Tondeur, Devlieger, and Van Braak (2015) stemmed from this assumption and found it not to be the case. According to their research, the technology competence in retrieving and managing data, as well as the communication of digital information of most primary school pupils, is moderate to low. Although Beaudoin, Kurtz, and Eden (2009) find in their research that familiarity with the proposed technology is one of the lowest factors influencing the success of e-learning, there might still be a possibility that younger learners who have a

low digital competency might have difficulty navigating a computer-based intervention, ultimately diminishing their commitment towards the content or subject.

Aesaert and Van Braak (2014) note that learners' computer efficiency and their perceived self-efficacy in using technology both impact their achievement in digital learning environments. It is therefore important for teachers to consider learners' ICT competencies when designing learning interventions and implementing technology, in order to ensure optimum achievement.

However, Aesaert et al. (2015) also stress the importance that learners play in their own technology development by stating that "the more pupils report that they plan, monitor and regulate their learning process while learning, the higher their ability in digital information processing and communication" (p. 66). The process of engaging in computer-based interventions can therefore have an enhancing effect on both the technological skill and academic cognition of the learner.

2.2.2 Time management

A recurring issue that was identified by Tondeur, Van Braak, Ertmer, and Ottenbreit-Leftwich (2017) is that teachers often noted that the use of ICT in their lessons takes more time than traditional teaching methods. Maré and Mihai (2018) also found this to be a factor that influences teachers' decisions in including the use of ICT activities in their lessons. Cumming, Strnadová, and Singh (2014) mention that the setting up, updating and maintenance of devices are time consuming. Teachers should therefore also include, in their planning, the time that managing these aspects require, when deciding to make use of digital activities in their lessons.

However, studies also recognise the benefits that ICT implementation has to time management and how it can be used to extend time that students spend on learning. Harris (2017) states that one of the main purposes of integrating digital activities in collaboration with traditional face-to-face teaching, is to augment teaching and planning time. Online assignments can be done in class, but also at home, which provides the learner with more time to consolidate learning.

An observation that supports the notion that electronic assignments can be time saving, is that audiobooks take less time to complete than printed versions (Cumming et al., 2014).While Taipale (2014) found that reading speed comparing printed and electronic texts related to length and typography; his study concluded that learners find that they type faster than when writing on paper, which also reduces time.

When teachers contemplate implementing computer technologies in their teaching, they should weigh the challenges against the benefits and consider the advantages of integration.

2.2.3 Multiple benefits of computer integration

Maré and Mihai (2018) found that one of the motivating factors that inspires teachers to implement technology into their teaching, is the advantage that it will have on the learners. Examples of the benefits of computer integration in classrooms have been identified by numerous authors (Bester & Brand, 2013; Cumming et al., 2014; Ferrer, Belvís, & Pàmies, 2011) and contribute to convincing teachers to pursue this practice to enhance student motivation and cognition.

The nature of online learning experiences is that “they bridge forms of knowledge and literacy, and they intersect places of learning – home, school, work and community” (Livingstone, 2012, p. 10). This proposes that computer-based interventions are not limited to the classroom but can continue outside the formal setting. While students in the study of Beaudoin et al. (2009) acknowledged that they needed to apply self-management skills in order to extend their learning outside a formal setting, they expressed their satisfaction at being able to learn at any place and at any time.

However, computer-based activities do not only have benefits in that they can be applied outside the classroom. The benefits that teachers perceive their learners to experience while using the technologies in the classroom, are also multiple. Cumming et al. (2014) illustrated how different activities and applications can support learners with different learning styles and academic abilities and commented on how the inclusion of different digital platforms, such as video, audio, gaming and simulations, can support students with

multiple intelligences. The study of Coleman, Cramer, Park, and Bell (2015) highlights how the use of assistive technologies can help learners with physical disabilities to access learning material and complete assignments on the same level as able-bodied peers. Nepo (2017) confirms this reality in his research and emphasises the importance that access to such technologies form part of litigation regarding education of students with disabilities.

A constructivist teaching approach entails teachers to allow a learner a centred learning environment, acting as a monitor rather than a lecturer in the learning process (Williams & Burden, 1997). Bester and Brand (2013) observed that interaction with computer-based technology resulted in learners being able to concentrate on a specific task for a longer time than when receiving instruction orally. Their observation is supported by Harris (2017) who also stated that using technology leads to enhanced problem-solving skills and requires thinking on a higher cognitive level than traditional pen-and-paper activities. Allowing the learner to acquire insight independently by using technology, leads to higher cognition and enhanced learning.

Bester and Brand (2013) also found that no matter what the subject focus, learners show a higher academic achievement when instructed using technology, than without. Learners in their study also reflected higher comprehension scores when reading electronic texts than when using printed versions of the same texts.

However, the findings of Ferrer et al. (2011) which indicate that learners with lower results showed a higher rate of improvement when exposed to computer-based interventions than learners who already have a high cognition, should act as an encouragement for teachers who want to implement intervention strategies to address academic shortcomings in their learners.

2.2.4 ICT integration in STEM subjects

The teaching of Science, Technology, Engineering and Mathematics (STEM) is of global importance, as career opportunities in these disciplines are ever increasing in a technologically driven world (Kennedy & Odell, 2014). Although learners acknowledge

the importance and relevance of such subjects, they are often discouraged by what they perceive as “difficult” content (Osborne, Simon, & Collins, 2003). As practical evidence of their learning is most effective in consolidating learning, computer programmes that assist the user in creating visual and/or virtual presentations of their understanding and therefore increase motivation and self-efficacy, substantiate the integration of digital technologies in these subjects.

One of the benefits of technology is that learners can interact with the world in a virtual setting before physically engaging with it. Donnely, McGarr, and O'Reilly (2011) discuss the value of virtual chemistry laboratories for Science teachers, which only illustrates the value technology integration has in saving costs and workspace, with the advantage of access to limitless samples and examples.

Inquiry focussed learning promotes active learning, which stimulates learners’ critical thinking and problem-solving skills as well as the practical application of the solutions (Hwang, Chiu, & Chen, 2015). Digital platforms that support this type of learning, are online laboratories (De Jong et al., 2014), simulators (Caglar et al., 2015) and robotics (Curto & Moreno, 2016). All three of these platforms allow learners to investigate and apply possible solutions to complex scientific and engineering problems in a safe, controlled environment. Interaction with the software also enables learners to acquire necessary skills for real life situations (Verkuyl, Romaniuk, Atack, & Mastrilli, 2017).

Studies into the functionality of digital technologies in the teaching of Mathematics revealed that authors are divided regarding the benefits thereof. Sinclair and Bruce (2015) mention the value that digital activities have in the branch of geometry, as it enables learners to investigate and virtually manipulate shapes and figures. However, Drijvers (2015) found that the design of both the lessons in which the technology is used, as well as the functionality of the digital program or activity, influences the success of the integration. He underpins the importance that both aspects are coherent, and that the implementation of technology should not be forced if it doesn’t contribute to the context.

2.2.5 ICT integration in language instruction

In comparison to ICT integration in STEM subjects, the focus of implementation regarding language teaching is on skills development, comprehension and, in the case of additional languages, language and vocabulary acquisition (Flores, 2015; Wood, 2010). While it is easier to find programs and applications which address language aspects than Mathematical aspects, it is still important that the technology that is being used compliments that curriculum's objectives (Tang & Zhang, 2013).

Studies have shown that language teachers are strongly motivated to incorporate technology into their lessons (Hilton, 2013; Khanom, 2018). They not only see technology as a tool to express learning, but also as a valuable instrument to enhance communication. Khanom states that "technology provides learners with a communicative learning environment and develops their knowledge from outside textbooks" (2018, p. 33). Flores (2015) also recognises the significance that gamification and the use of social media can have on the confidence and self-efficacy of additional language learners, as both these platforms have a strong focus on interaction and collaboration on the written and oral level.

It is the perspective of Ndebele (2017) that social media platforms such as blogs and wikis can contribute to not only promoting the use of and communication in indigenous languages, but also in the creation of written texts in the language. Wood (2010) similarly found that creating digital texts improves comprehension and stimulates learner participation.

Wood (2010) further identifies the benefits of text-to-speech software in improving learners' spelling awareness, as well as the use of activity-based software in topic writing. The use of audio-visual technology such as podcasts, videos and e-books, is not only beneficial in the unlocking of content, but also as a creative tool to enhance skill development and comprehension (Ali & John, 2019).

The educational value of ICT integration in languages, and specifically in the learning of additional languages, is motivational in the use of computer-based interventions addressing specific curricular content in the subjects.

2.3 Additional language teaching

Numerous studies have been done on the most successful methods when teaching an additional language and have found that comprehension, relevant literature (corpus) and real-life subject matter is of great importance (Taljard, 2012; Rosemary Wildsmith-Cromarty, 2013). The mutual partnership that must exist between teacher and learner is also an important aspect of first additional language learning (Rosemary Wildsmith-Cromarty, 2003). These observations support the notion that effective learning can only take place if there is harmonious interaction between teacher, learner, curriculum content and method of instruction (Tang & Zhang, 2013).

With the roles of the teacher and learner being discussed separately in this literature review, this section focusses on the different branches of additional language teaching, as well as the impact of technology integration in each.

2.3.1 Vocabulary

The importance of vocabulary in the acquisition of an additional language is stressed in many studies. Saengpakdeejit (2014) found that vocabulary could be achieved by numerous means, including guessing the meaning, using a dictionary, accessing media such as songs and films, reading, conversation and picture flashcards. Stoffelsma (2019) similarly expresses the effectivity of printed aids displayed in classrooms, while Almusharraf (2018) perceives the transcription of texts as an effective mode of vocabulary acquisition.

An alternative method of vocabulary accretion is through repetition and rote learning (Stoffelsma, 2019). While this is effective in establishing a personal vocabulary data base, it is important for learners to recognise and understand words in context. Thus, the formation of grammar structures becomes necessary for learners to understand the broader context of the word and to be able to communicate in the additional language.

A statement made by Wilkins in the research of Chester, Stephen, Tosti, and Addison (Wilkins, 1972, as cited in Chester, Stephen, Tosti, and Addison, 2016), that vocabulary and not grammar is imperative for effective communication, was one of the motivating factors that prompted Chester et al. to focus their study on vocabulary acquisition through the use of mobile technology and how it affected student motivation. The results of their study indicated that students' concentration abilities as well as their curiosity, and therefore their motivation, were increased when using mobile technology. These results encouraged the researcher to investigate whether the same outcome could be obtained when computer-based interventions are used in teaching language structures in an additional language.

The input of the learner in the learning process is pertinent in the learning of vocabulary (Almusharraf, 2018). The same principle can be applied when further acquisition of language structures and grammar rules become necessary. The current study is an attempt to enhance learner engagement by making content available to learners to interact with at their own pace through using computers as a teaching platform and thus establishing the feasibility of this medium of instruction.

2.3.2 Grammar and writing

Watson (2015) found that the definition of "grammar" is divergently described by different teachers. Examples of different perceptions were that grammar is the emphasis on language rules or that it was the study of semantics. It is notable that Watson's study showed that although teachers have different perspectives on what grammar is, most did not proclaim a specific notion in the instruction thereof and agreed that grammar teaching is complicated, due to the plethora of terminology. Teachers' assumptions can be alleviated by following Taljard's (2012) advice to scaffold grammar instruction progressively throughout the curriculum.

Watson's study (2015) also underlines that the teaching of grammar in an additional language drastically contributes to learners' writing development. This inference is supported by the work of Frodesen (2018), who stated that focus on grammar teaching

can improve learners' comprehension ability to create a wide range of contextual resources.

Creative and functional writing are often practical implementations of grammatical concepts and therefore a reflection of learners' understanding of the content. In response to grammatical structures contributing to writing skills, the creation of written texts also improves language acquisition (Zheng & Warschauer, 2017).

In a technologically dominated world, learners are consistently exposed to digital platforms with which they can create their writing. Often learners do not even realise that the texts that they create, are connected to language learning (Zheng & Warschauer, 2017). A benefit of the use of technology in the creation of written texts, is the ability of learners to collaborate on assignments, using platforms such as Google Docs or similar cloud-based technology. As peer interaction is a valuable aspect in learning (Mazur, 1997), this contributes to learner motivation and a higher probability of language learning.

2.3.3 Reading, listening and speaking

Literacy is generally described as a person's ability to read and to make sense of what they are reading. According to the Progress in International Reading Literacy Study (PIRLS) 2016 statistics (Howie et al., 2016), reveal that 78% of South African Gr 4 learners are unable to read with comprehension. However, the statistics regarding specific languages showed focused concern, with between 82.4% (Sesotho) and 93.3% (Setswana) learners not being able to read in vernacular languages. Afrikaans and English showed better results in that respectively 55,9% and 56.9% did not reach the lowest benchmark. An inference that can be drawn from these results is that although much needs to be done to improve reading comprehension in general, focus should also be placed on languages that are often not taught as the language of instruction.

The ability to draw conclusions and create meaning by reading texts has an impact on all aspects of academic life (McBride, 2019). Even with the vast availability of audio-visual materials, written texts remain the main vehicle of information distribution in learning. With regards to additional language acquisition, reading also contributes to comprehension

development as well as vocabulary acquisition (Jeon & Yamashita, 2014; Saengpakdeejit, 2014). Formal instruction in reading skills is therefore a crucial part of a language teacher's role.

Floris and Renandya (2017) place further emphasis on the importance of an adequate listening and reading comprehension in the acquisition of and confidence in all other language aspects, such as spelling, grammar, writing and speaking. While reading provides the learner with visual input, listening is the vehicle for auditive input. Before we were able to read, we listened for information. Similarly, listening is the first method of learning for additional language learners when they are initially exposed to the language (Vandergrift & Baker, 2015). Goh (2018) proposes that by guiding learners to reflect upon their perceived understanding when listening for information in an additional language, metacognition takes place and learners build on their existing vocabulary and comprehension in the subject.

As mentioned earlier, Taljard (2012) is supportive of the scaffolding of additional language learning according to ability. However, the absence of adequate reading and listening texts in South African vernacular languages on additional language level is evident, especially aimed at younger learners. Taljard also regards the lack of frequent practical application of the additional language as detrimental in the learning process. Eizi and Talaei (2019) mention that learner interchange is a valuable part of the learning process, as students would often put their best foot forward when trying to explain a concept to peers. It is interesting that in a study by Van der Walt (2009), additional language learners commented that they prefer teachers to use the language that is being taught not only in the instructional process, but also in informal interactions inside and outside the classroom, as it forces them to recall vocabulary and cognition and contributes to higher achievement. It is therefore important for teachers to focus on using the additional language in class discussions as well as on social media platforms, to encourage comprehension and confidence.

2.4 Learner motivation

Studies have shown that learners who have a strong motivation towards learning an additional language show greater efficiency in their learning (Ger & Bahar, 2018; Jafari, 2013; Lasagabaster, 2011; Suryasa, Prayoga, & Werdistira, 2017). Jafari states that it is possible that lesser abled learners with a higher motivation can perform better than so-called “clever” peers who lack motivation and that motivation is therefore the deciding factor in learning an additional language.

While authors such as Ger and Bahar (2018) cite learners’ perceptions towards their school as a factor determining motivation, others believe that teachers are responsible for raising motivation levels in students (Almusharraf, 2018; Moskovsky, Alrabai, Paolini, & Ratcheva, 2013). Shevatekarshradavasant’s finding that a relationship exists where family environment is influential to motivation was mentioned by Jafari (Shevatekarshradavasant, 2012, as cited in Jafari, 2013) and this is similarly noted by Condy and Blease (2014).

In a study by Lasagabaster and Huguet (2007) it was found that motivation is influenced by age and that younger learners often have a higher level of motivation. The researcher therefore aimed the current study at pre-high school learners to identify the viability of computer-based interventions to raise their level of motivation to learn language structures earlier, so that, when they move on to more complex comprehensive, oral and written assignments in high school, they will be assisted by a stronger grammatical foundation.

The existence of such a plethora of factors contributing to learner motivation required deeper investigation from the researcher to better understand measures that could increase motivation in the application of computer-based interventions and the viability of these in Afrikaans FAL teaching.

2.4.1 Academic achievement

Moskovsky et al. (2013) underpin academic achievement as a sustaining factor in learner motivation and recognised the effect of motivation on second language acquisition, by

stating “it is widely accepted that, everything else being equal, more motivated learners would be more successful at learning the second/foreign language than less motivated learners, and that without sufficient motivation even highly competent and cognitively capable individuals may be unable to accomplish long-term goals” (p. 35).

This is supported by Didion, Gesel, Martinez-Lincoln, and Leonard (2017), who commented that motivation plays an important role in conquering academic barriers and explored the potential of motivational training in intervention frameworks to assist learners in improving intrinsic motivation.

Lasagabaster (2011) is another researcher who recognises the interaction between academic progress and intrinsic motivation. His comment that progress improves motivation while motivation in turn increases progress, leads the researcher to believe that teachers need to design learning experiences which would intensify learner motivation in order to ensure academic progress.

2.4.2 Feedback

Feedback is important in any educational setting, but especially in intervention strategies, as it elevates learner’s consciousness of their strengths and the areas in which they need to improve (McKelvie & Jordan, 2018). The link between feedback and motivation is recognised by researchers such as Burgers, Eden, van Engelenburg, and Buningh (2015) and Marthouret and Sigvardsson (2016). Burgers et al. (2015) noted that the effects of feedback would be determined by the way in which it is delivered, as well as the learner’s perception of the feedback.

Feedback can be delivered verbally or non-verbally. Burgers et al. (2015) found that there is no substantial difference between the level of altered learning behaviour when written feedback (non-verbal) is either short or elobarate. However, they found that when explanatory feedback is given verbally, a significant improvement in learning behaviour is evident. They attritubed this to the intention of simple feedback being to encourage the learner to continue or to review their answer, while explanatory feedback focusses on specific elements and how it can be altered or how it contributes to higher understanding.

Abbasian and Bahmani (2014) also analysed the results of corrective feedback and found that it improves the learner's language ability. These findings indicate that both verbal and non-verbal, as well as simple and elaborate feedback should be given constantly thougout interventions in order to sustain positive learner motivation.

Burgers et al. (2015) also studied the effects of negative versus positive feedback and found that while positive feedback results in higher motivation, negative – or corrective – feedback has the biggest impact on altered learning behaviour and is therefore necessary in intervention strategies. Kampkuiper (2015) noted that negative feedback can also contribute to motivation, depending on it being timely and constructive.

Al-Faki and Siddiek (2013) mention that a lack of timely feedback and resulting intervention gives rise to the settling of incorrect language application. Marthouret and Sigvardsson (2016) identify the time consumption of feedback as a possible reason for the lack thereof. Feedback gives rise to timely interventions and is therefore imperative to enhance corrective measures. Abbasian and Bahmani (2014) found that there is no significant improvement in learners' efforts when feedback is given either prospectively or retrospectively. Marthouret and Sigvardsson (2016) reported that immediate feedback takes less time than retrospective feedback and results in immediate revision. This leads the researcher to speculate that immediate feedback would have an instant effect on learners' input and thus improve motivation.

According to the Cambridge Dictionary, self-efficacy translates to an individual's confidence that they can achieve an undertaking successfully (Cambridge Dictionary, 2019). Nasrollahi and Barjasteh (2013) express the necessity of self-efficacy in the motivation of learning an additional language, which leads the researcher to believe that feedback plays an important role in establishing learner motivation.

2.4.3 Different learning styles

Kampkuiper (2015) found that feedback not only improves self-efficacy, but also encourages trust between teacher and learner. The relationship between the teacher and the learner has strong repercussions in learner motivation, but also vice versa. In both

the studies of (Shen et al., 2015) and (Hagenauer, Hascher, & Volet, 2015) the authors make mention of the effects that learner motivation has on teacher motivation.

