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Experiences and attitudes of Setswana speaking teachers in using an indigenous African language on an online assessment platform

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Education in the 21st century must have a vision that will support and empower teachers to face the demands of the digital age. The use of information communication technology (ICT) in education can serve this end but ensuring access to digital resources will not address the digital disparity. Culture and language play an equally important role in exacerbating and maintaining the digital disparity as the traditional factor of access. In the study reported on here we investigated the experiences and attitudes of Setswana-speaking teachers in 3 primary schools in the North West province, South Africa, as they were exposed to online software in Setswana, an indigenous African language. Purposive sampling was used to select 7 teachers for the study. Two research questions were answered using systematic self-observation (SSO) instruments, the participant observation (PO) instrument and the in-depth interview (IDI) instrument to determine the experiences and attitudes of the teachers. Thematic analysis was used to analyse the interview data. It was found that accuracy of translation was key for adopting and using software in an African language. The teachers felt that English was the language of ICT and that African languages were not intellectual languages and did not have the capacity to be used in ICT. It is, therefore, recommended that more must be done to translate software into African languages and an effort must be made to raise the status of African languages in academic and technical fields.

Keywords: affordance; assessment; attitude, experience, indigenous languages; ICT; localisation; TARMII; translation; user interface

Introduction and Background to Study

The rapid growth of information communication technology (ICT) accompanied by its vast array of benefits have led to an increase in its use in various intervention programmes with the expectation that its use will fast-track development in developing countries and communities (Bagchi, 2005; Herselman & Britton, 2002). In South Africa, access to and knowledge of ICT have become determining factors allowing individuals to access information, knowledge and other essential facilities and services. However, Mapi, Dalvit and Terzoli (2008) argue that due to the vast inequalities in South African society, most marginalised communities and individuals will never fully benefit from ICT. This view is also held by Chen, Lin and Lai (2010), who note that an individual's acceptance and adoption of ICT is greatly influenced by contextual circumstances and experiences. Osborn (2010) expands on this argument by stating that the true potential of ICT to support and promote social, economic, and educational development can only be realised when ICT resources are adapted to meet the needs of the targeted local end-user population.

In 2006, the Human Sciences Research Council (HSRC) initiated what became a series of three studies on the use of ICT to support the formative assessment practices of South African teachers at schools in low socio-economic areas. Over the next 8 years, the three studies were conducted with the various iterations of the Teacher Assessment Resources for Monitoring and Improving Instruction (TARMII) software. The rationale behind the design of the TARMII concept was informed by the work of Anderson (2004), Day and Lloyd (2007), Gaver (1991) and Haines (2015), who note that since teachers have a limited or misguided understanding of the purpose and process of formative assessment, providing them with the necessary tools to support their assessment practices would allow them to focus on the diagnostic aspect of formative assessment.

The first study in 2009, saw the development of the first iteration of the software (TARMII 1.0), which was a compact-disc (CD) version of assessment software generator with an English user interface. In 2014, the second study and second iteration of the software (TARMII 2.0) was launched and was essentially a modification of the first version and consisted of a bank of literacy assessment items in South Africa's nine Indigenous African languages. In 2016, the third and final study and iteration of the software, TARMII 3.0, was developed. However, TARMII 3.0 differed greatly from TARMII 2.0 in that it was a fully online platform that allowed teachers to access the software from anywhere using any device (laptop, personal computer, smartphone or tablet) and that it allowed learners to take the test online on any device and have their responses machine marked with a series of diagnostic reports generated in real time. While the core design feature of all three iterations remained the same, technological and software advancements saw drastic improvements and modifications to the functionality of the software. Another feature that remained unchanged through all three iterations was the use of English as the default language of the Graphical User Interface (GUI). All three the studies focused on investigating the influence that the use of ICT has on the formative assessment practices of

teachers. Hence, the issue regarding the language of the user interface was not of interest in the larger scope of the study by the HSRC. However, during the second study (TARMII 2.0), researchers made notes on the general concerns raised by teachers, and one of the concerns raised was that the teachers experienced problems navigating the software. According to the teachers, some of the navigation buttons (commands, icons and tabs) on the user interface were difficult to follow as they were all by default in English. They also questioned why the software had assessment items in an indigenous language, yet the instructions to use those items to build an assessment were in English (Moodley, 2020).

