

Promoting Indigenous African Languages Through Information and Communication Technology Localisation: A Language Management Approach

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Abstract

The integration of information and communication technology (ICT) and indigenous African languages in South African institutions of higher learning is an important and strategic imperative that should be adopted and embraced. Given the spread of ICT, its increased access and a variety of opportunities that it offers, such an initiative has the potential of impacting positively on the promotion and intellectualisation of these languages. This study thus seeks firstly, to discuss language problems that are associated with the low profile of indigenous African languages in higher education. Secondly, the paper explores the various opportunities in ICT that could be instrumental in the promotion of these languages. Finally, the paper discusses the possible challenges of integrating ICT and indigenous African languages into ICT. The language management theory (LMT) provided a theoretical foundation for the study. Two other theories were also used to complement the LMT namely the Contextualise, Apply, Transfer and Import framework and the model of localisation ecology given the inter-disciplinary nature of the study. Methodologically, an ethnographic approach was adopted in which semi-structured interviews and document review was used to collect data. The study established various language problems that contribute to the continued low profile of indigenous languages, among them, the limited utilisation of these languages as languages of teaching and learning, lack of documentation, negative attitudes, monolingualism, and orthographic inconsistencies. ICT opportunities that are available for the promotion of these languages national corpus development, the development human

language technologies software and web content localisation. The study also established the lack of expertise and collaboration among language and ICT experts, a lack of coherence between language and ICT policies, a lack of financial resources, large volumes of content to be localised, and the challenge of sustaining localised ICT products, as possible challenges of such an initiative.

Keywords: Indigenous African languages; Information and Communication Technology; Language management; Localisation

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Isifingqo

Ukuhlalana kolwazi nobuchwepheshe bokuxhumana (ICT) kanye nezilimi zesintu zase-Afrika ezikhungweni zemfundo ephakeme kuyisinyathelo kanye nesu elibalulekile okufanele licatshangwe futhi lamukelwe. Uma kubhekwa ukusabalala kwe-ICT, amazinga engeziwe enani labantu abayisebenzisayo kanye namathuba amaningi avela ekusebenziseni i-ICT, kuliqiniso ukuthi lesi sinyathelo singaba nomthelela omuhle kakhulu ekuthuthukiseni nasekusetshenzisweni kwezilimi zesintu. Ucwangingo lolu-ke luhlose, kuqala, ukuxoxa kabanzi izinkinga zolimi ezidala ukungathuthuki nokubukelwa phansi kwezilimi zesintu ezikhungweni zemfundo ephakeme. Okwesibili, luhlose ukuveza amathuba angavela ekuhlanganisweni kwe-ICT nezilimi zesintu kuzikhungo zemfundo ephakame. Ucwangingo lolu luhlose futhi ukuveza izingqinamba ezingaba khona kulesi sinyathelo sokuhlanganisa izilimi zesintu neICT. Injulalwazi yokongamela ulimi (LMT) isetshenziswe njengenjulalwazi emqoka kulolucwangingo kwathi-ke ezinye izinjulalwazi ezimbili i-Contextualise, Apply, Transfere and Import (CATI) kanye nemodeli ye-localisation ecology zasetshenziwa ukweseka i-LMT ngenxa yobumbaxambili bemikhakha yalolu cwaningo. Kusetshenziswe i-ethnography njengendlela yokuqhuba ucwangingo, izingxoxo kanye nokubuyiswa kwemibhalo kwaba indlela zokuqoqa ulwazi. Ucwangingo lolu