How to manage this relationship so that motivation is positive for both parties? According to Tang and Zhang (2013), teachers should apply their focus on creating harmony in a student-led classroom, encouraging learners to interact with content independently and exploratively. Almusharraf (2018) also mentions the importance that teacher motivation and teaching style in the acquisition of a second language has on learner motivation. Language learning is less successful in teacher-dominated classrooms where learner interaction is limited (Almusharraf, 2018). It can therefore be concluded that educators' teaching styles and how they conduct their classrooms, have a strong impact on their own motivation and therefore on the motivation of their learners.

Gardner (2000) proposed that there are nine modalities in which intelligence can be distinguished and according to which learning styles should relate. These learning intelligences are musical-rhythmic, visual-spatial, verbal-linguistic, logical-mathematical, bodily-kinaesthetic, interpersonal, intrapersonal, naturalistic and existential. According to Ghaedi and Jam (2014) additional language learners often have a low motivation, but this can be improved by teachers supplying learners with activities that are focussed on various learning styles and addressing different intelligences.

Lasagabaster (2011) mentions that a decline in motivation in older learners in European schools can be found in the change in teaching approach. In younger learners, acquiring an additional language is often oral-based, while teaching in higher grades becomes more focussed on grammar and vocabulary, and thus more focussed on the teacher's methodology. As South African schools follow a similar teaching model to that investigated by Lasagabaster, it is important to find ways in which grammar and vocabulary can also be acquired through innovative learning methods and even self-study via computer-based methods such as e-learning.

In reaction to Lasagabaster's recommendation that "since many teachers complain that they have to confront classes of students who find lessons boring and unchallenging,

surely more research is needed here" (Lasagabaster, 2011, pp. 4-5), the focus of this study was aimed at contributing to literature regarding alternative teaching methods and incorporating different learning styles, with the aim of increasing learner motivation and satisfaction. By using computer-based interventions, the role of the teacher as the conveyor of the content is limited and learner interaction is encouraged.

2.5 The responsibility of the teacher

The traditional role of the teacher as lecturer and principal conveyor of content has been greatly altered with the rise of 21st century learning (Tang & Zhang, 2013). With the focus on acquiring ever-increasing core competencies such as collaboration, digital literacy, critical thinking and problem-solving (Van Laar et al., 2017), learners' expectations are that teachers construct an interactive learning environment in which these core skills can be honed. As stated by Tang & Zhang, "teachers are supposed to be the organizers and assistants of classroom activities but not the keynote speakers; the researchers of classroom teaching but not the executors; the designers of future lives but not the instructors of knowledge acquisition" (2013, p. 1809).

While the teacher's mantle is not that of lecturer anymore, he still needs to manage the "what", "how", "when" and "who" of the learning environment (Tang & Zhang, 2013). As discussed in the previous section, creating a student-lead environment where learners experience a safe place to learn with confidence, is one of a teacher's responsibilities (Almusharraf, 2018). As peer-instruction is an important aspect of learning (Mazur, 1997), teachers should also include opportunities for collaborative learning.

As a monitor of the learning experience, a huge part of the teacher's preparation will therefore go into the creation of learning content and the vessels in which this content can be offered to the learners in a student-led setting.

2.5.1 Creation of content

As the learning of an additional language is a requirement to qualify for the South African National Senior Certificate (DoE, 2010), provision is made for adequate learning material.

However, these materials should be used in collaboration with other resources in a student-centred learning environment to ensure maximum results (Harris, 2017).

Whereas plenty of written resources for both academic and recreational purposes exist in English and Afrikaans, researchers such as Rosemary Wildsmith-Cromarty (2003) and Ndebele (2017) express the need for corpus in other African languages. Authors also recognise the need for digital resources in almost all of the indigenous languages (Ndebele, 2017; Prinsloo & De Schryver, 2001; Taljard, 2012; Rosemary Wildsmith-Cromarty, 2013). Prinsloo and De Schryver (2001) aired their opinion that in the digital milieu of the present, it is important for African languages to establish electronic corpora and literature in order to compare sufficiently with developed countries.

Ndebele (2017) conducted a study to determine the value of social software such as blogs and wikis in the teaching and development of African languages. He concluded that language teachers should improve their technology programming skills to be able to create digital content that promotes learning in these additional languages.

With this shortage of material in mind, teachers have the responsibility to create or adapt their own content. The advantage of this is that content can be truly study-centred and teachers can focus on differentiation, as they will design content that correlates with the curriculum, yet keeping the learners' unique needs and abilities in mind (Anderson, 2016).

Another reason for teachers to feel obligated to create their own content, is when the need for interventions arise. Formative intervention strategies form a linear development to address specific content that was not sufficiently assimilated in the original unlocking thereof (Engeström, 2011). Fraser and Galinsky (2010) explains that the success of an intervention relies on the design and development thereof.

2.5.2 Curriculum and content design

An unchanging role of the teacher is that of curriculum and content designer. It is mentioned by Tang and Zhang (2013) that although teaching materials have evolved and

must be taken into consideration when designing learning experiences, the syllabus and course objectives should always be considered.

Designing effective interventions requires interweaving of teaching techniques, subject content and skills (Koehler & Mishra, 2009). The use of technology in this mixture intensifies the need for careful planning of the design. Tang and Zhang (2013) clarify that teachers need to be aware that the use of technology should not dominate the curriculum content, but rather contribute to the unlocking thereof.

It is proposed that teachers should make use of the TPCK model of Mishra and Koehler (2006) when designing educational interventions, especially when integrating technology. This model is comprised of the integration of technological (T), pedagogical (P) and content knowledge (CK) in the design of learning activities. The implication of the integration in this model is that although deep learning takes place when content knowledge is presented using pedagogically sound teaching methods, further deepening is achieved with the integration of technological aspects as well.

In the incorporation of technology into the TPCK model, it is important to establish how the use of technology can magnify the rendering of curriculum content and what effect it will have on the learners' assimilation of the content. It then also needs to be determined whether the incorporation of technology matches the teaching procedures in the presentation of the content (Blackwell, Lauricella, & Wartella, 2016).

The functionality of the TPCK model has been acknowledged in numerous studies. Blackwell et al. (2016) reported how the use of this model assisted the participants in their study to identify the impact that factors such as learners' age, economic income of the parents and teachers' technology acceptance and competency have on the implementation of tablet technology. Dalal, Archambault, and Shelton (2017) observed that teachers in their study reported improved academic achievement in their learners after they started using the model in their decision making regarding the structure of interventions.

In support of the TPCK model, Maddux and Cummings (1999) also emphasise the importance in choosing the correct technology tool to teach specific content. It is therefore the responsibility of teachers to review their technology acceptance and empower themselves digitally in order to utilise technology to enhance the teaching process.

2.5.3 Technology acceptance

Greener and Wakefield (2015) mention that the attitudes, teaching beliefs and confidence that teachers have towards technology, are the main drives behind effective technology implementation. To illustrate this, they mention the findings of Ertmer and Ottenbreit-Leftwich (2010) in that, in order to make 21st century teaching a reality, teachers need to adapt their knowledge, beliefs and teaching culture.

Authors such as Donnely et al. (2011) as well as Mama and Hennessy (2013) focussed their studies on teachers' perspectives regarding the role of technology in general and in their classroom practice. In both studies, evidence was found to support Ward and Parr (2010) in their findings that some teachers prefer the traditional approach to teaching and see technology as a threat that will replace teachers. They did, however, also comment on the willingness of teachers who recognise the value of technology, to make the shift from being educators, to being facilitators and therefore applying the constructivist approach to their teaching. Maré and Mihai (2018) also identified that teachers will apply technology more readily if they realise the benefit of it to their learners.

In their research, Donnely et al. (2011) recognised four main types of teacher integration. These typologies are a) the contended traditionalist who uses very little technology in their own teaching, b) the selective adopter, who would only adopt the use of specific technologies if they recognise that it will ultimately improve their students' marks, c) the inadvertent user, who would use technology almost because they are forced to and not necessarily taking ownership of their pedagogy in this, and finally there is d) the creative adapter, who uses technology in a student-centred way, recognising the value of it in their students' learning and finding ways to implement the best technologies for the best purposes. Donnely et al. (2011) Donnely et al. (2011) also commented on the complexity

of some technologies and the need for teachers to receive proper training in order to implement these effectively.

This links closely with the SAMR model as suggested by Puentedura (2010), where the objective of the implementation of technology is to substitute, augment, modify and redefine activities with the use of technology. In the current study, activities for learners who mainly used technology to acquire the additional language, were designed on all four levels of the model to best investigate the effects of technology on learning and therefore the advantages and disadvantages of this method.

It is therefore important to note that for teachers to integrate technology into their teaching practice, they need to be convinced that it is beneficial. As stated by Ifenthaler and Schweinbenz (2013), “the promised benefits of this technology can be realized in a school environment depends whether teachers will accept this technology and integrate it into classroom practice” (p. 532).

2.6 Conceptual framework

2.6.1 Introduction

The focus of the intervention was to establish the viability of using computer-based interventions in the teaching of an academic subject, namely Afrikaans FAL. As there is no single framework to sufficiently analyse both the effectiveness of the computer-based activities, as well as the degree to which different cognitive skills are being addressed in the curriculum learning objectives, the researcher chose to apply two separate frameworks to the study.

The two frameworks that guided decision-making throughout the study, were the SAMR model (Puentedura, 2010) and Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths and Wittrock’s revised version of Bloom’s taxonomy (2001). While the SAMR model assisted in evaluating the implementation of the technology, the cognitive skills required in the learning objectives of the Afrikaans tasks were evaluated through Bloom’s taxonomy.

2.6.2 SAMR Model

The ever-changing nature of digital technology as well as its unpredictability, contributes to teachers not always understanding the software or devices. This poses a challenge when deciding how and when it will be best to incorporate this technology into their teaching (Koehler & Mishra, 2008). To assist teachers in making decisions in designing activities during technology incorporation, Puentedura (2010) designed a model to illustrate four different levels of technology integration.

The model consists of a laddered approach which guides teachers not only in choosing an appropriate technology to achieve the outcomes for a specific lesson, but also in evaluating possible technologies for an elevated intensity of teaching and learning. The model was named SAMR, after the four levels of implementation, namely Substitution, Augmentation, Modification and Redefinition.

Each of the levels illustrates a more advanced application of technology. Furthermore, different levels of learning experiences are reached through progressing through the tiers. Puentedura's (2010) explanation of the different levels in the model give a clearer understanding of how progression takes place. While the Substitution and Augmentation focus on enhancement of learning, Modification and Redefinition leads to the transformation of learning (Schrock, 2013).

At the Substitution level, technology is basically used as a direct replacement for older technology. An activity that could formerly have been done with pen and paper, can now be done in the same way, replacing the pen and paper with the device. Although this method can be useful and have an element of fun, it will not necessarily enhance the learning outcome, as no significant difference in cognitive skills are expected (Puentedura, 2010).

At Augmentation level, technology is used to improve the functionality of the activity slightly. Although the activity itself stays more or less the same as it was in the past, the addition of technological aspects enhances the learning. Using Puentedura's (2010) model, Schrock (2013) gives examples of how to achieve activities at Augmentation level,

such as adding a video clip to illustrate a process, using e-readers instead of printed books, or listening to a poem that was set to music, instead of just reading the text. Incorporating these technologies, the learning experience will start to be slightly enhanced, which will contribute to achieving a more satisfactory learning outcome.

The next level, Modification, is the first in which learning starts to be transformed. Although the focus of the task does not change, the addition of technology allows it to be redesigned in such a way that goals that could not previously be reached, are now within the grasp of the learners specifically because they have access to certain computer technologies (Puentedura, 2010). An example of this implementation might be for learners to create a spreadsheet on Excel documenting previously collected data. Significant improvement of student learning can be observed on this level.

Redefinition is the highest level of technology implementation, in which computer technology is used to create tasks that have not been possible to do previously and cannot be completed without the use of the technology. This means that tasks can be designed to accomplish learning on a pedagogical level that could not be achieved before. Examples of tasks on the Redefinition level is the creation of e-books, infographics and other digital artefacts to reflect learner comprehension (Schrock, 2013).

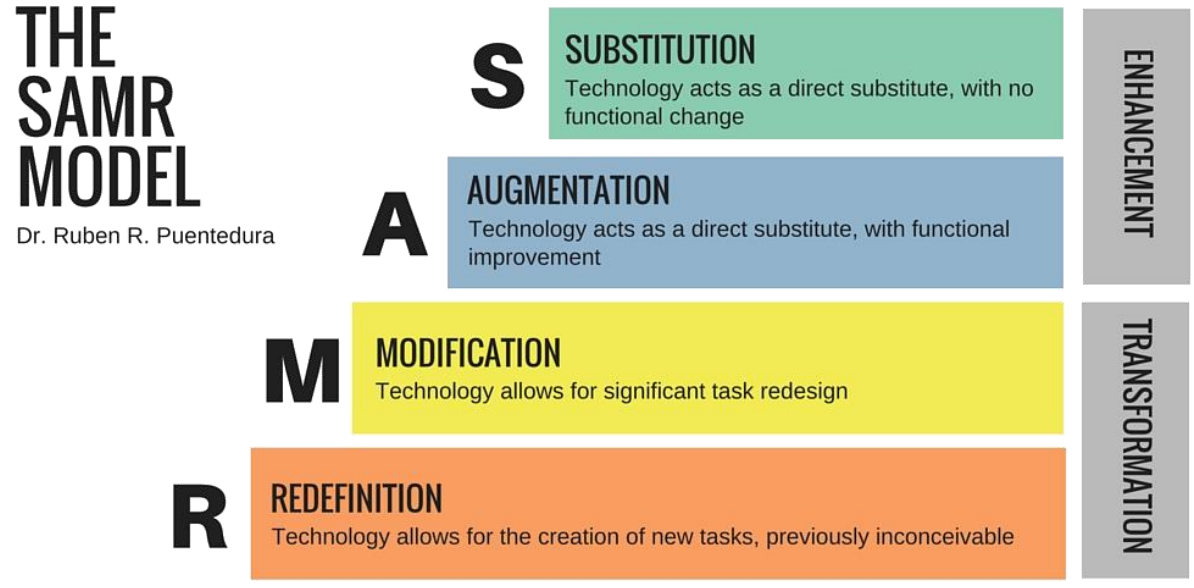

Figure 2.1 The SAMR model as proposed by Puentedura (2010)

Puentedura (2010) emphasises the necessity of teachers to aim to improve their teaching by progressing through all four levels of integration, to not only enhance learning, but also to transform the learning experience.

2.6.3 Bloom's Revised Taxonomy

Different processes contribute to learning in the cognitive domain. Dr Benjamin Bloom chaired a committee of educators in 1956, which led to the development of a taxonomy which describes the developmental order of cognitive skills needed to enhance learning (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956). Each of the skills require a higher order of thinking and are all interlinked, in that a learner cannot progress to the next level without having mastered the previous level.

Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths and Wittrock (2001) revised the taxonomy to clarify the processes. They changed the order of the processes slightly, but most notably used verbs to describe the different cognitive levels. By using verbs to describe these levels, the teacher is able to easier link the processes to intended learning outcomes and state clearly what is expected of the learners, as "objectives that describe intended learning outcomes as the result of instruction are usually framed in terms of (a) some subject matter content and (b) a description of what is to be done with or to that content" (Krathwohl, 2002, p. 213).

The revised taxonomy organizes the processes in the following order, ranging from low to high:

- Remember
- Understand
- Apply
- Analyse
- Evaluate
- Create

The authors of Bloom's Revised Taxonomy also provided additional keywords in the form of supplementing verbs which further expand the scope of skills that learners need to achieve to meet the learning outcomes of the task (Krathwohl, 2002). The revised taxonomy with the appropriate keywords is illustrated in Figure 2.2:

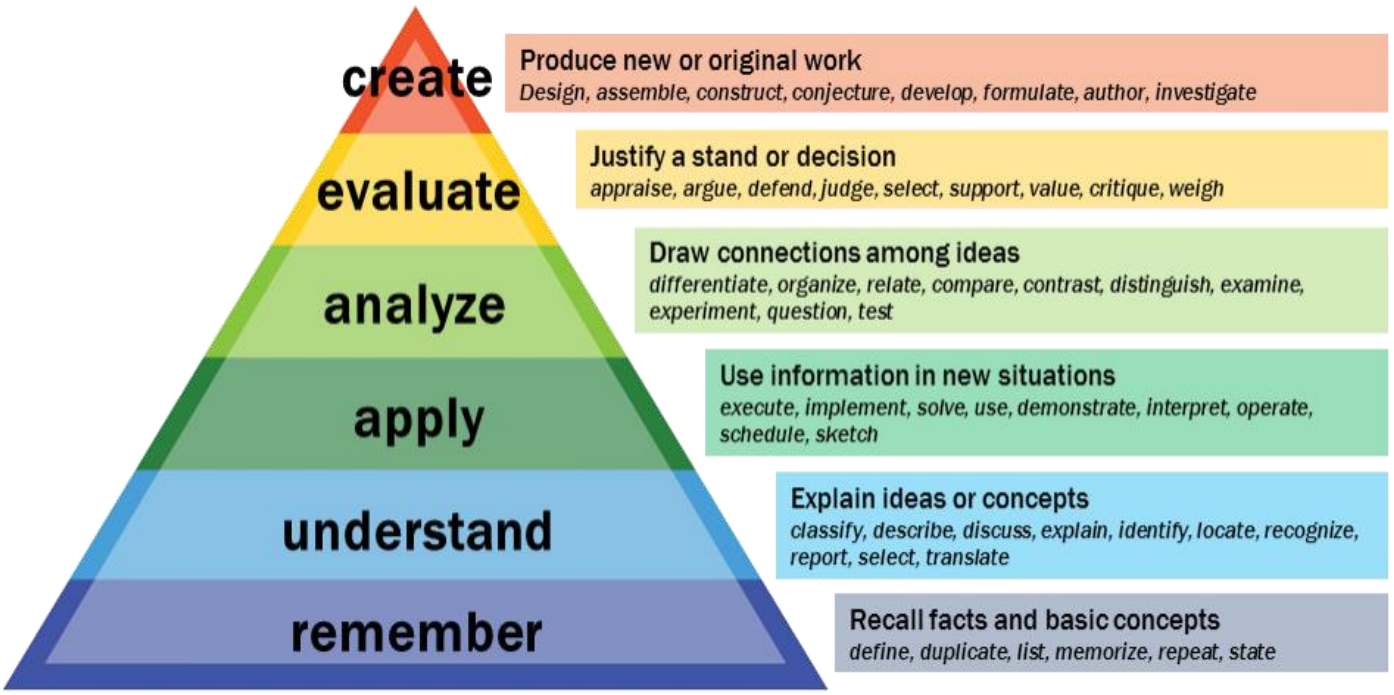

Figure 2.2 Bloom's Revised Taxonomy

2.6.4 Integration of SAMR Model and Bloom's Revised Taxonomy

In integrating the SAMR Model and Bloom's Revised Taxonomy, both Puentedura (2010) and Schrock (2013) proposed that the different levels of both models are reflective of each other in that the lower levels of the SAMR model addresses the lower levels of Bloom's Revised Taxonomy, while higher levels reflect each other similarly.

Figure 2.3 illustrates this parallel integration of the SAMR model and Bloom's Revised Taxonomy as suggested by Puentedura (2010). According to this suggestion, the Remembering level of Bloom's Revised taxonomy will only be compatible with the Substitution level of the SAMR model, while the Create level of Bloom's Revised Taxonomy will only be reflected in the Redefinition level of the SAMR model. The arrows

in the figure indicate which levels are compatible with each other, according to Puentedura's suggestion.