This question regarding the interface language raised by the teachers was also identified in various pieces of literature as an impeding factor to access ICT (Keegan, 2008; Osborn, 2010; Prah, 2007). This led to the grounding of my Doctor of Philosophy (PhD) study within the context of the third iteration of the software (TARMII 3.0). I secured permission from the HSRC, United States Agency for International Development (USAID) and the DBE to modify the GUI of TARMII 3.0 to allow for the design and inclusion of a multilingual interface that would allow for the inclusion of all 11 official South African languages.

Nature of the Problem

According to Bagchi (2005) and Sein and Furuholt (2012), the introduction of ICT has benefitted humanity; however, Cancro (2016) and Omojola (2009) dispute this and argue that while the introduction of ICT may have benefitted some, it has served to widen the inequality between those who can access and engage with available ICT applications and those who cannot. To address this inequality, large multinationals and governments have invested large sums of capital to equip and provide access to ICT resources. However, Osborn (2010) argues that even with these large investments, the African continent will continue to lack access to ICT and will essentially be a consumer of technology rather than a producer of technology. As such, Africa and its people are forced to access and use ICT applications in a language that is alien to them. Looi, Sun, Seow and Chia (2014) and Osborn (2010) argue that for any ICT innovation to be accepted by an indigenous population, the application must accommodate the needs and context of that population. It is with this problem in mind that the localising of the TARMII 3.0 software was conceptualised.

Purpose of the Study

The purpose of this study was to investigate the experiences and attitudes of Setswana-speaking teachers when they had access to online assessment software in Setswana.

Research Questions

In the study we attempted to answer the following two research questions:

- 1) What are the experiences of the Setswana-speaking teachers when accessing and using the English version of the TARMII dual-language software as compared to the Setswana version?
- 2) How does exposure to the TARMII dual-language online assessment software influence the attitudes of Setswana-speaking teachers towards the use of indigenous African languages in ICT?

Literature Review

A few aspects need to be considered in the study of the localisation or adaptation of computer software into an indigenous African language. However, in the context of this study, five themes were identified as being relevant in grounding the discussions we intended to make around the localisation of computer software. These themes included African languages in the 21st century, status of African languages, indigenous African languages and information access, intellectualisation of indigenous African languages and benefits of ICT within the African context.

African languages in the 21st century

Of the almost 6,700 world languages, around 2,000 (30%) are spoken in Africa (Bamgbose, 2011), yet no African language dominates in the fields of education, economics, medicine, law or ICT.

The 1976 Soweto uprising that opposed the forced implementation of Afrikaans into the curriculum did not result in the promotion of indigenous African languages but rather saw the rise of English as a dominant and commonly used language (Mashiyi, 2011). In a post-1994 South Africa, numerous education and language policies based on the democratic constitutional framework were developed to ensure that indigenous African languages are recognised and their status elevated (Webb, 2002). However, for indigenous African languages to be competitive and contemporary in the 21st century, aspects of terminology development, interpreting and translation, language technology, and especially, corpus planning in the digital age must be prioritised (Ngcobo, 2007).

The most ardent advocates for incorporating indigenous languages into ICT acknowledge that the greatest barrier is the equivalence in translation of technical terminologies (Keegan, 2008; Looi et al., 2014; Osborn, 2010). However, Moodley (2020) argues that the process of localising software should not be impeded by the lack of context-appropriate words in the indigenous language, but rather that technical terms that cannot be translated into an indigenous language should be left in the default language (English) on the GUI. The end-user, who is a first language speaker, could then in collaboration with the translators and software developers serve as a partner to

collaboratively translate the technical terms into an indigenous language. This approach was also advocated by Khumalo (2017:262), who argues that “terminology development should not be exclusively a top-down and selective process where discipline experts, terminologists, lexicographers and linguists decide on translations of words or phrases that are not commonly used in their ecosystems, but that rather the process must embrace a bottom-up approach through crowdsourcing.”