luthole ukuthi ziningi izinkinga ezidala ukuthi izilimi zesintu zibukelwe phansi ezikhungweni zemfundo ephakeme. Ezinye zalezi nkinga amazanga aphantsi okusetshenziswa kwalezi zilimi njengezilimi zokufunda nokufundisa, ukusilela kwemibhalo ebhalwe ngalezi zilimi, imiqondosimo engemihle ngezilimi zesintu, ubuliminye kanye nezindlela ezingahlelekanga zokubhala izilimi lezi. Ucwangingo lolu luthole ukuthi amanye amathuba okuthuthukisa izilimi zesintu ngokuzihlanganisa ne-ICT ukwakhiwa kwekhophasi kazwelonke yezilimi zesintu, ukwakhiwa kobucwepheshe bolimi olukhulunywa ngabantu, ukufaka kwezilimi zesintu ekwakhiweni kwama-software kanye nokufaka ulwazi olubhalwe ngesintu ku-inthanethi. Ucwangingo lolu luveze futhi ukuthi ukusilela kolwazi lobungcweti bokuhlanganisa izilimi zesintu ne-ICT nokungasebenzisani ndawonye, ukungahambisani kwenqubomgomo yezilimi kanye neye-ICT, ukusilela kwezimali zokuxhasa imizamo enjena, ulwazi oluningi oludinga ukuhunyushwa kanye nezinkinga zokuqhuba phambili imikhiqizo ye-ICT esihlanganiswe nezilimi zesintu izinquinamba ezingaba khona emizamweni yokuhlanganisa ulwazi nobuchwepheshe bokuxhumana kanye nezilimi zesintu.

1. Introduction

It is imperative for institutions of higher learning to consider embracing the strategic use of African languages alongside ICT. Such initiatives are set to ensure a positive bearing in complementing other interventions destined towards the promotion of African languages, which have suffered marginalisation for a number of years dating back to the era of colonisation. Despite the advent of a democratic society in South Africa, coupled with progressive legislative framework such as the democratic constitution (Republic of South Africa 1996), the National Language Policy Framework (Department of Arts and Culture 2003), the Language Policy for Higher Education (Department of Higher Education 2002); the Ministerial Committee Report on Transformation and Social Cohesion and the Elimination of Discrimination in Public Higher Education Institutions (Department of education, 2008), the Green Paper on Post-Secondary School Education and Training (Department of Higher Education and Training 2012) , among others, that seek to promote African languages, these languages are still lagging behind in terms of their development and usage in advanced

fields of life that may include South African higher education, science and technology, the economy and governmental processes, among others. English continues to dominate in these domains to the detriment of African indigenous linguistic heritage. Although institutions of higher learning in particular have come up with multilingual language policies, the implementation of these policies remains a major challenge for some and a 'pipe dream' for others. The potential of Africa's indigenous linguistic heritage within the ICT domain should not be underestimated given the spread and impact of ICT within the South African community, the rich socio-linguistic history of the country and the multilingual diversity, which is reflected in the student populations of South African higher education institutions.

2. Background Information

Several ventures have been witnessed in South Africa and abroad in an effort to empower African languages. In Africa and abroad, most of these efforts have been accomplished through the activities of the United Nations and the African Union (AU) (previously known as the Organisation of African Union) in the form of resolutions, charters and plans of action. Examples of these include, among others, the Language Plan of Action for Africa (OAU 1986); The Harare Declaration (UNESCO and OAU 1997); The Asmara Declaration (Asmara Declaration 2000); Charter for the Promotion of African Languages in Education (OAU 1996); and The UN Declaration on the Rights of Indigenous People, Article 13 & 14 (United Nations 2007). There has also been the founding of organisations that are committed to addressing this predicament. Examples include organisations such as UNESCO, the OAU Bureau of Languages in Uganda, the Centre of linguistic and historical studies through Oral tradition (CELHTO) in Niger and the Regional Centre of Documentation on Oral Traditions and African languages (CERDOTOLA) in Cameroon, the African Academy of Languages (ACALAN) and the Open Society Initiative for Southern Africa (OSISA).

Within the South African context, the advancement of indigenous African languages has also been witnessed mainly through the activities of the Department of Arts and Culture and the Pan South African Language Board, among others. The elevation of African languages in higher education in particular is derived from several national policy documents that have been

produced since the beginning of the debate around the language question in South Africa. The National Language Policy Framework (Department of Arts and Culture 2003) is one of the major documents that obligate different government departments to a ‘multilingual mode of operation’ (Mesthrie 2006:153). Other national imperatives include the South African constitution (Republic of South Africa 1996); the Higher Education Act of 1997; the Language Policy for Higher Education (Department of Education 2002); the Ministerial Committee Report on the Development of Indigenous Languages as Mediums of Instruction in Higher Education (Ministerial Committee 2005); and the Ministerial Committee Report on Transformation and Social Cohesion and the Elimination of Discrimination in Public Higher Education Institutions (Department of Education 2008).