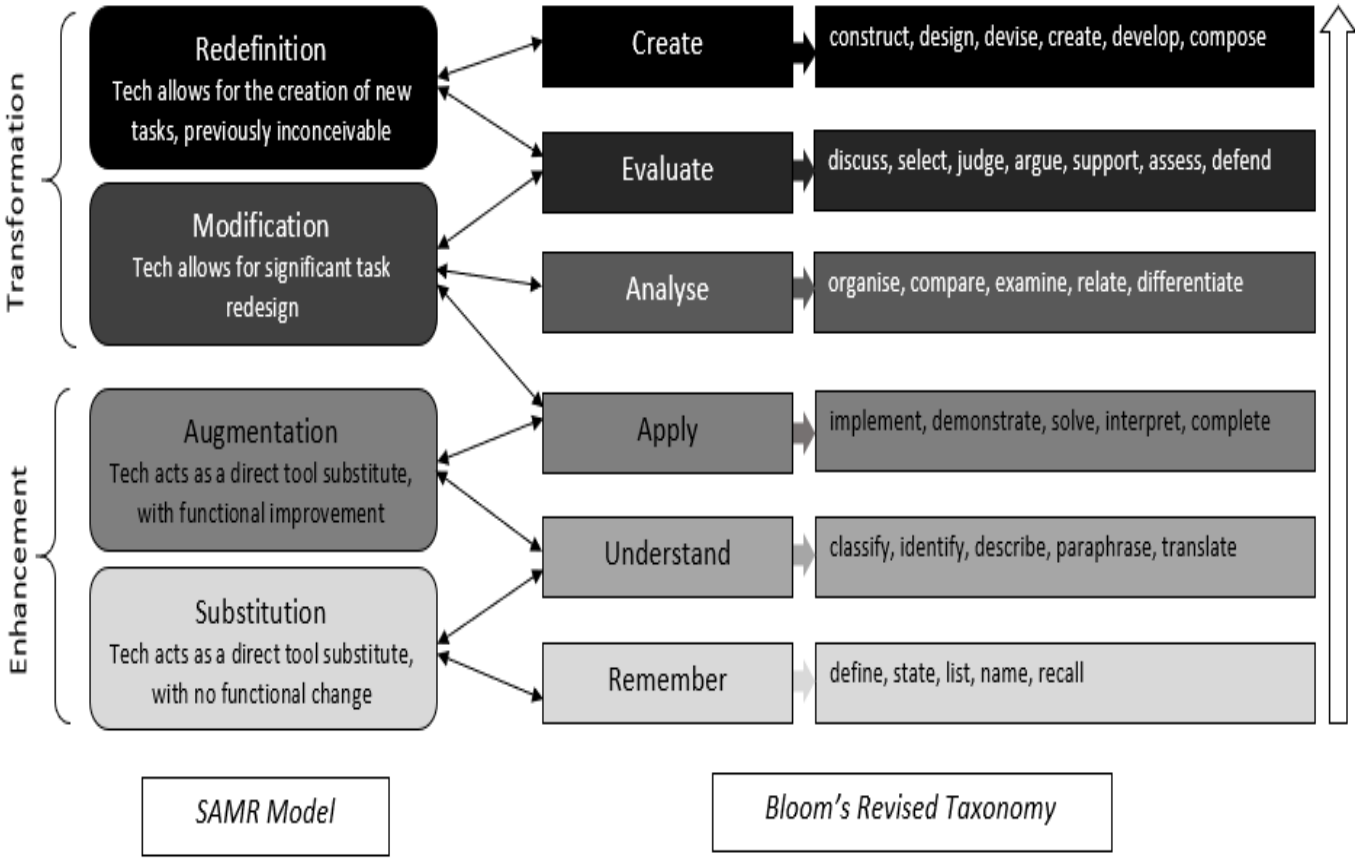

Figure 2.3 Integration of SAMR and Bloom's Revised Taxonomy

However, it is the researcher's experience that although this method of integration is true most of the time, there are certain instances where lower levels on Bloom's Revised Taxonomy can be integrated with higher levels of the SAMR model and vice versa. An example of this exception is the second activity of the intervention, in which the language concepts are unpacked, explained and reinforced, which places focus on two lower levels of Bloom's, namely Understand and Remember. The technological design of the activities is however on a higher level of the SAMR model, namely Redefinition, since methods that could not be used previously without the use of technology, are being implemented in the presentation of the activities.

A detailed unpacking of activities of the intervention and the related levels of the SAMR model and Bloom's Revised Taxonomy can be seen in Table 2.1.

Table 2.1 Integration of SAMR and Bloom's Revised Taxonomy within the intervention

Activity number	Description	SAMR	Bloom's Levels
1	Online multiple-choice quiz that determines current knowledge and understanding of Direct and Indirect speech.	Substitution	Remember
2	Self-guided e-learning course, consisting of audio-visual resources (video, audio and graphics) that unpack and explain the concepts of Direct and Indirect speech. Each mini lesson is reinforced by a quiz (multiple-choice and filling in), evaluating the learners on their understanding of the presented content.	Redefinition	Understand Apply Evaluate
3	Video of an interview integrated with a quiz in which sentences from the interview are analysed with regards to changing between Direct and Indirect Speech.	Modification	Analyse

Activity number	Description	SAMR	Bloom's Levels
4	Application of acquired knowledge of Indirect speech by completing an Excel spreadsheet. The hidden formulas allow learners to see immediately whether knowledge is being applied correctly or if reviewing of e-learning course is necessary.	Augmentation	Apply
5	a) Creating a comic strip to show understanding of Direct speech using speech bubbles. b) Transcribing the comic strip to Indirect speech using quotation marks. c) Communication: Video-recording the transcribed Indirect speech as a television news report.	Redefinition	Create Analyse

2.7 Concept clarification

First Additional Language (FAL) refers to a second official language that learners in South African schools need to comply with to achieve a National Senior Certificate. Although this is not the language of instruction, proficiency must be on a level that reflects basic skills to communicate socially as well as academically across the curriculum (DoE, 2013b).

ICT refers to Information and Communication Technology.

Computer-based tasks refers to activities which primarily focus on learners using computers in the execution of the task.

Interventions are strategies that are designed with the purpose to change or improve the circumstances or outcomes in a specific situation (Fraser & Galinsky, 2010).

Computer-based interventions combines the previous two concepts, in that interventions with the purpose of improving the outcomes of situations, are executed in the form of a structured set of computer-based tasks.

Complex language structures refer to the intricate way in which different parts of language, such as tenses, grammar and meaning, are combined and applied to create significant comprehension and communication in the language.

E-learning refers to using electronic equipment such as computers and the Internet to access and learn curriculum content (Arkorful & Abaidoo, 2015).

Curriculum content refers to the specific content required in a subject in order for learners to meet necessary standards in further grades (DoE, 2013a).

2.8 Conclusion

By reflecting upon previous research regarding technology integration, learner motivation and additional language teaching and how these aspects relate to each other, the researcher resolved that investigations into technology application to teaching additional language is not abundant. In consolidating all the elements that were discussed in this literature review, the researcher aimed to establish whether the use of computer-based interventions in teaching Afrikaans FAL could alleviate the challenges that both Afrikaans FAL teachers and learners experience in relating to the motivational and academic aspects of the language.

It was necessary for the researcher to keep the required learning outcomes and cognitive skills in mind when choosing and designing a specific computer-based task in the intervention. To achieve this, the SAMR model and Bloom's Revised Taxonomy was used as a conceptual framework to guide the process of decision making in the intervention research.

Chapter 3: Research design and methods

3.1 Introduction

The research design and methods of the study were carefully established in order to best guide the researcher in conducting a sound, unbiased study to determine the viability of computer-based interventions in Afrikaans FAL teaching.

The aim with this chapter is to demonstrate the relevance and purpose beyond implemented philosophies and designs and carefully explains the methodology of the study. It focusses on the role of the participants as well as data collection strategies and data analyses. Finally, methodological norms are discussed as with regards to credibility, transferability, dependability and confirmability, as well as ethical considerations.

3.2 Philosophy

In order to establish a philosophical foundation for the study, one must look at the research problem. Rising from the need for alternative teaching methods in which to address the challenges regarding motivation, time constraints and necessary content to be covered in Afrikaans FAL, the purpose of the study was to establish the viability of the use of computer-based interventions. The purpose of this intervention is reflected in the philosophy of pragmatism. Support for this notion lies in the research of Creswell and Creswell (2017) in which they describe the nature of pragmatism as that of researchers seeking possible practical solutions by investigating the root of the research problem and considering all available solutions to understanding the problem.

Pragmatism has its origins in the 1870s, combining the ideas of various philosophers, such as John Dewey, Charles Peirce, George Mead and William James (Creswell & Creswell, 2017). The pragmatist viewpoint is that learning should be practical in the contexts of place, time and circumstance and that learners should experience learning through hands-on experience, experimenting and problem-solving (Greenberg & LoBianco, 2018). This closely relates to the theory of constructivism, which also states that people learn through experiencing and reflecting upon these experiences. This

strongly supports the current study, as the intervention and successive interviews closely investigated the perspective of the participants after their interaction with the intervention.

It is futile to ignore the impact of technology and the interaction that 21st century learners have with the digital world within their learning. John Dewey stated that "if we teach today's students as we taught yesterday's, we rob them of tomorrow" (Dewey, 1944, p. 167). Considering this statement, one has to acknowledge that studies done to verify the viability of the use of modern technology in a 21st century learning environment, are of a pragmatic nature, as learners can interact with and learn from a limitless world of knowledge at their fingertips (Chen, Liu, Cheng, & Huang, 2017).

Support for the application of pragmatism to qualitative research and specifically intervention research, was drawn from research conducted by Morgan (2014) in which he focused on both the practical and the inquiry aspects of social research. He explains the ontology of pragmatism as a search for “what works” rather than one specific truth, while the epistemology of the philosophy establishes that many viewpoints may be accepted in reconciling different perspectives.

A statement by Gutek (2013) that pragmatism also holds with the idea that philosophical perspectives depend upon the practicality of its implementation and the success thereof, reflects the scope of this intervention research, in that the intervention was aimed at a practical solution to make learning available for learners to access at any time and place, while engaging with the content.

3.3 Methodology

In determining the effects of an intervention, one would often rely on quantitative evidence, as reflected in the research of Jung, McMaster, and delMas (2017). However, the purpose of this study was to determine the viability of using computer-based interventions in teaching Afrikaans FAL and therefore the experiences of the participants toward the content of and vehicle in which the intervention was presented, needed to be investigated.

McMillan and Schumacher (2014) stipulate that the focus of qualitative research lies within the perspective of participants rather than measured outcomes. In light of this, an exploratory qualitative research approach was followed. Maree explains that exploratory research aims to gain greater understanding of a phenomena through interaction (2016). Observing the interaction of the participants with the intervention was of great importance in the study, as they were only able to form their own perceptions of the viability of computer-based interventions in Afrikaans FAL through intensive engagement with the activities. It was the role of the researcher to interact with the participants through group interviews in order to establish emerging patterns to support her findings.

The inductive nature of qualitative research means that inference must be made from a range of different data collection strategies (Maree, 2016). McMillan and Schumacher (2014) also support the notion that various forms of inquiry should be followed during qualitative research. To establish the viability of using computers as a method of instructing Afrikaans FAL, the researcher made use of various data collection tools to better understand different participants' experiences of the intervention. Inferences were made through inductive reasoning by analysing and coding the data to identify emerging themes, guiding the researcher to objective findings regarding the viability of computer-based interventions in Afrikaans FAL teaching.

3.4 Research design

As the study centres on improving existing circumstances and developing skills in Afrikaans FAL, an intervention-based case study was conducted. According to Fraser and Galinsky (2010), interventions are steps or processes that are deliberately implemented to change attitudes and behaviour and that intervention research is the study of these processes. Pressley, Graham, and Harris (2006) noted that intervention research in education focusses on expanding academic achievement. The aim of the current study was to establish the viability of computer-based interventions to improve the cognition, motivation and ultimately the academic achievement of Afrikaans FAL learners.

With intervention research mostly used in scientific fields such as medicine and agriculture, it is important to note that the approach of educational intervention research

will differ from the traditional methods. While the expected approach is to apply the intervention to a random experimental sample with the same preconditions as the control group, educational interventionists already know which attitudes and actions of the control group need to be changed, and focus on designing the intervention with the desired outcome in mind (Engeström, 2011).

During this study, computer-based interventions were introduced to participants who experience different levels of cognition in Afrikaans FAL. As one of the problems giving rise to the study was the issue in consolidating available time and prescribed content when teaching Afrikaans FAL, the viability of using computer-based interventions as a possible solution to this complication, and therefore making learning available at any time and place, needed to be established.

To determine whether participants experienced any notable change in their cognition by being subjected to the intervention, it was necessary to obtain pre-intervention as well as post-intervention data from them. To establish the merit of the intervention, it was important to compare the observations of the participants to their understanding of the language concepts and experiences in learning with computers before and after completing the intervention, as well as during their engagement with it.

Pre- and post-surveys in the form of questionnaires, as well as semi-structured interviews were used to gather data directly from respondents.

3.5 Participants

The participants in the study were Gr 7 Afrikaans FAL learners in an affluent private school setting. The group consisted of 57 learners who were heterogenic according to home language, gender, race and academic strengths and intelligences. These learners had made the choice to continue with Afrikaans FAL until matric level and were therefore expected to have a reasonable positivity in their attitude towards Afrikaans FAL.

All learners have been exposed to Microsoft software as well as the use of the Internet and educational web-based applications during ICT periods at school.

Educational intervention research should be beneficial to all learners in a population (Meyer & Ray, 2017). To ensure that all Afrikaans FAL learners have equal opportunity to benefit from additional exposure in learning the specific complex language structures, all learners in the group received the intervention. However, nineteen participants indicated that they would volunteer to take part in semi-structured group interviews after the completion of the intervention. These learners were divided into smaller groups using a stratified purposive sampling method.

The variation of participants in the stratified sampling groups were based upon a) learners who struggled in Afrikaans FAL and whose parents specifically requested the school to supply their children with additional assistance in Afrikaans FAL, b) learners who speak Afrikaans as a mother tongue and therefore desired enrichment in certain aspects of FAL and c) learners who neither struggle nor necessarily excel in Afrikaans but would like to improve their understanding of the subject. A fourth group consisted of respondents from each stratus.

All members and parents of the larger population were briefed on the purpose and process of the study. Convenience sampling was used within the stratified sampling method, as learners and parents volunteered to be part of the semi-structured interviews.

3.6 Data collection strategies

Different types of data collection were used during a three-week period in October and November 2018. Participants completed pre- and post-intervention questionnaires, participated in the intervention and were interviewed in small groups. Data collection took place on-site, during Afrikaans FAL lessons or at times that were convenient to the participants and researcher.

3.6.1 Survey questionnaires

Although questionnaires are mostly used in quantitative research, McMillan and Schumacher's description that "the subject responds to written questions to elicit reactions, beliefs, and attitudes" (2014, p.46) reflects the usefulness of this data collection strategy in qualitative research.

It was necessary for the researcher to make use of pre- and post-intervention questionnaires in which respondents were able to reflect upon their attitudes and perceptions prior to the intervention versus after it. By keeping the young age of the participants in mind, questions were kept to the minimum, using descriptive language to assist in all participants' understanding of what was being asked. Important deductions regarding the viability of the intervention with regards to using computer-technology, as well as the participants' engagement with the content of the Afrikaans FAL during the intervention, were made.

The pre-intervention survey consisted of twelve closed multiple-choice questions, each with five possible responses. In adhering to guidelines as stipulated by Maree (2016), questions were written in clear, concise language on a level which all participants understood. Questions were focussed on respondents' skills and attitudes towards the use of technology and the Internet at home and at school, as well as their level of comprehension in Afrikaans FAL. It also established the frequency of using technology in their personal and school lives as well as the level of assistance that they were able to receive in Afrikaans FAL at home. The qualitative nature of the questionnaire was to guide participants to establish their own attitudes before the intervention, in order to be compared to their outlook after being exposed to the tasks.

A post-intervention questionnaire was designed to guide learners to reflect on their experiences during the intervention and to establish whether they perceived any change in their understanding of the content. Of the ten questions, three were dichotomous while seven were closed multiple-choice questions.

Both questionnaires were made available online on Microsoft Forms and anonymously completed by participants before and after the intervention. The nature of online questionnaires is that they are self-marking and results were therefore automatically recorded. This method of administration is in line with Maree's (2016) recommendations to ensure as many as possible advantages in the decision of the administration method and to minimise possible disadvantages.

To ensure a controlled environment in which the researcher was available to assist if any questions were unclear, the link to the online questionnaire was made available on specific dates and times for each class to complete the surveys in their scheduled Afrikaans FAL lesson. Allowing participants to complete the questionnaires during school time increased the response rate significantly. Using an online method of completing the surveys minimised costs. The nature of online surveys also had the advantage that responses were recorded automatically, which improved data collection accuracy (Maree, 2016).

3.6.2 Intervention

Being the main vehicle of presentation of the study to the respondents, the design of the intervention was of crucial importance in order to shape the experiences of participants. The importance of a well-designed intervention for educational purposes is underlined by numerous researchers, including Engeström (2011), Cowan and Maxwell (2015) and Didion et al. (2017)

The curriculum outcome of the intervention was to apply the correct language structures when using Direct and Indirect speech in context in Afrikaans FAL. Computer-based activities were used to introduce and develop the concept progressively over a contact period of approximately four hours (spread over two weeks). The intervention was built using Microsoft OneNote Online as a platform. Each participant received the URL link to grant them access to the OneNote, on which URL links to the different activities of the intervention were also placed as different tabs. As a self-guided exercise, participants were able to complete activities in any order, repeat sections and even skip activities. Although formal contact time was used for the intervention, most activities (apart from locked activities) were available for learners to access in their own time from any place and device.

The content of the intervention was designed with the input of the Afrikaans Department at the school and was moderated by the Head of Department: Academics before being implemented. The school's assessment policy was followed during the moderation process, in that a detailed description of all activities, as well as its correlation to Bloom's

Taxonomy, was submitted for analyses and recommendations to both the Afrikaans Department and the Head of Department: Academics. For the purpose of this intervention, the levels of the SAMR model and how the activities in the intervention are reflected therein, was also included. The intervention was accepted as reflective of the levels of Bloom's Taxonomy and the SAMR model (L. W. Anderson et al., 2001; Puentedura, 2010) and approved by both the Afrikaans Department and the Head of Department: Academics.

As an intervention is aimed at improving understanding and ability (Fraser & Galinsky, 2010), the tasks within the intervention were designed to lead the participants progressively from the introduction of the content, to applying the acquired knowledge. As the research was not aimed to gather quantitative evidence of learners' progress, all the activities in the intervention were completed anonymously and no marks were recorded officially. However, as results to quizzes in the intervention are recorded automatically with timestamps, an anonymous list of all completions exists, which the researcher was able to use as an indication of levels of progressive acquisition in the intervention process.

To align with the educational purpose of the intervention in guiding learners to increased understanding and improved skill in applying knowledge, activities were designed to reflect the cognitive levels of Bloom's Revised Taxonomy (Anderson et al., 2001). As the purpose of the research was to establish the viability of using computer-based activities in the intervention, the design of the activities was also aligned with the SAMR model (Puentedura, 2010) in order to reflect different levels of technological implementation.

The outline of the different activities and how they were linked to the conceptual framework, is depicted in Table 3.1 with a detailed description of the activities below the table.