Status of African languages

According to Bambose (2011), the 1885 Berlin Conference banned the European slave trade, while at the same time encouraged European nations to colonise and exploit Africa’s human and natural resources. The process of colonisation ultimately contributed to the growth and dominance of colonial languages in Africa. Ebataamehi (2020) notes that only 10 of the 54 African countries use indigenous African languages as official languages, and from these 10 countries the ex-colonial languages still have a higher status and dominance over the indigenous languages (Wanjiru, 2020). Alexander (1999) notes that in South Africa the nine indigenous African languages are numerically superior, but English, which is spoken by a minority, holds dominance over the indigenous African languages. While there is a perception that indigenous African languages in South Africa hold a low status for use in specialised fields, Africans need to acknowledge that African cultural knowledge and language must occupy a high status. It is only when this is attained that the emotional, intellectual, and spiritual needs of the African people will be addressed (Ndimande-Hlongwa & Ndebele, 2017; Van der Westhuizen, Greuel & Beukes, 2017). As such, it becomes imperative that steps and decisions be taken to promote the status and prominence of African languages in the 21st century.

Indigenous African languages and information access

The Constitution of the Republic of South Africa, 1996 (Republic of South Africa, 1996) (hereafter referred to as the Constitution) is the foundation of our democracy and Section 32(1) of the Constitution seeks to ensure that every citizen has the right to access to any piece of information collected by the state as well as any information held in the public domain. A 2018 Organisation for Economic Co-operation and Development (OECD) report notes that by providing access to information, citizens are empowered to make the correct decisions, which ultimately supports their contribution and participation in the democratic governance of a country. Moodley (2020:42) notes

that within the South African context “access to information has an unwritten ‘Right of Admission’ proviso, which is dictated to by language.” Similarly, Omojola (2009) indicates that for most South Africans engaging and accessing information in the digital space will be a challenge as most speak an indigenous African language. Proficiency in English is a prerequisite for accessing information as most digital resources and platforms exist only in English. Bodomo (1996), Gudhlanga and Makaudze (2012) and Khan (2014) expand on this argument and maintain that the success and sustainability of any social development or ICT intervention programme in Africa stands the risk of failure if the programmes are not contextually or culturally appropriate to the target users within the African context.

Intellectualisation of indigenous African languages

According to Adegoju (2013) and Miti (2017), the use of ex-colonial languages in all aspects of African society has impeded the educational progress of most of Africa’s population while also ensuring Africa’s reliance on ex-colonial countries and their languages. It is then imperative that there will be intensive and in-depth discussions and programmes to develop terminology and content in indigenous African languages in modern technical fields like ICT (Mapi et al., 2008). Language modernity is not achieved through the birth of new terms but rather through everyday discourse.

Achieving language modernity is easier for dominant languages due to their solid linguistic foundation, while weaker indigenous languages must accept the information and solutions produced in dominant languages like English (Nürnberg, 2012). This state also exists in ICT, where indigenous African language speakers have no choice but to use software in English, as no digital material exists in an African language (Osborn, 2010). Furthermore, Prah (2007) argues that the languages used in ICT must be languages that all Africans are comfortable using. As a result, Finlayson and Madiba (2002) and Khumalo (2017), suggest that for African languages to function effectively in a technology-focused environment, the African languages must go through the process of language intellectualisation and modernisation, which occurs through terminology development. According to Alexander (2003) and Lusekelo (2018), the process of language modernisation starts from terminology development, which includes the borrowing or translation of words and terms from other languages; this process also takes place among the world’s dominant languages. Hence, Adegoju (2013) states that the intellectualising and modernisation of African languages will ensure access to digital knowledge and information to Africa’s population.

Benefits of ICT within the African context

According to Wertlen (2008), the Millennium Development Goals identified ICT to fast-track development in developing countries. This resulted in many governments introducing ICT focused intervention programmes to drive development. However, the adoption and use of ICT within these interventions was not a simple process, and within the South African educational context various projects like Gauteng Online, Khanya Project and Computers for Africa showed that teachers' acceptance and adoption of ICT was slow and conservative (Staff Writer, 2013). Conole and Dyke (2004) and Mdlongwa (2012) explain that the slow uptake was because of a lack of understanding and appreciation of the benefits of the available ICT resources by teachers. However, Moodley (2020) disputes this and states that while many teachers understand the benefits of ICT, certain design features of the software may influence or dissuade teachers from using the ICT resources. Within the South African context, teachers who speak indigenous African languages are confronted with an abundance of digital information, and yet, the design of the ICT platforms is problematic as English serves as the default language, which is not the first language of teachers who speak indigenous African languages (Deb, 2014; Moodley, 2020). Prah (2007) identifies language as being pivotal in the transmission and reception of information and notes that an individual who is not proficient in the language of the webpage, experiences a condition of information and knowledge restriction. Conole and Dyke (2004) state that the restrictions found within digital resources is due to contextual or individual circumstances.