These policy documents advocate, among other things, for the promotion of Africa’s indigenous linguistic heritage and its function as the language of teaching and learning in the higher education context as well as the establishment of language policies, guided by the Constitution (Republic of South Africa) and the Language Policy for Higher Education (Department of Education 2003). Most universities in the democratic era have come up with their own language policies which reflect their commitment towards the elevation and intellectualization of the previously disadvantaged indigenous languages in this particular domain. In this paper, it is argued that the integration of information and communication technology within South Africa’s multilingual context would be of pronounced significance in facilitating the growth of indigenous African languages. According to Osborn (2010), the production and dissemination of local content in the web is virtually impossible in the absence of adequate ICT utilisation alongside the local linguistic heritage. Multilingual diversity, the emergence of an information revolution worldwide and the presence of the new ICTs in Africa justifies the increasing necessity of embracing the use of different indigenous African languages and presents an opportunity to utilise the linguistic treasure of Africa for education and development (Osborn 2010).

3. Literature Review

South Africa’s democratic constitutional framework prioritises the growth of previously disadvantaged indigenous local languages and further recommends positive and practical initiatives to be employed by the

government to enable the promotion of indigenous African languages (Beukes 2009). Kamwendo (2006), while acknowledging slow progress with regards to language policy implementation within the African continent, argues that the South African language policy on paper is remarkably compliant to the 'Language Plan of Action' crafted by the OAU. True to its democratic ideals, South Africa has established a remarkable variety of language planning and implementation bodies. One of the most eminent is the Language Plan Task Group (LANGTAG), whose role was to urgently provide advice to the concerned ministry on a viable plan of action with regards to the official languages of the Republic (LANGTAG 1996). Another important body is the 'Pan South African Language Board' (PANSALB) whose mandate was to function as an independent statutory body in the provision of advice to the provincial and national government on issues relating to language regulation and implementation. There is also the 'National Language Services' (NLS) under the 'Department of Arts and Culture' whose role is the provision of language services at local, provincial and national government levels.

The implementation of Language-in-Education policies, in particular, has experienced lack of progress since the new constitutional dispensation in 1994. Heugh (2006) asserts that the government is blamed for slowing down and stalling progress in implementing the 'language in education policy' that is potentially empowering. He adds that this failure has had disadvantageous effects on the achievement of many African languages' L1 learners within the education system and further propagates minimal literateness. Disappointingly, just like the apartheid educational policies, the employment of the above mentioned languages as mediums of facilitating learning and teaching is continuously being restricted to disadvantaged schools in the rural areas and townships (Lafon 2008). Research evidence derived from vast local, regional and international educational studies reveals that mother tongue education commands an enormous amount of potential which is convincingly unquestionable. It has also been argued that knowledge on subject matter in a primary language and literacy can be promoted through the implementation of strategies that promote bilingualism and multilingualism (Cummings 2000). It is further asserted that mother tongue education preserves the indigenous languages and improves the quality of education as it is usually acquired in the early years of childhood and

eventually becomes an instrument of thought and communication (Kamwangamalu 2000).

A study on the language attitudes of isiXhosa-speaking university students at the University of Fort Hare revealed that while the dominance of the English language is acknowledged in the South African education system, isiXhosa can play a significant role as an additional medium of instruction (Dalvit & De Klerk 2005). On a similar note, a study conducted by MacKenzie (2009) in India revealed that while access to school has increased and enrolment rates are improving, the dropout and performance rates are alarmingly low because education is delivered in a foreign language that learners do not understand and thereby exposing those to unfamiliar cultural contexts. In Ghana, it is reported that the use of English classrooms creates anxiety among students and hinders effective participation (Opuku-Amakwa 2009). In addition, Singh-Ghuman (2002) states that Asian students in America achieve lower marks when compared to their white counterparts. He adds that some students do not perform to the best of their ability because of poor expression, reading and listening skills. However, a number of reasons motivate students to prefer English as opposed to their indigenous (mother tongue) languages. According to De Wet (2002), in his study conducted in South Africa, there are socio-linguistic issues that affect the choice of the English language over indigenous African languages as languages of Learning and Teaching, and these include science and technology, education, politics, trade and industry and cultural activities.