Table 3.1 Outline of intervention

COMPUTER-BASED INTERVENTION: DIRECT AND INDIRECT SPEECH (AFRIKAANS FAL)							
	Tool	**Task**	**Program / App**	**"Any place, any time" availabi-lity**	**Approxi-mated Time**	**Bloom's**	**SAMR**
1	Baseline quiz	Online multiple-choice quiz: Direct and Indirect speech	Microsoft Forms	Locked	15 minutes	Remembering	Substitution
2	Self-guided E-learning course	1. Explanatory video / visual presentations focusing on the rules of Direct/Indirect speech and the implementation thereof 2. MCQs as well as fill-in quizzes	Microsoft Sway, Powtoon Telagami, Piktochart, MakeBeliefs comix Microsoft Forms	Available	90 minutes	Understanding Applying Evaluating	Redefinition
3	Listening and applica-tion	Analysing Direct/Indirect speech via watching a video and answering MCQs	YouTube, Edpuzzle	Available	30 minutes	Analysing	Modification
4	Drill and practice exercise	Self-marking worksheet in which the correct application of rules is required before commencing to the next sentence	MS Excel	Available	45 minutes	Applying	Augmentatio n
5	Creative applica-tion	1. Creating a comic strip to demonstrate a conversation (direct speech) 2. Transcribing the direct speech in the comic strip to indirect speech 3. Using the indirect speech to record a video report	Flipgrid, MakeBeliefs Comix, MS Word	Available	60 minutes	Creating Analysing	Redefinition

3.6.2.1 Baseline quiz

Learners were able to establish their prior knowledge of the subject matter through completing a closed on-line quiz prior to starting the intervention. The quiz consisted of eight multiple choice questions focussing on what learners remembered regarding the concept, placing it on the “Remembering” level of Bloom’s Revised taxonomy (Anderson et al., 2001).

The self-marking quiz was designed on Microsoft Forms and made available through a ULR link on Microsoft OneNote. As the use of technology only replaced the traditional pen-and-paper method of completing a quiz, it was on the “Substitution” level of the SAMR model (Schrock, 2013). As the quiz was self-marking, results were available for review immediately after submission.

3.6.2.2 Self-guided e-learning course

In an attempt to unlock the curriculum content of the intervention in a logical, structured manner, a mini e-learning course was built, consisting of video- and slideshow presentations, audio explanations, visual prompts and infographics, textual explanations and self-marking quizzes.

The course was designed using Microsoft Sway, embedding different content into the slide show. The following apps, web apps and programs were embedded in the course:

- Video explanations: Powtoon and Telagami
- Infographics: Piktochart and MakeBeliefs Comix
- Quizzes: Microsoft Forms

As there are different aspects or rules regarding the application of Direct and Indirect speech, each rule was delivered separately, followed by a quiz in which respondents could measure their understanding and apply the rule. The purpose of the audio-visual explanations was to unlock and explain the curriculum content, while the purpose of the quizzes was for participants to evaluate their understanding and to apply the knowledge. These activities focused on the “understanding,” “applying” and “evaluating” levels of

Bloom's Revised Taxonomy (L. W. Anderson et al., 2001). "Redefinition" on the SAMR model was demonstrated, as the presentation of curriculum content in the manner of a customised e-learning course consisting of different media, is an example of a new, previously unimaginable way to implement technology (Puentedura, 2010).

Quizzes in the activity were either multiple-choice or fill-in, self-marked and immediately available for review after submission. Participants could go back and forth in the course and redo any available quizzes.

3.6.2.3 Listening and application

The South African National Curriculum requires first additional language teaching to not only be text-based, but also communicative, as the practical implementation of the language is the ultimate outcome (DoE, 2013a). In light of this requirement, practical interaction with and application of the curriculum content covered in this intervention, was needed. A listening activity of a practical example of an interview in which Direct and Indirect speech was used, was created to address this need.

This activity was created using the web app Edpuzzle. This app allows the user to interact with various online video sources. Participants were engaged in listening to the conversation and analysing speech patterns, while reflecting their findings through answering multiple-choice questions. Bloom's Revised Taxonomy was met on the "analysing" level (L. W. Anderson et al., 2001); giving participants control over the method of delivery of the listening text in allowing them to replay and relisten and therefore allowing them time to think about their observations, allowing for significant task redesign, which placed the activity on the "modification" level of the SAMR model (Schrock, 2013).

3.6.2.4 Drill and practice exercise

Correct application of the rules of Direct and Indirect speech was done through a drill and practise activity that was created on Microsoft Excel. The purpose of this activity was for participants to apply each rule correctly, focussing on all aspects of the concept.

While the results of the online quizzes in the e-learning course was available only after submission, results to each question on the Excel exercise could be observed immediately after a sentence was completed. This enabled participants to evaluate their responses immediately and be able to rethink their application strategy regarding each rule.

Participants were able to download the Excel document to their devices to complete individually on the desktop app or to collaborate with each other in completing it on Excel Online. This allowed peer coaching. The nature of the activity reflected on the “applying” level of Bloom’s Revised Taxonomy (Anderson et al., 2001) and on “augmentation” of the SAMR model, as participants were able to complete a basic drill and practice exercise, but with the added function that they were able to revise their application strategies immediately (Schrock, 2013).

3.6.2.5 Creative application

The final section of the intervention was also aimed at the practical interaction with content and the conversational aspects of language teaching. It consisted of three activities which required participants to apply knowledge on the “analysing” and “creating” levels of Bloom’s Revised Taxonomy (Anderson et. al., 2001). Using computer technology also allowed participants to engage in creating evidence of learning in ways that could not be attempted without the use of this technology. This reflects the “redefinition” stage of the SAMR model (Schrock, 2013).

Participants made use of the web app MakeBeliefsComix to create a comic strip in which they demonstrated Direct Speech. They then had to transcribe this into Indirect Speech using Microsoft Word, after which they recorded the Indirect Speech in the form of a television news report, using the web app Flipgrid. This section was reflective of the highest levels of both Bloom’s Revised Taxonomy and the SAMR model.

3.6.3 Group interviews

Maree (2016) highlights the importance of using interviews to obtain valuable data from the perspective of the participants. In order to establish the viability of the use of

computer-based interventions in teaching Afrikaans FAL, it was important to pay attention to the views of the participants in the intervention. Semi-structured group interviews were therefore conducted with participants to acquire their opinions regarding the content, presentation and practicality of the tasks within the intervention.

Groups consisted of four to five participants of stratified samples within the study. Interviews were conducted in November 2018 in the week after the completion of the intervention, at a time and place that was convenient to both the participants and researcher. The same set of semi-structured, open-ended questions were offered to all four groups, with the allowance for new emerging areas of enquiry.

Interviews were recorded and transcribed verbatim.

3.7 Data analysis

In analysing the data, the researcher aimed to understand if and how the perspectives of participants before and after the implementation changed. It was also necessary to investigate their perceptions of the interaction between content and technology used within the intervention, in order to understand their viewpoint towards the viability of using computer-based intervention in the teaching of Afrikaans FAL. It was therefore important to analyse the data as comprehensively as possible.

As the intervention was offered to all participants in the study, it was necessary to have data reflecting the general experiences of the broader population. The data obtained from the pre- and post-intervention surveys was also qualitatively analysed according to emerging trends, while the researcher also used the results from the quizzes in the intervention to establish a level of knowledge acquisition throughout the intervention.

Atlas.ti is computer software which assists in data analysis and was used in the qualitative analysis process of this study. All interviews were transcribed verbatim and uploaded to Atlas.ti. Emerging lines in the data were clustered and coded into categories with the software until a point of saturation was reached.

3.8 Methodological norms

The findings of qualitative research need to be reliable and trustworthy in order to be of practical use in the broader community (Noble & Smith, 2015). It was important for the researcher to focus on specific criteria to ensure that data was analysed in a reliable way. The foci to ensure trustworthiness in the study were credibility, transferability, dependability and confirmability, as suggested by (Guba, 1981).

3.8.1 Credibility

The interpretation of credibility according to McMillan and Schumacher (2014) testifies that the research findings should be trustworthy, true to what the participants communicated through their interaction with the researcher and without distortion. In order to establish credibility in this study, the researcher cross-checked interpretations with the participants, making sure that all communication was clear. Deductions made from interviews with participants were also aligned with data from other sources, such as surveys and quiz results. This was done in order to eliminate any possible source of error.

3.8.2 Transferability

The transferability of the study refers to its generalisation and how it can be applied to other contexts (Maree, 2016). Transferability in this specific study was of great importance, as the research questions focused on the viability of the research for future application. The findings should be transferable to not only Afrikaans FAL, but to other languages that are offered in the South African National Curriculum. It was therefore important to conduct the research with transferability as a foundation of the study.

3.8.3 Dependability

Connelly (2014) notes that research findings can change if the conditions in which it was conducted, change, which renders the study undependable. In order to ensure that a study is dependable, measures must therefore be taken to determine whether similar results will be reached in different situations. The researcher was able to establish dependability in the study by making the content of interventions available to teachers

and learners from other schools who experienced similar challenges in the teaching of Afrikaans FAL.

3.8.4 Confirmability

Confirmability refers to the unbiased reporting of findings in the research process (Connelly, 2014). The intervention was completed anonymously by participants. In addition, a clear audit trail of all data was kept at all stages of the study. The researcher made use of pseudonyms in transcribing interviews and transcriptions were audited by a colleague in the Afrikaans Department.

3.9 Ethical considerations

To ensure the protection of the participants of the study, the ethical considerations as promulgated by the University of Pretoria were followed at all times.

Letters of informed consent were offered to both the principal of the school and the academic director of the educational company. These letters clearly stated the aim, purpose and outline of the intervention. It also explained that the position of the researcher in the study is that of educator-researcher and therefore the academic intervention did not exclude or disadvantage any Gr 7 Afrikaans FAL learner.

Letters of informed assent were presented to all under-aged participants, stating the aim and purpose of the study. Participants who took part in the interviews received an additional form in which they gave their assent to the interviews. As the research involved minors, there was also a need for informed consent from parents or guardians.

The letters also stated that all participation was voluntary and that participants could withdraw from the study at any time, at which stage any existing data pertaining to them would be disregarded in the study. To eliminate any uncertainty about academic implications of withdrawing from the study, the letters also clearly stated that none of the tasks would be used for assessment purposes.

Further measures to protect confidentiality and anonymity were the use of pseudonyms throughout the analysis of the data. Participants were also reassured that all raw data would be protected with only the researcher having access to it.

3.10 Conclusion

The foundation of the study was firmly established through careful consideration of the research design and methods. With a clear scheme of action, the researcher was able to conduct the intervention and associated interviews to determine the viability of computer-based interventions in Afrikaans FAL teaching.

Chapter 4: Findings and interpretations

4.1 Introduction

This chapter focusses on the analyses of the data, as well as the interpretation thereof. In an effort to establish the viability of computer-based interventions in Afrikaans FAL teaching, the researcher needed to establish the attitudes of the end users towards such an intervention. This was done in support of the research of Beaudoin et al. (2009), where mention is made of the importance of understanding students' engagement with online content in order to secure effective online learning opportunities. Pearson (2018) also emphasises that feedback is imperative in constructing future benchmarks for learning, understanding and performance. As the study was conducted including a captive audience participating in the intervention, as well as volunteers who participated in semi-structured group interviews, different data types were collected to reflect the contribution of all participants. To draw meaningful conclusions regarding the viability of computer-based interventions in teaching Afrikaans FAL, the researcher needed the reflections of all participants in the study.

A pre-intervention survey was completed by all participants to determine their perceptions of the use of technology in general, as well as in their schoolwork. Further foci were on their attitudes towards Afrikaans FAL and the use of technology in the subject.

The intervention was followed by a post-intervention survey serving as an instrument to gather data concerning their personal experiences interacting with the curriculum content as well as the applied technology. The aim of this survey was to determine any change in attitudes of the general population in the study regarding the usefulness of computer-based interventions in Afrikaans FAL.

Semi-structured group interviews were conducted with seventeen volunteers in order to draw more comprehensive inferences regarding their experiences with the intervention.

4.2 Pre-intervention survey

Data obtained from the pre-intervention survey served as an instrument to establish the existing level of exposure to Afrikaans FAL and competence in the use of computer technology. It was important to determine these aspects prior to delivering the intervention, to serve as a control measure for any changed perceptions after its completion.

It also served as a measure to establish whether learners had more or less the same level of access to computer technology and the Internet in order to support the researcher's perception that all learners had equal opportunities and the sufficient skill sets to access the vehicle of delivery of the intervention.

The survey was created on Microsoft Forms and made available online during the introductory stage of the intervention in October 2018. It was completed anonymously by 57 participants, all of whom then proceeded to interact with the actual intervention.

The survey consisted of twelve multiple-choice questions with five response options each. The level of the responses varied from a very low level of exposure to computer technology or to interaction with Afrikaans FAL (Level 1), to a very high exposure (Level 5).

All the questions, with the exception of Question 10, had level indicators where Level 1 would reflect a response similar to "None/Never", Level 2 would be "Rarely", Level 3 reflected "Often", Level 4 "Mostly" and Level 5 would be "Always". The nature of Question 10 required the level indicators to be inverted to Level 1 reflecting "Always", Level 2 "Mostly", Level 3 "Often", Level 4 "Rarely" and Level 5 "None/Never".

To ensure that all respondents understood the specific criteria which reflected different levels of responses to the questions, broader descriptive responses rather than the level indicators were used in the multiple-choice instrument.

Questions 1 – 6 focussed on the respondents' exposure to computer technology at home and at school, while Questions 7 – 12 focussed on their perceptions regarding their experiences in learning Afrikaans FAL.

A thorough analysis of the questions featured in the pre-intervention survey is depicted in the following table:

Table 4.1 Pre-intervention survey analysis

Survey question	Response descriptions	Response level	No of replies
1. How often do you make use of **Internet** access **at home**?	Never	*1*	**0**
	Rarely	*2*	**1**
	When I need it	*3*	**17**
	A lot	*4*	**34**
	I am always online	*5*	**5**
2. How much access do you have to **different** electronic devices **at home**?	I don't use any electronic devices	*1*	**0**
	I am sometimes allowed to use someone else's device	*2*	**5**
	I have my own device	*3*	**11**
	I have my own device AND I may use other types of devices belonging to someone else in our house	*4*	**20**
	Everyone in our house has MORE THAN ONE DEVICE and we can use any device at any time	*5*	**21**
3. How skilled do you see yourself **in general** when working on a computer?	Not at all confident	*1*	**0**
	I'm trying	*2*	**2**
	Coping fine	*3*	**16**
	Quite good	*4*	**35**
	Expert - I prefer to spend most of my free time on the computer	*5*	**4**
4. How confident are you at using a computer **to do your school work**?	Not at all	*1*	**0**
	I try, but sometimes needs help	*2*	**13**
	I can do everything on my own	*3*	**13**
	I'm quite good and like to explore ways to use computers more in my schoolwork	*4*	**19**
	I'm an expert and would prefer to do all my schoolwork on computer or another device	*5*	**12**

Survey question	Response descriptions	Response level	No of replies
5. How often do you use the **Internet** to assist you in doing **homework for various school subjects**?	Never	*1*	0
	Rarely	*2*	8
	When the assignment requires me to	*3*	31
	A lot, especially to find out more about a subject	*4*	18
	All the time. I cannot do schoolwork without the Internet	*5*	0
6. How often do you use technology such as computers or devices **at school**?	Never	*1*	1
	Rarely	*2*	2
	Only in computer class	*3*	46
	A lot, in different classes	*4*	7
	All the time, in every class	*5*	1
7. How well do you understand Afrikaans when **listening** to it?	Not at all	*1*	1
	I understand some words, but not enough to follow the conversation	*2*	8
	Although I don't understand ALL words, I am able to follow the conversation	*3*	20
	I understand most of the conversation, with only a few words that I am unsure about	*4*	12
	I understand the entire conversation	*5*	16
8. How well do you understand Afrikaans when **reading** it?	Not at all. A dictionary doesn't even help	*1*	0
	I am trying but need a dictionary most of the time	*2*	15
	I understand a lot and only sometimes need a dictionary to assist with difficult words	*3*	21
	I understand most of what I read but can't always answer the questions about what I've read	*4*	9
	I understand everything, I don't need a dictionary and I am able to answer questions about what I have read	*5*	12
9. How confident are you when learning **complicated Afrikaans language rules**?	Not confident at all. I usually give up	*1*	0
	Trying, but need a lot of guidance	*2*	8
	Coping fine. I understand but make mistakes because I don't always apply the rules correctly	*3*	29
	I am very confident. I rarely make mistakes	*4*	19
	I'm an expert and NEVER make any mistakes	*5*	1

Survey question	Response descriptions	Response level	No of replies
10. **How much assistance** do you need from your **parents, tutors or other source**s when doing **Afrikaans** homework or revision?	All the time. I cannot do it on my own	*1*	0
	A lot	*2*	10
	Sometimes	*3*	20
	Almost never, only with very difficult concepts	*4*	21
	None at all	*5*	6
11. If you **do** need help with Afrikaans homework or revision **at home**, how available will that help be?	Never. There is no-one who can help me	*1*	2
	Rarely. I (or my parents) have to go to great lengths to organise someone to help me	*2*	5
	When I need help, it is usually available, although sometimes I have to wait for a suitable time	*3*	16
	When I really need help, I can get it easily	*4*	15
	There is always someone who can help me	*5*	19
12. How often do you use the **Internet** to search for information and/or assistance when doing **Afrikaans** homework?	Never	*1*	7
	Sometimes	*2*	18
	Only when the assignment requires it and a website is provided	*3*	14
	A lot. I use all the Internet resources that my teachers motivate me to use	*4*	14
	All the time. I have even found helpful Afrikaans sites on my own	*5*	4

As the researcher's aim was on qualitative analysis of the survey results, inferences regarding respondents' perceptions prior to the intervention were drawn by identifying trends in the results, rather than numerical facts.

Keeping in mind that the dual focus of the pre-intervention survey was on participants' perceptions of the use of technology and the Internet, as well as on Afrikaans FAL, analyses of these aspects were done separately.

4.2.1 Computer experience

The first six questions of the pre-intervention survey were targeted on determining participants' skills using computers in order to establish their ability to participate in computer-based interventions.

In studying Figure 4.1, respondents' perceptions of the use of technology such as the Internet and computers tend to lean more towards the higher-level indicators, namely Levels 3, 4 and 5 as specified in the pre-intervention survey. From this it can be gathered that all respondents had sufficient skill sets and experience to be able to participate in computer-based interventions. It can also be deduced that respondents had a positive attitude towards the use of computers in educational projects.