Osborn (2010) notes that to ensure that every person has access to ICT, it is imperative that all barriers to ICT access or restrictions, which include language and culture, be addressed through contextualised software design and development. Martín, Mazalu and Cechich (2010) also insist that factors such as language, culture, geographic location, and users' capabilities must be considered in ICT resource design so that the needs of individuals are met. Within the framework of this argument, it becomes apparent that ICT resources and platforms within the South African educational context must be conceptualised, redesigned, and localised to accommodate indigenous African languages (Fuchs & Horak, 2008).

Research Methodology

At the core of this study is the TARMII 3.0 software. In preparation for the study, the GUI of the TARMII 3.0 software was modified to include the various indigenous African languages and Afrikaans. However, due to the complexity of the process of localisation, it was decided to include only a single indigenous African language onto the

multilingual online platform. The North West province was selected as the study province and Setswana, the dominant language in the province, was chosen as the single language that would be used on the TARMII 3.0 software.

Research Design

There is little or no empirical research within the South African context in the field of software localisation, which is the use of an indigenous African language as the default language of the GUI of a digital educational resource (Mapi et al., 2008; Wallach & Scholz, 2012). In this study we used a qualitative research approach because it is flexible and allows the research team to interact and engage personally with the participants as they experienced first-hand the English and Setswana GUI of the TARMII 3.0 software in their natural settings. This allowed for rich, contextually-based, and generally unstructured and non-numeric data to be collected.

Study Sample

Participants for this study were purposively selected to meet specific criteria to allow for the collection of useful data. The selection criteria required a participant to be: (1) a Setswana home-language speaker, (2) ICT literate, (3) a Grade 3 teacher, and (4) located within a specific geographical district in the North West province. The eventual sample comprised of seven Grade 3 teachers, of which two were Heads of Department and five were level-one teachers. Five of the participants had more than 20 years' teaching experience and the remaining two had more than 5 years' teaching experience.

Ethical clearance to conduct the study was obtained from the North West Provincial Education Department, the University of the Witwatersrand's School of Education's ethics panel. Participating school principals and participants completed the relevant consent and declaration forms. The consent forms informed the participants that they had the right to withdraw from the study at any time, and that no private details would be used in the final research report and published documents. Pseudonyms were used to protect the identities of the participants and the schools.

Data Collection and Instruments

The data collection occurred in two stages. The first stage was introducing the participants to the English GUI of the software, while the second introduced them to the Setswana GUI. In each stage, three data collection instruments were administered, namely the SSO instrument, the PO instrument and the IDI instrument.

In the first stage of data collection, each participant was given access to the online English version of the software and were required to

complete 27 activities specified in the SSO. These activities were grouped into the four key aspects of the software as reflected in Figure 1. The 27 activities in the SSO instrument required the

participants to complete each activity and then self-rate their ease-of-use experience for each activity on a rating scale where 1 was *very difficult* and 7 *very easy*.

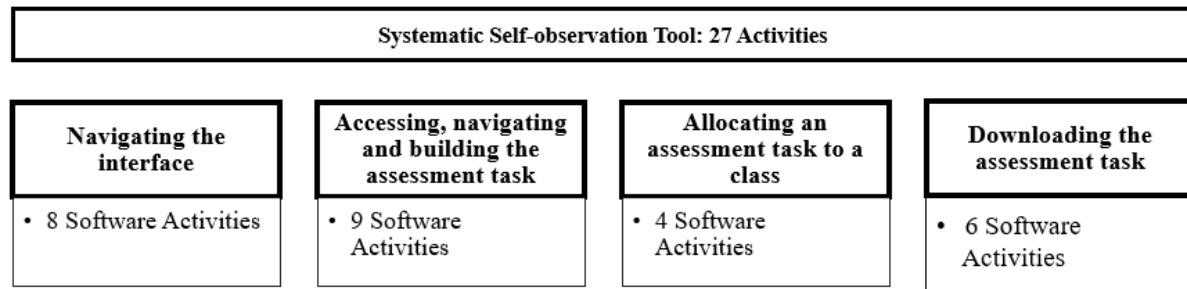


Figure 1 SSO activities

While the participants were completing the 27 activities, they were observed by a researcher who recorded their observations on the PO instrument. The PO instrument was designed so that the researchers would record text notes based on the same four key aspects used in the SSO.