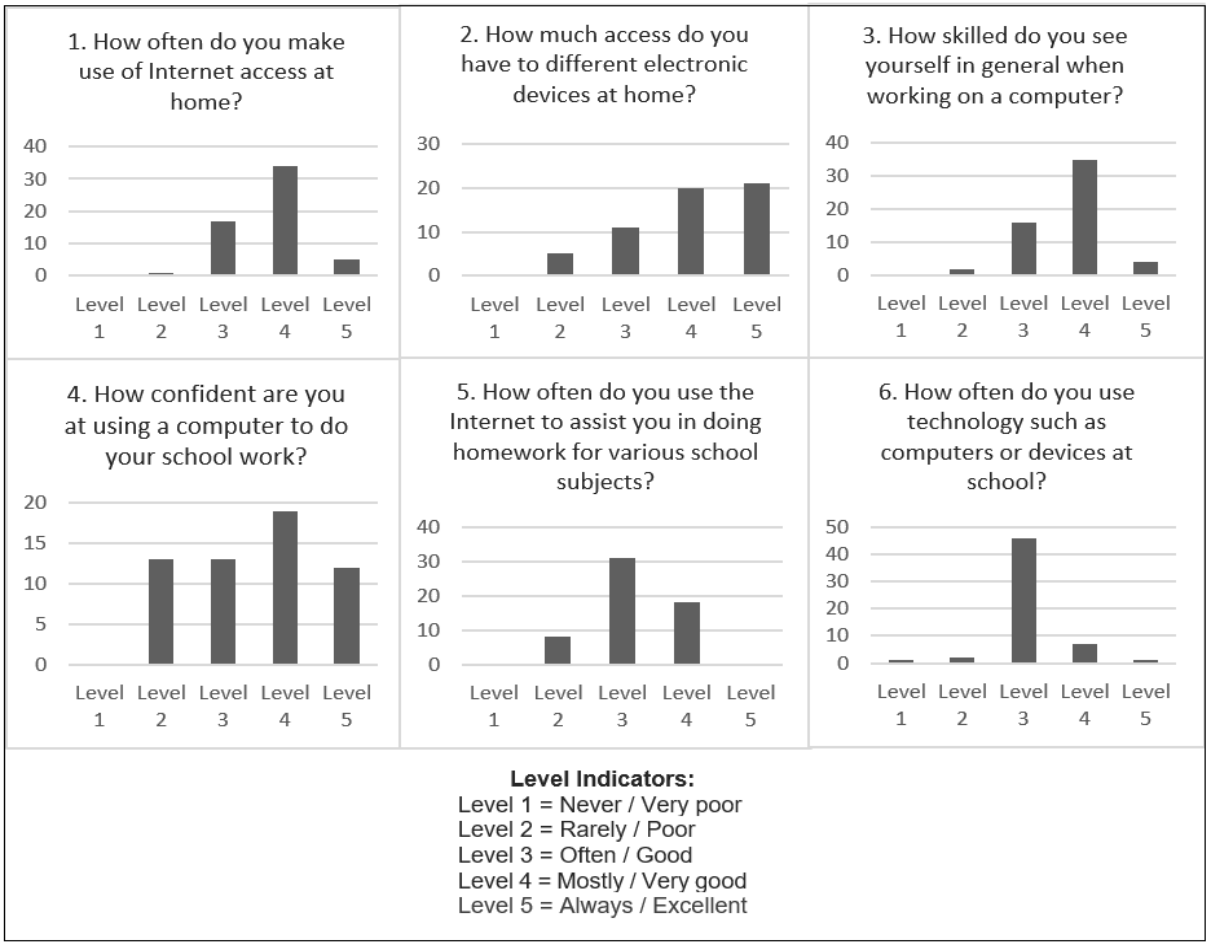

Figure 4.1 Visual analyses of pre-intervention survey questions relating to perceptions regarding the use of technology

In referring to Figure 4.1, it can be seen that only one respondent rarely uses the Internet (Level 2 response indicator), while 5 indicated that they are always online (Level 5 response indicator). With regards to having access to electronic devices, only 5 respondents indicated that they do not own their own devices but are, allowed to use someone else's device while at home (Level 2 response indicator). It is important to note that 20 out of the 57 respondents owned their own device (Level 4 response indicator),

while 21 additional respondents owned more than one device each (Level 5 response indicator).

Al-Emran, Elsherif, and Shaalan (2016) noted that students' motivation and confidence in using technology is influenced by ownership of a mobile device such as a smart phone, tablet or computer. It was therefore in line with this statement that, when asked how skilled respondents see themselves in general when working on a computer, the majority perceived themselves as being "quite good" (Level 3 response indicator), with no respondents replying that they were not at all confident (Level 1 response indicator). Four respondents even regarded themselves as experts when it comes to working on a computer (Level 5 response indicator).

However, when asked how confident they were in using computers to do their schoolwork, thirteen respondents indicated that although they try, they still need help (Level 2 response indicator). In comparison, the next question related to their confidence when using the Internet for homework purposes, with only eight respondents replying that they rarely use it (Level 2 response indicator) and the majority (31 out of the 57) responded that they used it when the assignment requires them to (Level 3 response indicator). It was also the perceptions of an overwhelming 46 out of the 57 respondents that technology such as computers is used only in the computer class at school and not much in subject teaching.

It is therefore important to note that, although respondents see themselves as having confidence in their computer skills, most used computers for educational purposes only when required to do so, and not necessarily as an invaluable source of information in their daily academic life. The notion that many respondents have that computers are not used that much in their school with regards to assignments, might also indicate that most of them are under the impression that computer-based interventions are not a possible solution for subject teaching, much less in Afrikaans FAL.

However, one of the most important inferences that was determined in the survey, was that all participants at least had access to the Internet and electronic devices at home,

albeit that they had different levels of usage. All were therefore equipped to participate in the intervention on an equal footing.

4.2.2 Attitudes regarding Afrikaans FAL

Questions 7 – 12 of the pre-intervention survey were targeted on determining participants' attitudes toward learning and understanding new concepts in Afrikaans FAL.

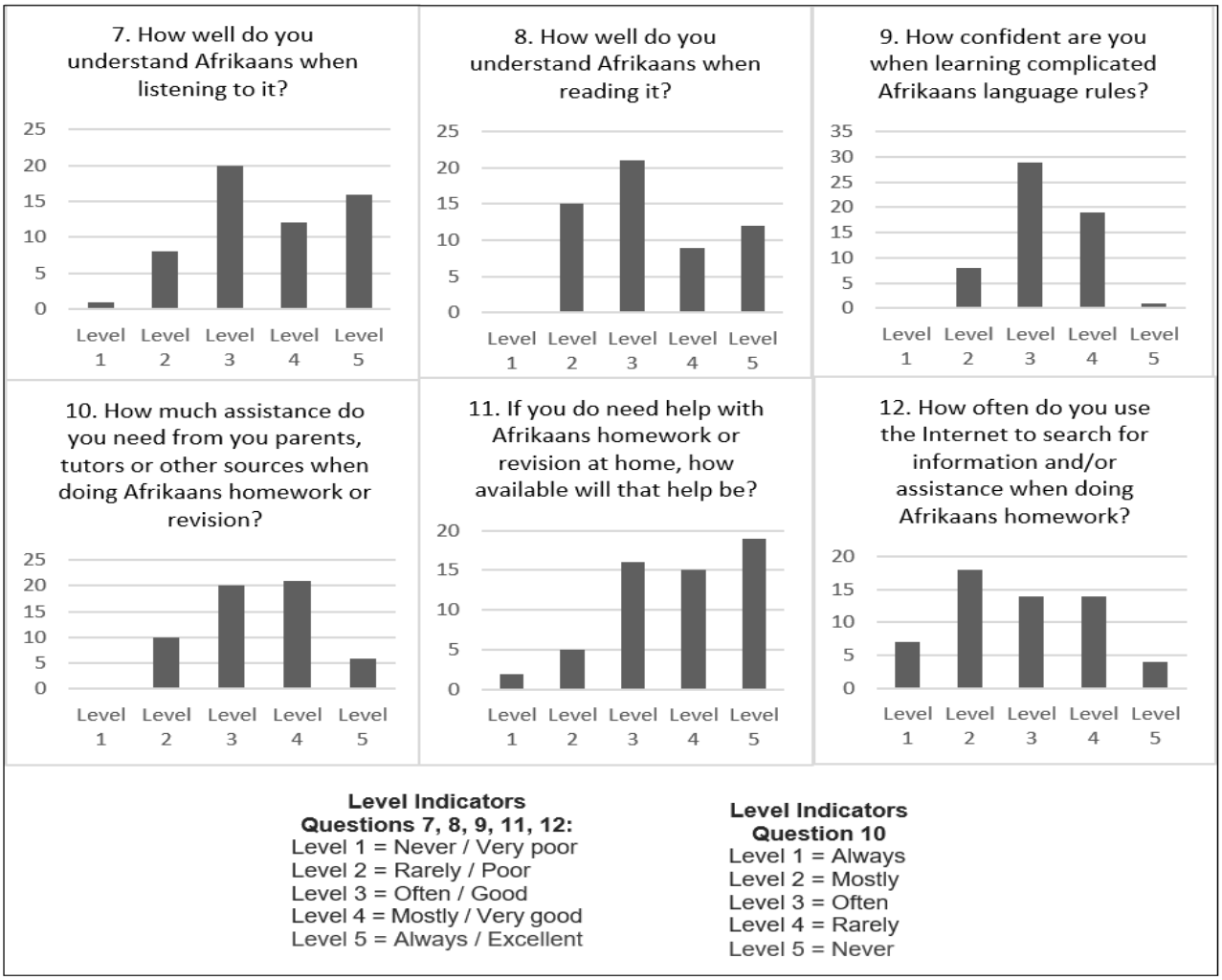

Figure 4.2 Visual analyses of pre-intervention survey questions relating to attitudes regarding Afrikaans FAL

By studying the visual presentation of the collected data in Figure 4.2, the researcher noticed that although participants had varying attitudes towards understanding and learning Afrikaans, the majority seemed to have a basic to good understanding of the language as well as a positive support system in their acquisition of the language.

In questions regarding their comprehension of Afrikaans when hearing or reading it, most respondents reacted on the Level 3 response indicator, implying that they feel they have a good understanding of the language. There were more respondents who indicated that they understand the language very well or excellently (Levels 4 and 5 response indicators) when listening to it, than when reading it.

It is also important to note that 15 out of the 57 respondents felt that they were able to understand Afrikaans poorly (Level 2 response indicator) when they had to read it, in comparison to only 8 respondents replying that they felt the same when listening to Afrikaans. This indicates that they will have a lower confidence in their comprehension when they are confronted with written instructions and explanations in comparison to being instructed verbally.

In both the studies of Jeon and Yamashita (2014) and Floris and Renandya (2017) the correlation between reading and listening comprehension and the acquisition of grammar is evident. The current study is supportive of this statement in that the overwhelming response when asked about their confidence in learning new language structures, participants indicated the Level 3 response indicator option (Good), in line with the previous results regarding their understanding when reading or listening to the language.

Prior to the study, the researcher had the preconception that participants did not have adequate support at home regarding homework and revision in Afrikaans FAL. However, the results of the pre-intervention survey somewhat altered this impression. While 47 of the 57 respondents did indeed indicate that they needed assistance often or always (Level 4 – 5 response indicators), only 8 were of the impression that such assistance was never or rarely available (Level 1 and 2 response indicators).

It is nevertheless evident from the responses to Question 12 that such assistance was not often accessed through computers. The majority of respondents mentioned that they used computers or the Internet rarely in doing research or seeking assistance when doing Afrikaans FAL work (Level 2 response indicator). This supports the notion that

participants did not have an existing perception that computers can be useful in learning Afrikaans FAL.

In analysing the pre-intervention results regarding respondents' attitudes towards Afrikaans FAL, it can be inferred that, although most respondents had a positive attitude towards the subject and their abilities in it, they still felt that they needed further assistance and were not looking to computers as a possible means to obtain that support.

4.3 Post-intervention survey

In order to determine the viability of computer-based interventions in teaching Afrikaans FAL, it was important to establish changes in the attitudes of participants after the intervention. This supports the statement from Pearson (2018) that feedback from respondents is imperative in establishing future benchmarks for learning, understanding and performance.

It was necessary for respondents to reflect upon their engagement with the intervention if they were to be expected to give valuable feedback regarding their final attitudes. According to Didion et al. (2017) motivation plays an important role in overcoming academic obstacles and that intervention strategies can be applied to improve intrinsic motivation. The post-intervention survey was designed to guide respondents towards reflecting on their experiences with the intervention and to establish whether their motivation and comprehension regarding the content had decreased or increased during their engagement with the activities.

Fraser and Galinsky (2010) explains that the success of an intervention relies on the design and development thereof. The survey consisted of ten questions with multiple-choice response options. The responses differed between "yes-no" responses to more detailed response choices. The design of the post-intervention survey was such that while Questions 1 – 6 focused on the practical impact of the survey, Questions 7 – 10 focused on the value of specific activities within the intervention. These foci were applied to establish whether the design of the intervention was sufficiently instructive and addressing the necessary levels of Bloom's Revised Taxonomy (L. W. Anderson et al.,

2001) as well as the SAMR model (Puentedura, 2010). By gaining feedback from participants regarding these questions, the researcher attempted to determine whether participants changed their perceptions towards accepting the possibility to use computer-based interventions in learning Afrikaans FAL or dismissing the notion.

The responses of the participants are reflected in the following table:

Table 4. 2 Post-intervention survey analysis

Survey question	Response description	No of replies
1. Were you able to do **all the activities** in the intervention?	YES	**27**
	NO	**30**
2. Choose only ONE option to **describe the intervention**.	Fun	**6**
	Boring	**8**
	Difficult	**3**
	Too long	**8**
	Interesting	**10**
	Helpful	**22**
3. Was the intervention **easy to do** on the computer?	No - I didn't understand the instructions	**2**
	No - all the links did not work	**5**
	Yes - the instructions were clear	**34**
	Yes - It was very basic	**16**
4. Do you **understand more** about Direct and Indirect speech?	YES	**45**
	NO	**5**
	I'm not sure	**7**
5. Were there enough **explanations**?	No, I need more	**8**
	Yes	**49**
6. Were there enough activities where you could **practise** what you've learned?	No	**8**
	Yes	**49**

Survey question	Response description	No of replies
7. Which activity did you **not like**?	All	**6**
	Be Creative: Application of knowledge	**3**
	Excel: Drill and practise	**24**
	Listening comprehension: video analyses and application	**5**
	Sway: Video explanations, slideshows and mini-quizzes	**4**
	None	**15**
8. Which activity was the **most fun**?	All	**3**
	Be Creative: Application of knowledge	**2**
	Excel: Drill and practise	**15**
	Listening comprehension: video analyses and application	**12**
	Sway: Video explanations, slideshows and mini-quizzes	**19**
	Undecided	**3**
	None	**3**
9. Which activity did you **struggle** with most?	All	**0**
	Be Creative: Application of knowledge	**1**
	Excel: Drill and practise	**30**
	Listening comprehension: video analyses and application	**5**
	Sway: Video explanations, slideshows and mini-quizzes	**16**
	None	**5**
10. Which activity was the **most helpful** to teach you about Direct and Indirect Speech?	All	**4**
	Be Creative: Application of knowledge	**0**
	Excel: Drill and practise	**13**
	Listening comprehension: video analyses and application	**5**
	Sway: Video explanations, slideshows and mini quizzes	**31**
	None	**4**

In analysing the data of the survey, it is evident that although 30 respondents were not able to complete all activities in the intervention (Question 1), only 8 found that it was too long (Question 2). It can be assumed that participants who did not complete the

intervention were sufficiently engaged in the activities to still find value in the parts of the intervention that they were able to complete.

When asked to describe the intervention in one word (Question 2), 32 out of 57 participants found that the intervention was either interesting (10 responses) or helpful (22 responses). A further 6 reflected that it was fun, while only 8 regarded it as boring. This indicates that most perceptions changed from not viewing computer-based interventions as a viable source of learning Afrikaans FAL, to seeing it as an acceptable solution. The evidence to support this statement is overwhelming in that 45 out of 57 respondents felt that they understood the content better (Question 4), 49 out of 57 felt that the computer-based explanations were sufficiently clear (Questions 5) and 49 out of 57 also indicated that there was an adequate amount and combination of activities to enable them to practise acquired knowledge and skills (Question 6).

An interesting trend emerged with regards to the design of activities within the intervention. The Excel exercise, which focussed on drill and practise skills, and the Sway, which focused on video explanations, slides and mini quizzes, generated more feedback from respondents than the activities that were focused on application of knowledge. Participants indicated these two activities both as most fun (Question 8) and most helpful (Question 10).

It is also interesting to note that while participants regarded drill and practise exercises (Excel) as helpful (13 responses – second highest response rate regarding helpfulness of certain activities), it was also this activity that they struggled with most (Question 9, 30 responses). Even though a great number of participants struggled with the activity, many recognised that the effort they had to put in to completing the activity resulted in a greater understanding of the content. From this, it can be deduced that participants regarded challenging activities as helpful in intrinsic motivation towards academic development.

The post-intervention survey results reflected that most participants regarded the intervention as helpful in their learning and that they had an improved attitude in interacting with computer-based interventions in Afrikaans FAL.

However, survey results contained only general feedback, and fall short of valuable qualitative data reflecting the individual experiences of respondents as to why their attitudes were altered during the intervention, resulting in understanding perceptions regarding the viability of using computers as the vehicle of instruction in Afrikaans FAL interventions.

4.4 Interviews

Maree (2016) mentions the value of qualitative interviews in obtaining substantial descriptive data to understand respondents' perceptions of events and interactions. The researcher needed more specific feedback regarding the successes and challenges within the intervention, both pertaining to interaction with technological aspects and Afrikaans concepts.

In the aftermath of the intervention, semi-structured group-interviews were conducted with participants who volunteered to give their input regarding these matters. A set of interview questions was posed to these respondents in which they were able to explain their thoughts surrounding their pre-intervention perceptions in comparison to after the intervention, as well as elaborating on the experiences they had while interacting with it. They were also able to give their opinions regarding the future use of computer-based interventions in Afrikaans FAL.

4.4.1 The participants

Nineteen Gr 7 Afrikaans FAL learners who participated in the intervention volunteered to discuss their experiences in a group setting. Even though participation in the interviews was voluntary, the researcher identified the need to group respondents into four purposive clusters.

The following table reflects the demographics of the population of the respondents who volunteered for the interviews. As interviews were conducted with four groups, each group was assigned a letter (A, B, C or D), while different respondents in the group were given a number ranging from 1 to 5.

Table 4.3 Demographics of respondents

	Gender	Race	Competency level in Afrikaans FAL	Afrikaans as a mother tongue speaker
Respondent A1	Male	Coloured	Below average	No
Respondent A2	Male	White	Below average	No
Respondent A3	Female	Black	Below average	No
Respondent A4	Female	Indian	Below average	No
Respondent A5	Female	Indian	Below average	No
Respondent B1	Female	White	Above average	Yes
Respondent B2	Female	White	Above average	Yes
Respondent B3	Female	White	Above average	Yes
Respondent B4	Female	White	Above average	Yes
Respondent B5	Female	White	Above average	Yes
Respondent C1	Male	White	Average	No
Respondent C2	Female	White	Average	No
Respondent C3	Female	Black	Average	No
Respondent C4	Female	Black	Average	No
Respondent C5	Male	White	Average	Yes
Respondent D1	Female	Black	Average	No
Respondent D2	Male	Black	Below average	No
Respondent D3	Female	White	Below average	No
Respondent D4	Male	Indian	Average	No

To reflect the general population in the study, all interview groups were heterogenic with respect to gender and race. However, the researcher found that certain aspects should be taken into consideration regarding stratification of groups.

Intervention research cannot be conducted without a clear purpose for the intervention (Engeström, 2011). Respondents were therefore grouped with regard to the nature of the purpose of the intervention for individuals.

Group A consisted of respondents whose parents indicated that they struggled with the subject and requested additional help from the school. The intervention was therefore a necessary instrument to provide an alternative method of instruction to improve their academic competency.

The purpose of the intervention for Group B focused on differentiation, motivation and opportunities for personal expression, as this group consisted of mother tongue speakers who expressed their desire for enrichment in the subject.

The respondents in Group C all had an average competency in Afrikaans FAL and felt confident in their current engagement with the subject. The final group (Group D) consisted of a combination of respondents whose current competency in Afrikaans FAL is either average or below average. The purpose of the intervention for both Group C and Group D focused on using computer-based activities as an added, rather than alternative, method of instruction, as respondents showed that paper-based instruction adequately served them in their academic processing. The researcher was interested in their perceptions towards the value of added instructions in the form of computer-based activities leading towards possible academic improvement.

4.4.2 Preconceptions toward computer-based interventions

When participants were asked to comment on their expectations prior to the intervention, it became evident that there were specific trends that dominated their perceptions. Their responses highlighted ten main preconceptions which the researcher was able to group into three categories of expectation, namely a) anxiety due to complexity of content, b) negative feelings towards the effectivity of using only computers in the learning process and c) positive expectations towards the use of technology.

The ten preconceptions were grouped in the following way:

a) Anxiety due to complexity of content
    - Teacher-learner interaction is necessary when learning complex language structures.
    - Higher level Afrikaans FAL activities are confusing.
    - Vocabulary and pronunciation of Afrikaans FAL is problematic.
b) Negative feelings toward the effectivity of using only computers in the learning process
    - Technology is not always reliable.

- Using technology in learning is tedious and time consuming.
- Teacher-learner interaction is absent when using computers as the vehicle of instruction.
- The use of “pen-and-paper” is a necessary cognitive process.

c) Positive expectations toward the use of technology

- Implementation of technology to learning activities is refreshing.
- Using computers allows self-paced progress.
- Using “pen-and-paper’ is exasperating.

The frequency of issues raised by participants are set out in the following table:

Table 4.4 Preconceptions of the intervention

Preconception	Group A	Group B	Group C	Group D	Totals
a) Anxiety due to complexity of content					***(8)***
Teacher-learner interaction is necessary when learning complex language structures.	0	0	3	1	**4**
Higher level Afrikaans FAL activities are confusing.	2	0	0	1	**3**
Vocabulary and pronunciation of Afrikaans FAL is problematic.	1	0	0	0	**1**
b) Negative feelings toward the effectivity of using only computers in the learning process					***(12)***
Technology is not always reliable.	0	2	1	0	**3**
Using technology in learning is tedious and time consuming.	0	2	0	0	**2**
Teacher-learner interaction is absent when using computers as the vehicle of instruction.	0	0	3	0	**3**
The use of "pen-and-paper" is a necessary cognitive process.	3	0	1	0	**4**
c) Positive expectations toward the use of technology					***(15)***
Implementation of technology to learning activities is refreshing.	0	3	3	0	**6**
Using computers allows self-paced progress.	0	0	1	2	**3**
Using "pen-and-paper" is exasperating.	4	1	0	1	**6**

4.4.2.1 Anxiety versus positive expectations

An important inference that can be drawn from the data is that the preconceptions that respondents harboured, focused more around the use of technology than their anxiety

about the academic content. Concerns regarding Afrikaans were only raised 8 times, while 27 mentions were made in connection to the use of technology.

It is also noteworthy that most respondents had feelings of anxiety, with concerns being raised 20 times, either regarding the academic content or the use of computers and only 15 mentioning that they were excited about the prospect of using computers in interacting with the content.

Respondent A3 raised her concerns about the difficulty and complexity of the subject content by stating “I was scared, because I thought the Afrikaans was going to be very difficult … much more difficult.” The words of Respondent A1 supported these feelings, in that he mentioned that “it would be a struggle to just do it on computers, because of the pronunciation and all of that.” It was a comment by Respondent C3, however, that elaborated best the reason why anxieties surrounded the effectivity of using computers as the primary vehicle of instruction. She said: “I do struggle with Afrikaans, and I feel it’s much better to have someone personally, because when you ask certain questions and when you don’t understand, it’s not like the computer can explain it to you the way you want to understand it, because I could read this and still not understand it. But with the teacher, she can explain it.” Preconceptions therefore existed that there would not be sufficient assistance in addressing issues such as pronunciation, comprehension and complex grammar structures with which respondents already struggled.

The above quotation from Respondent C3 is also reflective of her doubts that computers could be used effectively in the instruction of Afrikaans FAL. Respondent C4 was more concerned that she would not be able to fully understand all the instructions on the computer and that she would somehow miss out on certain aspects of the intervention if she struggled with the technology.

However, the two issues that were mentioned by most respondents were of a positive nature, in that both the use of computers as a vehicle of instruction was refreshing and that they prefer using computers above pen and paper activities. These were mentioned six times each. Respondent D3 noted that he was excited that he was going to use the

computers, because it “is something we don’t get to do every day”, with Respondent D3 adding “I thought it would be easier to work with, because I find it better to work on a computer. I understand better.” Further support for using computers rather than pen and paper, were expressed by Respondents A1 (who said that he worked too slowly when using pen and paper), A4 (who complained that writing gives her cramps) and B5 (who recognised that she is unable to work neatly when using pen and paper). These statements are supportive of the findings of Alonso (2015) that handwriting is often a slower procedure than typing.

4.4.2.2 Conflicting feelings

Some respondents expressed that they had conflicting feelings regarding the use of computers as the vehicle for an intervention in Afrikaans FAL. For example, both Respondent A1 and Respondent A2 stated that they thought working on the computers would be easier due to the use of pen and paper being exasperating, but also mentioned that they believed that physical writing is an integral part of the cognitive process of learning. Respondent A1 further felt that while using a computer would be beneficial when giving written feedback on activities, he would miss the usual verbal instructions, as his reading comprehension has not yet developed enough to assist him in following instructions with ease. Floris and Renandya (2017) place emphasis on the importance of an adequate listening and reading comprehension in the acquisition of and confidence in all other language aspects, such as spelling, grammar, writing and speaking.

Respondent C3 also expressed her anxiety regarding the lack of much needed teacher-learner interaction in FAL learning, which conflicted with her feelings that the use of computer technology evolved so much that she was sure it would be a more effective way of learning.

4.4.3 Interacting with the intervention

It was also important to analyse respondents’ experiences during the intervention in order to determine whether respondents’ attitudes toward the viability of the use of computer-based interventions in Afrikaans FAL were revised. By interacting with the intervention,

respondents were able to review their perceptions and determine whether their anxieties were founded or if there were any aspects of using computers in learning Afrikaans concepts that proved beneficial. In the researcher's engagement with the respondents regarding their experiences with the intervention it became evident that there were more aspects that respondents identified which they found to be advantageous in learning Afrikaans FAL while using the computers, than issues that were detrimental to the process.

4.4.3.1 Self-paced nature

Tondeur et al. (2017) found that teachers often noted that the use of ICT in their lessons takes more time than traditional teaching methods. The self-paced nature of computer-based interventions supports this finding. It was interesting to note that, while some respondents welcomed this extended time element granted with the use of computers as a method of instruction, others felt that it held them back in finishing tasks timeously.

It is significant that the respondents who were annoyed at having to use the technology due to it taking up time (Respondents B2, B3 and B4) were above average in their competency in the subject, while those who welcomed the self-paced activities were average or below average in their abilities. Respondent B3 commented that viewing video explanations in the intervention took longer than just checking the explanation in a textbook, while B2 and B4 were frustrated with the time that typing and reviewing answers took. All three felt that written exercises were quicker to complete, and they found the drill and practise exercise tedious, as it required intensive revision of answers and they wanted to get on with the activity.

However, most respondents felt that the self-paced nature of the intervention assisted them in interacting with the content and gave them control over the delivery of the content. Respondent B3 contradicted her opinion that computer-based interventions took up too much of her time, by commenting that she did not fully grasp some of the content when it was explained in class, but during the intervention she was able to go back and review the concept on an infographic until she understood it. Respondent C4 summarised it appropriately in stating "what's nice is that you can go at your own pace and if you don't

understand something but your whole class understands something, your teacher carries on explaining most of the time, and you have to catch up at home, or you fall behind. But then with the computer, if you go at your own pace, all you know is that you have to get done at the end." Respondent A3 supported this benefit by commenting that by being able to access explanations in her own time, she felt that she didn't have to bother the teacher but was able to access explanations at her own pace when she needed it. Her comment was that "when you forget a step, you can go back to it, whereas, if when you are writing it, you can't keep on bothering the teacher, because they have other people to help too".

Respondents also felt that they could go back and review explanations or redo exercises, which led to higher retention of content. Respondent A4 said "if you forgot, you could go back", with Respondent A5 interrupting that "if I got it wrong, I could just go back and fix my mistake". Respondent D4's reflection that when doing traditional paper-based activities, one only gets one chance to attempt a question, but with computer-based activities one can continue redoing an activity until it is consolidated, summarises the benefits of repetition in computer-based interventions.

Respondents A2 and A4 both commented on the benefits of watching video explanations, as they were able to slow down or rewind the video for better comprehension, which is not possible in a traditional class setting. Respondent C4 supported this in her remark that "you can move back to the videos and see what you're missing or what you're doing wrong for the question you keep on getting wrong."

In analysing the respondents' comments, the researcher can infer that the benefits of computer-based interventions addresses the problem of Afrikaans FAL teachers having to cover content in a limited time-frame, as learners are able to access and review content at their own pace and in their own time.

4.4.3.2 Catering for different intelligences and levels of proficiency

Gardner (1983) presented that learners process information in different ways, which gave rise to his theory of multiple intelligences. The researcher relied on the conceptual

framework in which the SAMR model (Puentedura, 2010) and Bloom's Revised Taxonomy (L. W. Anderson et al., 2001) were used as a guiding mechanism in the design of activities to progressively develop the cognition and comprehension of the complex language content in the intervention.

Respondents identified positively with the value of being presented with activities on different skill and intelligence levels, as they recognised that different learners learn in different ways. Respondent A4 voiced it in a very simple way when she remarked "some people listen for information, while some like to read to get things right". Different respondents mentioned how different activities in the intervention benefited them most, such as Respondent C2 preferring the audio explanations above the visual prompts, Respondent C3 finding the video clips most helpful, or Respondent D1 choosing to refer back to the visual infographics when she needed more assurance.

Another example of respondents preferring to interact with content in a different way, was when Respondent B5 remarked that she found the creative activity ineffective and unnecessary, with Respondent B1 immediately replying that for her it was the most effective activity as it challenged her on a practical level in which she could best express her comprehension of the content.

Respondents furthermore remarked that the activities were not only beneficial to students who learn in different ways, but also to those who have different proficiency levels in Afrikaans FAL. Respondent A2 mentioned how he noticed activities on the different levels of Bloom's Revised Taxonomy (L. W. Anderson et al., 2001) by saying "some questions were higher order thinking and others were straightforward", with Respondent D1 also stating "some activities were too complex, but others were straightforward and I could understand". She also mentioned that she found that some activities would benefit learners who "understood the work from previously, but if you are unfamiliar with the work, I think you would find it difficult."

It was the view of Respondent C2 that it was helpful that there were different activities for different proficiency levels and how it contributed to growing comprehension, as she

stated that “I think it was really helpful, for the kids that struggle, to do the smaller activities, but then it just followed and you could later straight on apply it in the other activities, the harder ones. It got a lot easier later”. Respondent B1 best expressed this benefit in her comment that “children who struggle can do the easier exercises separately, while we, who don’t struggle so much, can continue with the high-level stuff and they can then do it later.”

4.4.3.3 Further benefits of computer-based interventions

Respondents observed further benefits of using computers during the Afrikaans FAL intervention and communicated these to the researcher. These advantages lend further support to the viability of such interventions.

4.4.3.3.1 Step-by-step instructions

During the interviews it became evident that respondents appreciated the step-by-step structuring that existed within the intervention. They felt that the content was easily manageable and explained in an organised way and thus assisted them in feeling motivated to engage with it.

Respondent A1 remarked “in the book it doesn’t give step-by-step instructions but because we did it on the computer it actually helped more”, while Respondent A2 explained that he felt that more detailed instructions were given in the computer-based intervention than in class discussions. Respondent C3 explained that it is often difficult to follow instructions in class when she said, “in class I would listen to you, but someone would always talk to me and I would never actually hear what you were saying, and afterwards I won’t know what to do.” Respondent C2 confirmed her remark by saying that in class, instructions are given only once, while the instructions on the computer assisted her in being able to go over the directions at her own pace and with more understanding.

4.4.3.3.2 Immediate feedback

Another characteristic of the online activities was that feedback was immediately available after completion of a question, which encouraged participants to review their work without

delay and thus increased motivation to master the specific concepts. The link between feedback and motivation is recognised by researchers such as Burgers et al. (2015) and Marthouret and Sigvardsson (2016) and the benefits of it in the intervention can therefore not be disregarded.

Respondent D4 mentioned that “on the computer you could correct yourself and see what you did wrong each time, but in the book, you have to give it a go and hope you have it right.” This supports the notion that using paper-based activities does not assist in immediate revision and that learners often lose the thread of what they got right or wrong.

Both Respondents B3 and D2 remarked that learners often do not bother to look at corrections in their books, with Respondent B3 saying “I just feel that most people think okay, nobody does it anyway, and then just before exams, they try to get all the answers.”

It was the comment by Respondent C5 which best described the value that immediate feedback has on the revision process, in that he said “you think it’s right and then you are totally confused as to why it says you are wrong, but then you just think logically and you go through it until it shows that you have it right. And you are just so excited you got it right that you want to try the next one!”

4.4.3.3.3 Improving vocabulary

There were also respondents who commented that they felt that using computer-based interventions improved their vocabulary more than ordinary class discussions or paper-based activities. They expressed the advantage of being able to rewind or slow down a video clip if they did not immediately understand, in comparison to not always having the time or confidence to ask the teacher to repeat herself in class. Respondent D4 mentioned that “most of the time I can understand, but sometimes when it is fast and I want to ask, the teacher is already explaining the next thing.” Respondent A3 explained that subtitles and supportive English texts in the online explanations assisted her in understanding Afrikaans terms that confused her previously. Respondent A2 also explained the value of digital texts in his comment that “if you’re looking at the screen, you can highlight and see what the word means, and it translates sometimes”. This reflects the findings of Chester

et al. (2016) which determined that automatic translation allows learners to retain vocabulary faster than the tedious process of consulting a dictionary or thesaurus.

4.4.3.4 Challenges regarding the use of computer-based interventions

It is important, however, to note that respondents did not experience all aspects of the intervention positively and that they identified possible challenges that can be experienced in the use of computer-based interventions.

4.4.3.4.1 Technology is not always reliable

Some respondents experienced complications during the drill-and-practise exercise in Excel in that the formula did not accept answers as correct where slight alterations in punctuation or additional word orders were made, even if it was applied correctly. Although they recognised the benefits of this specific activity within the intervention, numerous comments were made about the confusion that arose due to this issue. Respondent C2 expressed her frustration with regards to this in her words “the Excel didn’t like me, because every time I’d put something down, it would not give me the mark! So it would be wrong and then I’d check and then rewrite it and it just got me very confused in what’s wrong and what’s right.” Respondent A1 also commented on this by saying “I checked my rules and I did everything, but it still gave me wrong” and was supported by Respondent A2 who said that even after discussing the rules in their group, their responses were still incorrect on the activity.

A few of the respondents also had difficulty opening hyperlinks or activities from home. Respondent D2 mentioned that the password was not accepted when he attempted the intervention on his home computer, while both Respondents A2 and D3 mentioned that they did not have sufficient bandwidth to open certain activities in the intervention at home. Respondent A2’s remark that “not everyone has enough data at home” summarises the ongoing problem of high data costs that South Africa is experiencing, which is detrimental to online distance education for many communities (Pretorius, 2019; Seeth, 2018).

4.4.3.4.2 The impersonal nature of technology

While the above-mentioned issues raised concerns regarding the reliability and availability of the technology, respondents also offered personal opinions regarding the use of computer-based interventions, especially with reference to Afrikaans FAL. Respondents A2, C3 and C4 were very vocal in their opinion that teacher-learner interaction is of great importance and would be a shortfall in computer-based interventions. Respondent A2 mentioned that “computers would not go into as much details sometimes and I would not want to be taught by a screen, I’d rather be taught by humans”, while Respondent C3 expressed the importance of teacher interaction by commenting that “I do struggle with Afrikaans, and I feel it’s much better to have someone personally, because when you ask certain questions and when you don’t understand, it’s not like the computer can explain it to you the way you want to understand it”.

Eizi and Talaei (2019) emphasise learner interchange as a valuable part of the learning process, as students would often put their best foot forward when trying to explain a concept to peers. During the interviews it became apparent that respondents also felt that peer interaction forms an integral part of learning an additional language and that this issue would not necessarily be sufficiently addressed through computer-based activities. Respondent A5 mentioned that often in a traditional class setting, peer coaching often leads to higher cognition, by saying “if you don’t understand, you can ask someone and when they explain you can understand better”, while Respondent A2 commented that communication on an online platform is not always similarly effective and that “if it is online, people take longer to respond”. By analysing respondents’ opinions in these issues, it can be deduced that some respondents are apprehensive concerning the impersonal nature of computer-based interventions.

Another ambivalent perception that was raised by respondents B3, B4 as well as B5 was that although computer-based activities are available at any place and time, it takes longer to complete than similar paper-based exercises. Respondent B4’s statement that “it took very long and when you have to retype what you have incorrect, it takes even longer” and Respondent B3 mentioning “I felt that it took a lot of time to complete

everything, but in the workbook, I can write everything quickly" supports their concern. They also mentioned that they felt that this will be detrimental to learners wanting to interact with such interventions, which was best expressed by Respondent B3's comment that "few people will go and look at it and most will just leave it and use the workbook."

The concerns raised by respondents regarding the nature of the use of technology in the learning process could not be disregarded in establishing the viability of computer-based interventions in the teaching of Afrikaans FAL.

4.5 Conclusion

In analysing data gathered both before and after the intervention, the researcher was able to make valuable inferences regarding learner perceptions with reference to the challenges and benefits of using computers as a vehicle for the intervention, the practicality of computer-based instruction and activities in Afrikaans FAL learning, as well as improved cognition and motivation to learn Afrikaans concepts.

In both the surveys and interviews, participants initially reflected a measure of anxiety towards the feasibility of such interventions. Although they perceived themselves as being sufficiently computer literate and mostly harboured a positive approach towards Afrikaans, respondents were hesitant in their expectations that complex language aspects could be successfully taught by using computers as the vehicle of instruction.

Both the captive audience as well as the participants who were interviewed noted that there were activities of different skill levels and that learners of different intelligences were able to focus on activities that best complimented their learning styles. The data also reflected that participants in both the surveys and the interviews acknowledged the educational value of difficult exercises in that they mentioned that although they struggled with the Excel (drill-and-practise), they regarded it as valuable in the consolidation of their learning.

Another important similarity that was reflected in both the post-intervention survey and the interviews, was that most participants viewed the intervention as helpful and felt that

they understood the concepts better after interacting with the computer-based activities. While 45 out of 57 of the captive audience indicated that they found it useful, fourteen of the nineteen interviewees expressed their satisfaction with it. The following comment by Respondent C3 reflects the advantages of the intervention: “for me, it helped a lot more than what I thought it would, like I couldn’t ever imagine being able to learn off a computer, but it actually did help. In fact, I studied for my exams as well now on the computer, so it’s definitely helped a lot. For Afrikaans, I didn’t even do anything with paper, I studied for my whole Afrikaans exam on the computer. Because it helped a lot.”

A question that was only included in the interviews, but not in the post-intervention survey, was whether participants would interact with similar computer-based Afrikaans FAL interventions. All nineteen interviewees concluded that they would and expressed the request to have other aspects of the language available on the same platform. Respondent A1 requested that all language rules must be made available as computer-based interventions, while Respondent A4 went even further and requested that “the whole year’s work, the whole book, must be there, on one thing”. Respondent C1 also recognised the benefit that prolonged access to computer-based interventions would have going on to high school, by commenting that “if it was for the whole of Afrikaans, then it would be much more helpful for high school, because with the link we can do everything and we could build on what we already have.”

The similarities between the perceptions of the captive audience and the interviewees both before and after the interventions, together with additional conclusions that came to light during interviews regarding the benefits and challenges experienced during the intervention, assisted the researcher in considering the viability of computer-based interventions in Afrikaans FAL teaching. These inferences could assist Afrikaans FAL teachers in finding a possible alternative methods of instruction with which to supplement teaching a large concentration of content in the limited time that they have at their disposal.

Chapter 5: Conclusions and recommendations

5.1 Introduction

Focussing on the challenges of low student motivation and time constraints in covering the Afrikaans FAL curriculum, the researcher's aim with the study was to establish the viability of computer-based interventions as a supplementary method of instruction to alleviate such obstacles. It is important to note that, although participants in the study were subjected to a language intervention using computers as the vehicle of instruction, academic reflections resulting from the intervention were not the focus of the study.

Qualitative interpretations were drawn from participants' experiences with the intervention to establish if Afrikaans FAL teachers can successfully use similar interventions to support them in the instruction of complex Afrikaans language structures. The conclusions with regards to these interpretations and how it relates to the research questions and conceptual framework, are discussed in this chapter.