The IDI instrument was administered after the SSO and PO instruments were completed. The IDI instrument comprised of 21 questions. Twelve of the questions were biographical questions that helped create a unique personal and ICT background profile for each participant, and the remaining nine questions focused on the participants' experiences as they used both the English and Setswana versions of the GUI of the TARMII 3.0 software. The IDI data collection process was audio recorded to ensure accuracy of data. The entire process of administering the three instruments was repeated in the second stage that focused on the participants' use and experiences of the Setswana GUI of the software.

In this article we focus only on the data collected from the IDI instrument as the data from the IDI instrument relate directly to the experiences and attitudes of the participants.

Data Preparation

The preparation of the IDI data started with the downloading of all 14 audio files (seven English and seven Setswana) from the various devices. Each audio file was uploaded onto a secured server at the HSRC offices in Pretoria. The audio files were then transcribed by an external transcription company. As the last stage of data preparation, each participant's transcript was divided per question and all the same question responses were grouped into a single document in preparation for analysis.

Data Analysis

The unique nature of this study required using an analysis approach that would reveal the richness

and depth of the data so that the relationship between the teachers and their interaction with a unique piece of software could be revealed. The analysis of the data included the analysis of the English and Setswana data sets for each of the three instruments. The six stages in Braun and Clarke's (2006) model of thematic analysis were used to analyse the IDI data. These stages included data familiarisation, data coding, generating themes from the coded data, reviewing the themes, defining and naming themes and finally writing up the analysis of the data. The following central themes were identified: GUI translation; influence of restrictions on ICT access; affordance of system functionality; and contextual adaptation (Pholotho & Mtsweni, 2016).

Study Findings and Discussions

ICTs have the necessary functionalities to fast-track progress within developing countries. However, Thapa and Hatakka (2017) argue that the introduction of ICT is not achieving its intended outcome, and in many instances resulted in developing countries lagging further behind developed countries. This raises the question why ICT resources can be successful in some contexts and unsuccessful in others. This variation in success could be explained using the concept of restriction as defined by Conole and Dyke (2004). To summarise, Conole and Dyke (2004) identified restrictions pertaining to individuals using an ICT resource, and according to them, restrictions can be context or circumstance bound. Fuchs and Horak (2008) and Osborn (2010) expanded on the concept of restriction and identified language as a possible restrictor when it comes to the acceptance and use of ICT in developing countries.

The findings and discussion section are centred around the two research questions which relate to the experiences and attitudes of the participants as they engage with the dual language TARMII software.

Research Question One

What are the experiences of the Setswana-speaking teachers when accessing and using the English version of the TARMII dual-language software as compared to the Setswana version?

In the context of this question, the emphasis was on comparing the experiences of the participants as they engaged with and used the English and Setswana versions of the software. Overall, the participants found navigating and accessing the interface for both language versions easy. As the data showed, the participants found the commands and the user interface user friendly. According to participants Thandi and Molly, the navigation of the interface was very easy and essentially the commands were self-explanatory and easy to remember. However, when it came to comparing the experiences of the participants using the Setswana and English versions, the findings showed mixed responses. Participant Molly made the following statement regarding her experience using the Setswana version, “*it's not difficult to access it. I found things easier since it is my language, the Tswana part that is a big thing. A big solution according to me.*”

The participant’s positive experience of using the Setswana version was also echoed by participant Elize who indicated that it felt natural for her to use the Setswana version simply because, “*it is my first language, the language I first experienced as a child.*” This sense of comfort and security in using the software, alluded to by the participants, is a critical aspect when attempting to understand the concept of technology acceptance and use. These findings are supported by the work of Lopez, Gonzalez-Barrera and Patten (2013) and Osborn (2010), who comment that an ICT tool is not a tool unless the end-user perceives its affordance, and with the affordance comes the ease of use of the ICT tool. Furthermore, the quality of the translation of the user interface played a critical role in its acceptance; this was highlighted in the findings when multiple participants indicated that the navigation of the software was made easier due to the accuracy of translation of the interface commands. Participant Elize also emphasised the need for accurate translations and reiterated that accurate translations would promote the use of indigenous languages in ICT. The importance of accurate translations was also cited by Rosen and Purinton (2004), who linked accuracy of the translated terms to ease of use of the software, while Prah (2007) and Rike (2008), emphasised that accurate translations into an indigenous language will promote access and adoption.