It was the aim of the researcher to fill gaps in the literature regarding the use of computer-based interventions in Afrikaans FAL teaching. While some limitations became apparent during data interpretation, the contribution to existing research is indisputable and thus indicated in this chapter. Recommendations for further study are also included.

5.2 Addressing the research questions and conceptual framework

The interpretation of the data was underpinned by the research questions which scaffolded the process in which viability could be determined. While the main question enquires about the ways in which computer-based interventions can improve learner motivation and cognition of complex language structures in Afrikaans FAL, the sub questions focus on a) challenges or benefits that learners experience using computer technology in their own learning, b) how the correspondence between computer-based interventions and the SAMR model and Bloom's Revised Taxonomy contribute to progressive intervention and c) how learner motivation and cognition is revised during the process of computer-based interventions in Afrikaans FAL.

5.2.1 Enhanced motivation

Researchers have identified numerous factors that influence learner motivation (Almusharraf, 2018; Kampkuiper, 2015; Lasagabaster, 2011). In correlation with the research of Ger and Bahar (2018), participants in the study understood the need for and had a positive attitude towards learning an additional language. Yet, although they were competent in the use of computers and the Internet, they were initially doubtful towards using computers to learn complex language structures. They voiced their concerns that they were nervous about not having the teacher delivering the content.

However, analyses of the data reflect that after completion of both the post-intervention survey and the interviews, respondents exhibited an altered perception of the viability of computer-based interventions. In the population of 57 participants who completed the post-survey intervention, 38 responded positively when asked what they thought of the intervention. Interviewees were impressed that using the computers as the vehicle of instruction allowed content to be presented in an organised, structured way which could be accessed at the user's own time and pace.

Participants in the interviews also mentioned how their self-efficacy was enhanced by easy and clear instructions and by them being able to have control over the delivery of content. The influence that these aspects have on increased motivation, is reflective of the studies of Dündar and Akçayır (2014) and Harandi (2015).

As numerous authors underline the importance of academic achievement in learner motivation (Didion et al., 2017; Lasagabaster, 2011; Moskovsky et al., 2013), the researcher found it necessary to interlink improved cognition and enhanced motivation. Although no quantitative summative results of participants' efforts were collected, the qualitative analyses indicated that respondents felt that they benefited academically from the intervention and all nineteen interviewees indicated that they would profit from similar interventions in other language concepts.

The conclusion is therefore that learner motivation is positively revised by the introduction of computer-based interventions in Afrikaans FAL teaching.

5.2.2 Improved cognition

As there was no pre-intervention instrument to establish actual cognition of the specific content before the intervention, the researcher had to rely on respondents' feedback to determine if an improvement in cognition was achieved.

Analyses of participants' general cognition of Afrikaans prior to the intervention indicated that most had an average to high comprehension of the language. This was again reflective of the research of Ger and Bahar (2018) in that they stated that learners who recognise the value of learning an additional language, will have a positive attitude towards the language and will strive to master it. Taking into consideration that some of the respondents speak Afrikaans as a home language, the researcher accepted that some of these learners might not show an improved cognition, as the initial traditional lesson covering the content might have been sufficient for them to consolidate the offered content.

However, when analysing the responses from the participants, it became evident that most learners, home language speakers included, found that they had a better understanding of the content after the intervention than before. Of the 57 respondents in the post-intervention survey, only 5 indicated that they did not have a higher cognition of the language structure that was dealt with. Again, only 5 of the 19 interviewees did not specifically indicate their improved understanding of the content.

The benefits of the computer-based interventions on the cognition of home language speakers was substantiated by the Respondent B3's comment that, while she often found that she misunderstood a concept when it was covered in the class situation, the computer-based activities gave her the opportunity to ensure she understood each aspect by carefully going over the different slides and activities.

These comments lead the researcher to conclude that, regardless of the lack of pre-existing data regarding cognition levels prior to the intervention, respondents' feedback supplied enough evidence to conclude that computer-based interventions can contribute positively to the improvement of cognition levels in Afrikaans language aspects.

5.2.3 Challenges and benefits

For the researcher to understand how computer-based interventions can be perceived from the learners' viewpoint and thus being able to form an insight into the viability of such interventions, benefits and challenges as experienced by the end-users formed the focus of one of the research questions.

While analysing the data using Atlas.ti software, the researcher noted that challenges regarding the intervention were mentioned 35 times, but participants responded with positive comments regarding the benefits of computer-based interventions 137 times.

5.2.3.1 Challenges

Challenges identified by respondents centred mostly around the unreliability of technology and its impersonal nature. Norman (2016) identifies similar issues in her research. Concerns that were raised included:

- The lack of sufficient bandwidth or data can make computer-based interventions impractical as it will limit access
- Hyperlinks, websites and passwords sometimes don't respond
- Closed formulas in self-marking activities can limit different interpretations of the content
- Computers lack personal interaction with teachers or peers, in that it has limited capabilities for in-depth discussion
- Computer-based interventions take longer to complete than paper-based activities.

Although these challenges have merit in themselves, the researcher is of the opinion that it does not pose a crippling threat to implementation of computer-based interventions, as it does not impact on the effectivity of the outcome of the intervention. The issues that were raised seemed to be more emotionally driven due to struggles with the hardware and not by frustrations regarding the academic content.

5.2.3.2 Benefits

Numerous benefits were highlighted in the data analyses as identified by the respondents. These aspects also contributed to enhanced learner motivation and cognition, which coalesce the research questions.

The researcher identified the most noteworthy aspects mentioned by the respondents as:

- Instructions presented in the intervention were clear, structured and easy to follow, which increased self-efficacy in users
- Immediate feedback improves corrective behaviour
- The self-paced nature of computer-based interventions motivates independent learning
- The integration of the SAMR model and Bloom's Revised Taxonomy in the intervention design contributes to progressive learning
- The integration of the SAMR model and Bloom's Revised Taxonomy in the intervention design accommodates learners of different intelligences and learning styles.

The benefits mentioned by interviewees focus more on how computer-based interventions help to improve their cognition of the academic content, rather than on their emotional interaction with it. This leads the researcher to believe that these aspects contribute to such interventions being viable to use in Afrikaans FAL teaching, as it motivates learners to accomplish the cognitive levels as well as the lesson objectives.

The benefits experienced by participants were predominant over the challenges that they encountered. Therefore, the researcher concluded that, although these challenges should be considered by teachers when designing interventions, it should not be a deterring factor in the implementation of computer-based interventions in Afrikaans FAL teaching.

5.2.4 Conceptual framework contributing to progressive intervention design

As the designer of the intervention, the researcher applied the conceptual framework in the construction of all activities in the intervention. In establishing the conceptual framework, Bloom's Revised Taxonomy and the SAMR model (L. W. Anderson et al., 2001; Puentedura, 2010) were integrated with the purpose of guiding the process of amalgamation of the digital and cognitive aspects of the intervention. Tang and Zhang (2013) commented on the importance of thoughtful consideration in the integration of technology and content when designing learning materials and therefore the framework was important in establishing progressive academic development and ensuring a learning platform which included learners of all learning styles and intelligences.

In her interaction with the participants, the researcher became aware that they appreciated activities which had different levels of cognitive application, contained different media, and were aimed at various learning styles. They perceived that they could choose activities that addressed their individual comprehension level while at the same time reflecting their choice of learning style and that they could progress to activities which required higher cognitive application when they felt comfortable with their own consolidation.

Participants' recognition of the progressive nature of the intervention due to careful interaction between digital assignments and cognitive requirements as expressed through the SAMR model and Bloom's Revised Taxonomy, led the researcher to conclude that the conceptual framework was imperative in the functionality of the intervention and thus establishing the viability of it in the teaching of Afrikaans FAL.

5.4 Limitations of the study

Although the study was done qualitatively, the absence of quantitative data to reflect the influence of the intervention on the academic performance of participants, was noteworthy. The inclusion of such data would have increased the credibility of the study and made the findings more justifiable (Maree, 2016).

Educational intervention research is focused on specific populations where specific areas of change are needed (Engeström, 2011; Fraser & Galinsky, 2010). The intervention was deployed using the population of only one school. Although sufficient data was recovered from the participants, it would have been beneficial if the same intervention could have been repeated at another school where teachers experience the same challenges in order to amplify the transferability of the study.

5.5 Recommendations

The researcher recommends that the study is duplicated using a broader population which can include multiple schools, as well as different age groups and language foci. This will evaluate the transferability of the research and motivate teachers to accept the benefits of computer-based interventions in additional language teaching.

It would also be advisable to follow a mixed research methodology in future replications of study to include the benefits that quantitative data have on reflecting academic development during educational intervention research.

5.6 Contribution of the study

The researcher identified a gap in the literature regarding alternative instruction platforms to alleviate challenges that teachers experience when teaching Afrikaans FAL (Thornhill & Le Cordeur, 2016). The results of this study address that gap and can be applied to teachers' decision making when planning language interventions in first additional language teaching. As similar issues are faced by educators teaching other South African languages on both home language and first additional language level (Kotzé, Van der Westhuizen, & Barnard, 2017; R Wildsmith-Cromarty & Turner, 2018), the findings can be applied to those languages as well.

While studies focussing on the application of e-learning on secondary and tertiary level exists (Hilton, 2013; Tayebinik & Puteh, 2012; Wong, bt Osman, Goh, & Rahmat, 2013), not much research has been done to establish the impact of these on primary school learners. This study contains valuable insights from primary school learners regarding their perceptions while interacting with computer-based interventions and can be used as

a reference in studies pertaining to technology use in primary schools. It also identifies challenges and benefits that the implementation of technology to learning has on learning motivation and cognitive enhancement. The value of these inferences on the impact and viability of e-learning initiatives to younger learners, will contribute to the South African government's vision to expand the use of digital technology in learning to all schools (Masondo & Slatter, 2019; "Western Cape drives e-learning initiative," 27 July 2017).

5.7 Suggestions for future research

Norman (2016) noted that learners often have a lower completion rate when doing online courses, than when taking a traditional course. A statement made by Respondent B3 that it was her opinion that when given a choice, people would discard the computer-based intervention and return to paper-based learning material, led the researcher to identify the need for research regarding factors influencing student perseverance in e-learning courses.

5.8 Conclusion

Acknowledging the problem that exists regarding the obstacles that Afrikaans FAL teachers face in their task of presenting the subject and striving to identify a suitable supporting method of instruction, the researcher set out to make inferences which would elucidate the viability of implementing computer-based interventions.

Using the conceptual framework as foundation, a computer-based intervention was designed and presented to expose FAL learners to Afrikaans language structures being presented on a digital platform.

Data was collected through surveys and interviews and analysed focusing on how it relates to the research questions.

By analysing the data, it became evident that participants found that the intervention benefited them not only in their cognition of the content, but also improved their motivation to engage with similar content in future interventions. The challenges that they identified

regarding the use of technology during the intervention did not negatively influence their acceptance of the convenience and benefit of the venture.

It is therefore the researcher's conclusion that computer-based interventions can be perceived as viable in the teaching of difficult Afrikaans FAL concepts and that teachers can apply similar interventions to alleviate the stresses of low learner motivation, weak support structures in revising concepts and time constraints of a strenuous curriculum.

By adhering to the research procedures and methodologies, the conclusions to which the researcher came, can be perceived as reliable and trustworthy.

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7. Appendices

7.1 Appendix A

Faculty of Education

Dear Sir/Madam,

INVITATION FOR YOUR COMPANY (ADvTECH) TO PARTICPATE IN A RESEARCH PROJECT:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I am currently enrolled for a Master's degree at the University of Pretoria. Part of the requirements for the awarding of this degree is the successful completion of a significant research project in the field of education.

The title of my approved research study is**: The viability of computer-based interventions in Afrikaans First Additional Language teaching**

This study is concerned with the investigating of the potential of using computers and e-learning as a vessel to teach and learn complex concepts in Afrikaans as a first additional language.

Your company is hereby invited to participate in this research project that will be conducted with Grade 7 Afrikaans FAL students at Southdowns College. The study aims to

- Investigate the extent to which computers can be used to learn complex Afrikaans language concepts
- Explore a variety of computer activities to progressively increase comprehension and implementation of Afrikaans language rules and structures; and
- Explore the challenges and successes learners experience when using computers as intervention tools when doing academic work.

Discussed here is the scope and responsibility of your participation. To gather the information that I require, I am requesting permission to conduct a computer-based intervention on the concept of direct and indirect speech with Gr 7 Afrikaans FAL learners from Southdowns College, as well as small focus-group interviews with some of the learners after completing the intervention. Learners and their parents will receive individual invitations to participate in the intervention as well as in the interview process. Those who do agree to participate will be interviewed about certain aspects of the intervention and how it affected their learning. While the intervention will be conducted over a two-week period, covering about 5 contact hours of Afrikaans FAL, the interviews should take no longer than 30 minutes, and can be conducted at school during a time which will suit all participants. The interviews will be recorded on audio for transcription and data collecting purposes only, and will not be shared to any individuals at school, in the company (Advtech) or at the University of Pretoria. I have included here for your information a schedule of interview questions and a short survey.

Please understand that the decision for your company to participate is completely voluntary and that permission for your participation will also be protected by the University of Pretoria. Please also note that each individual's participation in the study will be completely voluntarily and will in no way either advantage or disadvantage them. Each participant will be free, at any stage during the process up to and including the stage at

which they authenticate the transcript of their interview, to withdraw their consent to participate, in which case their participation will end immediately without any negative consequences. Any and all data collected from them up to that point in the study will then be destroyed.

All the information obtained during the research study will be treated confidentially, with not even the Department of Education having access to the raw data obtained from the interviews. At no time will either your company, the relevant school or any of the individual participants be mentioned by name or indeed be allowed to be identified by any means in the research report.

At the end of the study, you will be provided with a copy of the research report containing both the findings of the study and recommendations. This research presents a unique opportunity for your company to get involved in the process of research aimed at exploring ways to improve first additional language teaching and learning through computer technology. If you decide to allow your company's participation, kindly show this by completing the consent form at the end of this letter.

Thanking you in anticipation.

Yours in service of education,

MGJ Maré

Student Researcher

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LETTER of CONSENT

COMPANY AS PARTICIPANT

VOLUNTARY PARTICIPATION IN THE RESEARCH PROJECT ENTITLED:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I, _____, the _____ of

Advtech Group, hereby voluntarily and willingly agree to allow participation in the above-mentioned study introduced and explained to me by Margaretha Gertruida Johanna Maré, currently a student enrolled for an MEd degree at the University of Pretoria.

I further declare that I understand, as explained to me by the researcher, the aim, scope, purpose, possible consequences and benefits and methods of collecting information proposed by the researcher, as well as the means by which the researcher will attempt to ensure the confidentiality and integrity of the information she collects.

_____ _____

Full name Signature

_____

Date

7.2 Appendix B

Faculty of Education

Dear Mr Labuschagne

INVITATION FOR YOUR SCHOOL (SOUTHDOWNS COLLEGE) TO PARTICPATE IN A RESEARCH PROJECT:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I am currently enrolled for a Master's degree at the University of Pretoria. Part of the requirements for the awarding of this degree is the successful completion of a significant research project in the field of education.

The title of my approved research study is**: The viability of computer-based interventions in Afrikaans First Additional Language teaching**

This study is concerned with the investigating of the potential of using computers and e-learning as a vessel to teach and learn complex concepts in Afrikaans as a first additional language.

You and your school are hereby invited to participate in this research project, which aims to

- Investigate the extent to which computers can be used to learn complex Afrikaans language concepts

- Explore a variety of computer activities to progressively increase comprehension and implementation of Afrikaans language rules and structures; and
- Explore the challenges and successes learners experience when using computers as intervention tools when doing academic work.

Below is the scope and responsibility of your participation. To gather the information that I require, I am requesting permission to conduct a computer-based intervention on the concept of direct and indirect speech with Gr 7 Afrikaans FAL learners, as well as interviews with some learners after completing the intervention. These learners and their parents will receive an individual invitation to participate in the interview process. Those who do agree to participate will be interviewed about certain aspects of the intervention and how it affected their learning. While the intervention will be conducted over a two-week period, covering about 5 contact hours of Afrikaans FAL, the interviews should take no longer than 30 minutes, and can be conducted at school during a time which will suit all participants. The interviews will be recorded on audio for transcription and data collecting purposes only, and will not be shared to any individuals at school, at the University of Pretoria or the Department of Education. I have included here for your information a schedule of interview questions and a short survey.

Please understand that the decision for your school to participate is completely voluntary and that permission for your participation will also be protected by the University of Pretoria. Please also note that each individual's participation in the study will be completely voluntarily and will in no way either advantage or disadvantage them. Each participant will be free, at any stage during the process up to and including the stage at which they authenticate the transcript of their interview, to withdraw their consent to participate, in which case their participation will end immediately without any negative consequences. Any and all data collected from them up to that point in the study will then be destroyed.

All the information obtained during the research study will be treated confidentially, with not even the Department of Education having access to the raw data obtained from the interviews. At no time will either your school or any of the individual participants be mentioned by name or indeed be allowed to be identified by any means in the research report.

At the end of the study, you will be provided with a copy of the research report containing both the findings of the study and recommendations. This research presents a unique opportunity for your school to get involved in the process of research aimed at exploring ways to improve first additional language teaching and learning through computer technology. If you decide to allow your school's participation, kindly show this by completing the consent form at the end of this letter.

Thanking you in anticipation.

Yours in service of education,

MGJ Maré

Student Researcher

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Dr M Mihai

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(082) 430 2928

LETTER of CONSENT

SCHOOL AS PARTICIPANT

VOLUNTARY PARTICIPATION IN THE RESEARCH PROJECT ENTITLED:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I, _____, the principal of

_____hereby voluntarily and willingly agree to allow my school to participate in the above-mentioned study introduced and explained to me by Margaretha Gertruida Johanna Maré, currently a student enrolled for an MEd degree at the University of Pretoria.

I further declare that I understand, as explained to me by the researcher, the aim, scope, purpose, possible consequences and benefits and methods of collecting information proposed by the researcher, as well as the means by which the researcher will attempt to ensure the confidentiality and integrity of the information she collects.

_____ _____

Full name Signature

_____

Date

School stamp

7.3 Appendix C

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education

Dear Sir/Madam,

INVITATION FOR YOUR CHILD TO PARTICPATE IN AN INTERVENTION IN A RESEARCH PROJECT:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I am currently enrolled for a Master's degree at the University of Pretoria. Part of the requirements for the awarding of this degree is the successful completion of a significant research project in the field of education.

The title of my approved research study is: **The viability of computer-based interventions in Afrikaans First Additional Language teaching**

This study is concerned with the investigating of the potential of using computers and e-learning as a vessel to teach and learn complex concepts in Afrikaans as a first additional language.

Your Gr 7 child are hereby invited to participate in the computer-based intervention, which aims to

- Investigate the extent to which computers can be used to learn complex Afrikaans language concepts
- Explore a variety of computer activities to progressively increase comprehension and implementation of Afrikaans language rules and structures; and
- Explore the challenges and successes learners experience when using computers as intervention tools when doing academic work.

Please take note of the scope and responsibility of your child's participation. To gather the information that I require, I am requesting permission for your child to take part in a computer-based intervention on the concept and implementation of direct and indirect speech in Afrikaans FAL. The intervention will be conducted during normal Afrikaans FAL periods at school, using the school's laptops and Internet. I have included here for your information a short survey which each learner will be completing prior to the intervention.

As the intervention will take up teaching time, it is of importance to note that the content that will be addressed in the intervention, is parallel to what the normal teaching scope for the intervention period will be. The intervention is designed to be an alternative method to teach the prescribed content in an effort to improve learner comprehension of a difficult language concept. The decision for your child to participate in the intervention or not will not influence his /her grades, as none of the results obtained during the intervention will be used for assessment purposes. If your child choose not to participate in the intervention, he/she will continue to learn the same concepts using his/her workbook and prescribed textbook.