The need for the translation of digital material and resources into indigenous languages is essential for the growth and development of an indigenous language in the 21st century. Within the South African context, a high number of potential web

users are non-English speaking, and as such, there is a need for the development of appropriate terms in indigenous languages in the domain of ICT (Ahmed, Mouratidis & Preston, 2008; Martín et al., 2010). However, the process of translation is not a simple and straight forward one. According to Roturier and Lehmann (2009), translating technical terms into indigenous African languages can be problematic in that all terms may not have an equivalent in an indigenous language, and this can result in some resistance to using the translated software. This view is evident from the findings when participant Rebecca noted with concern during the interview that some of the computer technical terms in the TARMII software were not translated into Setswana. She thus argued, “*The Setswana terms will sometimes be difficult to translate, we will find it difficult to get them, they should stay in English.*” An interesting view was offered by participant Thandi, who had earlier indicated her satisfaction with the quality of translation, but now noted that she would rather use the English version of the software. She remarked, “*I would go for English because some of the terms you couldn't find in Setswana. It will be something new.*”

The lack of the appropriate terms in the indigenous language posed a problem, which is highlighted by Keegan (2008) and Looi et al. (2014) who maintain that the lack of technical terminologies in indigenous or marginalised languages affects the process of software localisation. Participant Thandi further suggested that teachers could aid in translating terms that were left in English in the TARMII software, as they were first language Setswana speakers. She suggested, “*You could put a box that we could suggest our ideas for those words you couldn't translate. We could have come up with ideas.*” This suggestion was proposed by Khumalo (2017), who noted that the lack of technical terms in an indigenous language should not halt any process and that crowdsourcing could be used to implement the process of terminology development, which is exactly what Thandi suggested during the interview.

Other interesting findings included participant Evelyn who indicated that when she used the Setswana version, she would first mentally translate the Setswana term to English and then, based on the mental translation, would navigate the software. This approach to engaging with the software was also cited by participant Jose, who said, “*I looked at the Setswana commands and then thought in English, then I pressed the button.*” An additional finding included participant Lydia, who noted that she lacked confidence working on the TARMII software, which she attributed to the lack of practice and access to ICT resources, which was as a result of the perception that Foundation Phase

teachers did not need to have access to or use ICT for teaching and learning.

Research Question Two

How does exposure to the TARMII dual-language online assessment software influence the attitudes of Setswana-speaking teachers towards the use of indigenous African languages in ICT?

In the context of this question, the emphasis was on how the participants' exposure to a Setswana version software influenced their attitudes towards the use of indigenous African languages in ICT. According to Khumalo (2017) and Prah (2007), indigenous African languages have always been viewed as being inferior to Western or ex-colonial languages as they were perceived to be incapable of holding their own in technical and specialist fields. This widely held perception has greatly influenced the attitude of many who speak indigenous African languages. The participants viewed the Setswana software as an invaluable resource that would provide them with access to content material in Setswana. This was evident when Jane, one of the two Heads of Department, acknowledged that the software would allow her to easily find Setswana resources, and commented: "*You don't have to go and page in the books to look for Setswana activities, so it's easier for us to get the activities timeously.*" Participant Jose also elaborated on this point, by confirming that "*ICT can make our work easier now, there is so much that we can get from this software, I can now print out tests in Setswana, I don't have to sit for hours setting tests, I am so happy.*" From these comments it becomes evident that the participants now viewed the Setswana software as an advantage.

As noted by Bamgbose (2011) and Prah (2007), the availability of resources in an indigenous language would not only provide users with additional resources, but will also improve the status and standing of the indigenous language.

So, while some participants viewed the Setswana software as a source of additional enriched content, others regarded the Setswana software as a saviour. Participant Lydia suggested that the TARMII software could serve to support learners with learning difficulties and said: "*I will be able to get the Setswana things. So, at least those who have learning barriers they will be able to have something also.*" Lydia's argument was essentially that learners with learning difficulties had no option but to use remedial material in English, however, with Setswana software, they could support their learners with first-language resources. Gibson (1979, cited in Boyle & Cook, 2004) notes that the physical reality of any device or object will not carry a common meaning to all people, but rather the meaning can and will be discovered by every individual's need – which is

apparent when we look at participants Lydia's and Jose's views and attitudes towards the software.

Within the study context, the participants were located at schools that were geographically far apart. Participants Elize and Lydia commented on their satisfaction of having online software in Setswana and that the software would allow them to share Setswana content with colleagues in far-off locations. Lydia further explained: "*see other assessments done in Setswana, and then we can share the challenging ones. We can share from Brits to Mogwase.ⁱ It will help us.*" It becomes apparent from these comments that the participants' attitudes towards the TARMII software was greatly influenced by the benefits it provided them.

The ease with which the participants navigated the Setswana version of the software greatly influenced not only their acceptance and use of the software, but also their attitudes towards the use of Setswana as a language of ICT, and ultimately the place of indigenous languages in the domain of ICT.

Summary of Findings

The aim of this study was to investigate the experiences and attitudes of Setswana-speaking teachers as they were exposed to a Setswana online version of the TARMII software. The study delivered two key findings. The first relates to the quality of the translation, and the importance of accuracy for the interface to be effectively localised into an indigenous language. The data show that the teachers were generally satisfied with the quality of the Setswana translation of the TARMII GUI. However, some teachers thought that using English for software was a better option as they regarded English as the language of technology and progress. Their scepticism was based on the inability of Setswana to accommodate technical terminologies. It was also suggested that as teachers and first-language speakers, they could, in the future, play a role in the translation of computer interfaces.

The second key finding is directly related to the concept of affordance that both the English and Setswana versions of the software offered. In both versions, the question bank facility offered multiple solutions by serving as a question resource and an automated test builder to build quality tests. With regard to the Setswana version of the software, the teachers viewed it as a facility offering many resources in Setswana. From their responses it seems as though they lacked learning resources in Setswana, and as a result, the Setswana version of the TARMII software was a perfect tool that would allow them access to quality questions and reading passages in Setswana.

These preliminary findings show that providing teachers in South Africa with educational software in an indigenous African language is

advantageous. However, their belief that English is more appropriate for use in the 21st century due to indigenous languages lacking modernity, greatly stifles the drive and ambition of government policies to promote the use of indigenous African languages in mainstream subjects like ICT. As a result, the implementation of policies and reports like the 1996 Language Plan Task Group, the 2003 National Language Policy Framework of the Department of Arts and Culture, and the 2004 White Paper on e-Education (Department of Education, RSA, 2004), of which all focused on the adaptation and development of material and digital resources into indigenous languages, was not realised.

Limitations

As stated earlier, this study was one of few empirical studies conducted in a South African educational context that introduced a localised version of educational software. As a result, there was no yardstick against which to measure the findings. The first limitation experienced in this study was that a larger sample of participants would have been better because it would have provided deeper and richer data. The second limitation was that the study was restricted to one indigenous African language; the inclusion of multiple indigenous languages would probably have yielded more interesting findings.

Conclusion

The need to promote the status of indigenous African languages has been driven through acts and policies of Government, which were formulated at the birth of South Africa's democracy, however, the enactment of these policies has not been effective. The explosion of ICT and its advantages cannot be refuted, and access to ICT should be a basic human right. As the drive for social and economic inclusivity strengthens, so too is there a need for inclusivity within the digital space. The design and development of digital sources, content and platforms no longer depends on technology-savvy individuals or content experts. As we strive for digital inclusivity, multiple factors need to be considered during the conceptualisation, design and development of any digital resource (Osborn, 2010). What this study we attempted to investigate how exposure to online educational software with a Setswana and English user interface would influence the experiences and attitudes of the teacher participants towards the use of an indigenous African language in ICT. From the data collected, it became apparent that accuracy of translation of the software was central to technology acceptance by speakers of indigenous languages (Rike, 2008). Furthermore, we also noted that while speakers of indigenous languages were proud and excited to see their language being

used in the digital space, the perception that English was the preferred language of ICT still lingered. However, the use of Setswana in the software also created a situation resulting in participants changing their attitudes towards the status of Setswana, and now regarded it as a language that could support and bring people together.

Authors' Contributions

MM wrote the manuscript, with RD consolidating the literature review, the summary, and the conclusion. MM conducted the interviews. Both authors reviewed the final manuscript.

Notes

- i. These are two towns in the North West province that are some distance apart.
- ii. Published under a Creative Commons Attribution Licence.
- iii. DATES: Received: 10 March 2021; Revised: 9 July 2021; Accepted: 4 August 2021; Published: 31 October 2021.

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