Please understand that the decision for your child to participate is completely voluntary and that permission for his/her participation will also be protected by the University of Pretoria. Please also consider that each individual's participation in the study will be completely voluntarily and will in no way either advantage or disadvantage them. Each participant will be free, at any stage during the process up to and including the stage at which they authenticate the transcript of their interview, to withdraw their consent to participate, in which case their participation will end immediately without any negative consequences. Any and all data collected from them up to that point in the study will then be destroyed.

All the information obtained during the research study will be treated confidentially, with not even the Department of Education having access to the raw data obtained from the interviews. At no time will either you as a parent, your child as an individual or your child's school be mentioned by name or indeed be allowed to be identified by any manner or means whatsoever in the research report.

At the end of the study, you will be provided with a copy of the research report containing both the findings of the study and recommendations. This research presents a unique opportunity for your child to get involved in the process of research aimed at exploring ways to improve first additional language teaching and learning through computer technology. If you decide to allow your child to participate in this study, kindly indicate this by completing the consent form at the end of this letter.

Thanking you in anticipation.

Yours in service of education,

MGJ. Maré
Student Researcher
University of Pretoria
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Dr. M. Mihai
Supervisor
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(082) 430 2928

PARENTAL CONSENT FORM FOR CHILD PARTICIPATION IN RESEARCH

VOLUNTARY PARTICIPATION IN THE RESEARCH PROJECT ENTITLED:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I, _____, being over the age of 18 years hereby consent to my child .....

participating, as requested, in the focus-group interview for the research project on in the above-mentioned study introduced and explained to me by Margaretha Gertruida Johanna Maré, currently a student enrolled for an MEd degree at the University of Pretoria.

I further declare that I understand, as was explained to me by the researcher, the aim, scope, purpose, possible consequences and benefits and methods of collecting information proposed by the researcher, as well as the means by which the researcher will attempt to ensure the confidentiality and integrity of the information she collects.

_____ _____

Parent / Guardian full name Signature

_____

Date

7.4 Appendix D

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education

Dear Grade 7 student

INVITATION TO PARTICPATE IN AN INTERVENTION IN A RESEARCH PROJECT:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

What is educational research?

Educational research is something we do to find new knowledge about the way people learn. We use research projects or studies to help us find out more about ways to improve educational practices.

What is this research project all about?

This project is to find out how useful computer activities of different difficulty levels are when learning complex language concepts in Afrikaans First Additional Language. The aim is to see if computers can be used to improve your understanding of these concepts.

Why are you invited to take part in this research project?

You have been invited to take part in this project because you are part of the Gr 7 Afrikaans FAL student body of your school and have proven yourself to have the needed computer skills to be able to complete all the computer-based activities that are planned for this intervention.

Who is doing the research?

The project is being done by Ms. Margaretha Gertruida Johanna Maré, who is at the moment enrolled for a Master's degree at the University of Pretoria. One of the requirements to successfully complete this degree, is to complete an educational research project that will help improve education practices.

What will happen to me in this study?

During this study, you will have the opportunity to increase your knowledge about direct and indirect speech in Afrikaans by using computers instead of textbooks and workbooks. The study, called an intervention, will happen at school during normal Afrikaans periods, using the school's laptops and Internet. It will take you about 2 weeks (5 hours) to

complete all the different levels of activities to guide you to a better understanding of the concepts.

Can anything bad happen to me?
There are no risks if you should agree to take part in the study.

Can anything good happen to me?
Studies were done that showed that using technology in completing schoolwork can improve students' understanding and marks. The studies even proved that students who struggle, showed a greater increase in their marks when they use computers, than students whose marks are already good. It is therefore possible that, by doing this computer-based intervention, you will have greater understanding of the concepts that will be taught, than you would have if you did not use computers.

Will anyone know I am in the study?
Your friends who are participating in the study with you, will know that you are taking part in the study, but everyone's responses and answers to the activities, will be kept confidential and not be discussed with other teachers or students. While your thoughts and ideas on the intervention will form part of the results of the study, your name will not be shared with anybody from the school, AdvTech or the University of Pretoria and you will be therefore be anonymous.

What if I do not want to do this?
You are not forced to take part in the research project, even if your parents give their consent for you to take part. If you choose to participate and decide on a later stage that you want to withdraw, all the data that was gathered from you, will be destroyed and none of it will be used in the study. If you choose not to participate in the computer-based intervention, you will continue to learn about direct and indirect speech using your workbook and textbooks and other activities.
Thank you that you are willing to consider this invitation to participate in the research project.

Yours in service of education,

MGJ. Maré
Student Researcher
University of Pretoria
u92004492@tuks.co.za
(084) 208 8358

Dr. M. Mihai
Supervisor
University of Pretoria
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(082) 430 2928

ASSENT FORM FOR PARTICIPATION IN RESEARCH

VOLUNTARY PARTICIPATION IN THE RESEARCH PROJECT ENTITLED:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I, _____understand that my parent(s)/guardian have/has given permission for me to take part in a research project about the usefulness of activities done on computers when learning and implementing difficult Afrikaans concepts. I am willing to take part in the computer-based intervention of the project done by Ms. MGJ Maré.

I understand what the study is about and what I will be doing when taking part in the study.

I am taking part because I want to. I have been told that I can stop at any time I want to and nothing will happen to me if I want to stop.

_____ _____

Your full name Signature

_____

Date

7.5 Appendix E

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education

Dear Sir/Madam,

INVITATION FOR YOUR CHILD TO PARTICPATE IN AN INTERVENTION AND INTERVIEW IN A RESEARCH PROJECT:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I am currently enrolled for a Master's degree at the University of Pretoria. Part of the requirements for the awarding of this degree is the successful completion of a significant research project in the field of education.

The title of my approved research study is: **The viability of computer-based interventions in Afrikaans First Additional Language teaching**

This study is concerned with the investigating of the potential of using computers and e-learning as a vessel to teach and learn complex concepts in Afrikaans as a first additional language.

Your Gr 7 child are hereby invited to participate in the computer-based intervention, as well as the focus-group interviews of this research project, which aims to

- Investigate the extent to which computers can be used to learn complex Afrikaans language concepts
- Explore a variety of computer activities to progressively increase comprehension and implementation of Afrikaans language rules and structures; and
- Explore the challenges and successes learners experience when using computers as intervention tools when doing academic work.

Below is the scope and responsibility of your child's participation. To gather the information that I require, I am requesting permission for your child to complete a computer-based intervention on the concept of direct and indirect speech with the rest of the Gr 7 FAL group, after which he/she is invited to participate in a focus-group interview discussing his/her perception of the intervention. While the intervention will be conducted over a two-week period, covering about 5 contact hours of Afrikaans FAL, the interviews should take no longer than 30 minutes, and can be conducted at school and during a time which will suit all participants in the focus groups. The interview will be recorded on audio for transcription and data collecting purposes only, and will not be shared to any individuals at school, at the University of Pretoria or the Department of Education. I have included here for your information a schedule of interview questions, as well as a short survey.

As the intervention will take up teaching time, it is of importance to note that the content that will be addressed in the intervention, is parallel to what the normal teaching scope for the intervention period will be. The intervention is designed to be an alternative method to teach the prescribed content in an effort to improve learner comprehension of a difficult language concept. The decision for your child to participate in the intervention or not will not influence his /her grades, as none of the results obtained during the intervention will be used for assessment purposes. If your child choose not to participate in the intervention, he/she will continue to learn the same concepts using his/her workbook and prescribed textbook.

Please understand that the decision for your child to participate is completely voluntary and that permission for his/her participation will also be protected by the University of Pretoria. Please also consider that each individual's participation in the study will be completely voluntarily and will in no way either advantage or disadvantage them. Each participant will be free, at any stage during the process up to and including the stage at which they authenticate the transcript of their interview, to withdraw their consent to participate, in which case their participation will end immediately without any negative consequences. Any and all data collected from them up to that point in the study will then be destroyed.

You can also choose for your child to only participate in the intervention but not in the focus-group interviews. If you choose to do so, please indicate this on the attached letter of consent.

All the information obtained during the research study will be treated confidentially, with not even the Department of Education having access to the raw data obtained from the interviews. At no time will either you as a parent, your child as an individual or your child's school be mentioned by name or indeed be allowed to be identified by any manner or means whatsoever in the research report.

At the end of the study, you will be provided with a copy of the research report containing both the findings of the study and recommendations. This research presents a unique opportunity for your child to get involved in the process of research aimed at exploring ways to improve first additional language teaching and learning through computer technology. If you decide to allow your child to participate in this study, kindly indicate this by completing the consent form at the end of this letter.

Thanking you in anticipation.

Yours in service of education,

MGJ. Maré

Student Researcher

University of Pretoria

u92004492@tuks.co.za

(084) 208 8358

Dr. M. Mihai

Supervisor

University of Pretoria

maryke.mihai@up.ac.za

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PARENTAL CONSENT FORM FOR CHILD PARTICIPATION IN RESEARCH

VOLUNTARY PARTICIPATION IN THE RESEARCH PROJECT ENTITLED:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I, _____, being over the age of 18 years hereby consent to my child _____, participating, as requested, in the intervention and focus-group interview for the research project on in the above-mentioned study introduced and explained to me by Margaretha Gertruida Johanna Maré, currently a student enrolled for an MEd degree at the University of Pretoria.

Or

I, _____, being over the age of 18 years hereby consent to my child _____, participating, as requested, in the intervention but NOT in the focus-group interview for the research project on in the above-mentioned study introduced and explained to me by Margaretha Gertruida Johanna Maré, currently a student enrolled for an MEd degree at the University of Pretoria.

I further declare that I understand, as was explained to me by the researcher, the aim, scope, purpose, possible consequences and benefits and methods of collecting information proposed by the researcher, as well as the means by which the researcher will attempt to ensure the confidentiality and integrity of the information she collects.

_____ _____

Parent / Guardian full name Signature

_____

Date

7.6 Appendix F

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education

Dear Grade 7 student

INVITATION TO PARTICPATE IN AN INTERVENTION AND INTERVIEW IN A RESEARCH PROJECT:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

What is educational research?

Educational research is something we do to find new knowledge about the way people learn. We use research projects or studies to help us find out more about ways to improve educational practices.

What is this research project all about?

This project is to find out how useful computer activities of different difficulty levels are when learning complex language concepts in Afrikaans First Additional Language. The aim is to see if computers can be used to improve your understanding of these concepts.

Why are you invited to take part in this research project?

You have been invited to take part in this project because you are part of the Gr 7 Afrikaans FAL student body of your school and have proven yourself to have the needed computer skills to be able to complete all the computer-based activities that are planned for this intervention. Your participation and ideas on the usefulness or challenges of the activities would be helpful to plan better ways of teaching Afrikaans as a first additional language.

Who is doing the research?

The project is being done by Ms. Margaretha Gertruida Johanna Maré, who is at the moment enrolled for a Master's degree at the University of Pretoria. One of the requirements to successfully complete this degree, is to complete an educational research project that will help improve education practices.

What will happen to me in this study?

During this study, you will have the opportunity to increase your knowledge about direct and indirect speech in Afrikaans by using computers instead of textbooks and workbooks. The study, called an intervention, will happen at school during normal Afrikaans periods, using the school's laptops and Internet. It will take you about 2 weeks (5 hours) to complete all the different levels of activities to guide you to a better understanding of the concepts.

After the study, you will be asked to participate in a short interview, together with 3 other participants, to share your ideas on your experience of the intervention. The interview will be no longer than 30 minutes and will be done at school, during a time that will suit everyone that participates. The interview will be recorded on audio to make it easy to rewrite. This is so that the researcher can gather information from your discussion to help her form an idea of how helpful the use of computers are when learning Afrikaans, and to see if there is anything she can do to improve the activities to help you even more.

Can anything bad happen to me?

There are no risks if you should agree to take part in the study.

Can anything good happen to me?

Studies were done that showed that using technology in completing schoolwork can improve students' understanding and marks. The studies even proved that students who struggle, showed a greater increase in their marks when they use computers, than students whose marks are already good. It is therefore possible that, by doing this computer-based intervention, you will have greater understanding of the concepts that will be taught, than you would have if you did not use computers.

Will anyone know I am in the study?

Your friends who are participating in the study with you, will know that you are taking part in the study, but everyone's responses and answers to the activities, will be kept confidential and not be discussed with other teachers or students. While your thoughts and ideas on the intervention will form part of the results of the study, your name will not be shared with anybody from the school, AdvTech or the University of Pretoria and you will be therefore be anonymous.

What if I do not want to do this?

You are not forced to take part in the research project, even if your parents give their consent for you to take part. If you choose to participate and decide on a later stage that you want to withdraw, all the data that was gathered from you, will be destroyed and none of it will be used in the study. If you choose not to participate in the computer-based intervention, you will continue to learn about direct and indirect speech using your workbook and textbooks and other activities.

Thank you that you are willing to consider this invitation to participate in the research project.

Yours in service of education,

MGJ. Maré

Student Researcher

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Supervisor

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ASSENT FORM FOR PARTICIPATION IN RESEARCH

VOLUNTARY PARTICIPATION IN THE RESEARCH PROJECT ENTITLED:

The viability of computer-based interventions in Afrikaans First Additional Language teaching

I, _____understand that my parent(s)/guardian have/has given permission for me to take part in a research project about the usefulness of activities done on computers when learning and implementing difficult Afrikaans concepts. I am willing to take part in both the computer-based intervention and an interview afterwards. The project is done by Ms. MGJ Maré.

I understand what the study is about and what I will be doing when taking part in the study.

I am taking part because I want to. I have been told that I can stop at any time I want to and nothing will happen to me if I want to stop.

_____ _____

Your full name Signature

_____

Date

7.9 Appendix G

Pre-intervention survey

The viability of computer-based interventions in Afrikaans First Additional Language teaching

1. How often do you make use of Internet access at home?

Never	Rarely	Only when I need it	A lot	I am always online

2. How much access do you have to different electronic devices at home?

I don't use any electronic devices	I am sometimes allowed to use someone else's device	I have my own device	I have my own device AND I may use other types of devices belonging to someone else in our house	Everyone in our house have MORE THAN ONE DEVICE and we can use any device at any time

3. How skilled do you see yourself in general when working on a computer?

Not at all confident	I'm trying	Coping fine	Quite good	Expert - I prefer to spend most of my free time on the computer

4. How confident are you at using a computer to do your school work?

Not at all	I try, but sometimes needs help	I am able to do everything on my own	I'm quite good and like to explore ways to use computers more in my schoolwork	I'm an expert and would prefer to do all my schoolwork on computer or another device

5. How often do you use the Internet to assist you in doing homework for various subjects?

Never	Rarely	When the assignment requires me to	A lot, especially to find out more about a subject	All the time. I cannot do schoolwork without the Internet

6. How often do you use information technology such as computers or other devices at school?

Never	Rarely	Only in computer class	A lot, in different classes	All of the time, in every class

7. How well do you understand Afrikaans in conversations?

Not at all	I understand some words, but not enough to follow the conversation	Although I don't understand ALL words, I am able to more or less follow the conversation	I understand most of the conversation, with only a few words that I am unsure about	I understand the entire conversation

8. How well do you understand Afrikaans when you have to read it?

Not at all. A dictionary doesn't even help	I am trying, but need a dictionary most of the time	I understand a lot and only sometimes need a dictionary to assist with difficult words	I understand most of what I read, but can't always answer the questions about what I've read	I understand everything, I don't need a dictionary and I am able to answer questions about what I have read

9. How confident are you when you have to learn complicated Afrikaans language rules?

Not confident at all. I usually give up	Trying, but need a lot of guidance	Coping fine. I understand, but make mistakes because I don't always apply the rules correctly	I am very confident. I rarely make mistakes	I'm an expert and NEVER make any mistakes

10. How much assistance do you need from you parents, tutors or other sources when you have to do Afrikaans homework or revision?

All of the time. I cannot do it on my own	A lot	Sometimes	Almost never, just with VERY difficult concepts	None at all

11. If you do need help with Afrikaans homework or revision at home, how available will that help be?

Never. There is no-one who can help me	Rarely. I (or my parents) have to go to great lengths to organise someone to help me.	When I need help, it is usually available, although sometimes I have to wait for a suitable time	When I really need help, I can get it easily	There is always someone who can help me

12. How often do you use the Internet to search for information and/or assistance when you have to do Afrikaans homework?

Never	Sometimes	Only when the assignment requires it and a website is provided	A lot. I use all the Internet resources that my teachers motivate me to use	All of the time. I have even found helpful Afrikaans sites on my own

7.10 Appendix H

Post-intervention survey

1. Were you able to do all the activities in the intervention?

Yes	No

2. Choose only ONE option to describe the intervention:

Fun	Boring	Difficult	Too long	Interesting	Helpful

3. Was the intervention easy to do on the computer?

No – I didn't understand the instructions	No – all the links did not work	Yes – the instructions were clear	Yes – it was very basic

4. Do you understand more about Direct and Indirect speech than before?

Yes	No	I'm not sure

5. Were there enough explanations?

No, I need more	Yes

6. Were there enough activities where you could practise what you've learned?

No	Yes

7. Which activity did you not like?

All	Be creative: Application of knowledge	Excel: Drill and practise	Listening comprehension: Video analyses and application	Sway: Video explanations, slideshows and mini-quizzes	None

8. Which activity was the most fun?

All	Be creative: Application of knowledge	Excel: Drill and practise	Listening comprehension: Video analyses and application	Sway: Video explanations, slideshows and mini-quizzes	None

9. Which activity did you struggle with most?

All	Be creative: Application of knowledge	Excel: Drill and practise	Listening comprehension: Video analyses and application	Sway: Video explanations, slideshows and mini-quizzes	None

10. Which activity was the most helpful to teach you about Direct and Indirect Speech?

All	Be creative: Application of knowledge	Excel: Drill and practise	Listening comprehension: Video analyses and application	Sway: Video explanations, slideshows and mini-quizzes	None

7.11 Appendix I

Interview questions

<u>The viability of computer-based interventions in Afrikaans First Additional Language teaching</u>

Before the intervention:

1. Were you more, or less motivated with the prospect of receiving intervention in Afrikaans FAL using computer technology instead of using worksheets or undergoing tutoring?
   a. Give possible reasons for your level of motivation.
   b. Mention and explain any possible anxiety or excitement about receiving the intervention, that you experienced before doing it.
      i. Were your feelings related to the technology or to the subject?

2. What used to be your perceptions of using computer technology to learn Afrikaans FAL?
   a. Explain the reasons for these perceptions.

During the intervention

3. Did you find the Afrikaans FAL intervention easy to execute on the computer?
   a. Were the instructions in the intervention clear? If not, elaborate on what you found vague.
   b. Which of the activities did you find most helpful? Explain your answer.
   c. Were there any activities that you found to be irrelevant in learning the specific outcome? If so, name them and explain why you felt it to be irrelevant.
   d. To which extent did the different levels of activities develop your cognition (understanding) of the concept of Direct and Indirect speech?

After the intervention

4. Do you understand the concept of Direct and Indirect speech better, or are you more confused after you've done the intervention on the computer?
   a. What did you find difficult in having to learn about Direct and Indirect speech using only computers?
   b. What did you find helpful in having to learn about Direct and Indirect speech using only computers?

5. Did your perceptions of using computers to gain more knowledge about Direct and Indirect speech change after you did the intervention? If so, explain your new perceptions.

6. What did you expect would be the results of completing the Afrikaans FAL intervention on Direct and Indirect speech with computer technology?
   a. In what ways did the results the you experienced after completing the intervention, meet, or not meet, your expectations?

Going forward

7. Would you like more, or less interventions in Afrikaans FAL like the one you participated in? Motivate.

8. What suggestions would you make to improve the intervention
   a. regarding Afrikaans FAL?
   b. regarding the use of computer technology?