However, the lack of language policy implementation and the continued marginalisation of indigenous African languages could further account for their lack of usage in the ICT domain, despite an enormous amount of potential enshrined in such an initiative. In this regard, scholars have identified various factors that are associated with the lack of indigenous African languages within the ICT domain. Such factors include, among others, the digital divide, negative language attitudes towards African languages and the hegemony of the English language (Keniston 2004; Gudmundsdottir, 2010; Djite, 2008; Diki-Kidiri and Edema, 2003; Osborn, 2006). Regarding the digital divide, Osborn (2006) contends that this problem continues to be disputably more localised, as opposed to being bridged, as evidenced in ancient and deeper linguistic, social and economic boundaries at both local and national levels. Matula (2004) adds that ICT has been excluded within the developmental frameworks in a number of African

countries which is clearly evidenced by a lack of progressive ICT legislative framework.

Negative language attitudes, mostly inherited from the colonial legacy in Africa, contribute significantly to the marginalisation of indigenous African languages in ICT. It has been argued that colonialism eroded the role and importance of indigenous African languages in the continent, resulting in the view that these languages lack intellectual, economic and cultural value, and also pose a major hindrance to socio economic growth (Djite 2008). English and other western languages are the primary languages by which people globally access information and communication. This is endorsed not only by the speakers of English but also by African language speakers themselves (Maseko *et al.* 2010). Furthermore, the hegemony of the English language has it the status of a gate keeper to the use of ICT by members of disadvantaged communities, especially speakers of indigenous African languages (Dalvit 2010). In a study that was conducted by Diki-Kidiri and Edema (2003), of the 3000 websites they were able to access, very few used an African language as the language of communication. This study established that there is a substantial amount of internet sites about African languages though these normally possess minimal subject matter in the indigenous African languages. A bigger fraction of these websites contains sites concerning the indigenous African languages themselves, amongst which are instructional pages and online bilingual dictionaries (Diki-Kidiri & Edema 2003).

Given the purported instrumental role of information and communication technologies in the promotion of lifelong learning, curriculum transformation and innovation, breaking the digital divide, diverse participation and enhancing the quality of education (Kajee & Balfour 2011), it is important to consider integrating it with the indigenous African languages. In South Africa, most institutions of higher learning have adopted ICTs and they have become a feature of learning despite the fact that many students that gain access to university education still experience difficulties with other literacy skills such as writing, reading and listening (Balfour 2002). In addition, it is also argued that the ‘advantages and opportunities which ICT purportedly offer should not be exaggerated within the context of indigenous populations of Africa, most of which use ICT gadgets and applications that are built into languages alien to them’ (Omojola 2009:33).

Omojola (2009) further asserts that there is need to integrate African languages with ICT and the process should start with local initiatives in developing indigenous languages through the publishing of media content on the internet and this would play a significant role in developing responsiveness amongst ICT product designers. Further, this will motivate them to create technological products that accommodate indigenous African languages. Scholars have also concurred on the fact that integrating ICT and indigenous African languages within the education context is significant as far as dealing with the past linguistic and social prejudices, is concerned (Gudmundsdottir 2010; Dalvit 2010). According to Gudmundsdottir (2010), language challenges maintain inequalities associated with access to ICT among socially disadvantaged learners; hence the importance of an appropriate and culturally profound approach whose basis is on capacity and the local needs of the people. In addition, Dalvit (2010) maintains that the integration of African languages and ICT in education is a primary phase in addressing linguistic inequality between the indigenous African languages and the English language, on one hand, and the social inequality of language users, on the other.

4. Objectives of the Study

- To investigate the language problems associated with the low profile of indigenous African languages in South African higher education.
- To explore the various opportunities available for the integration of ICT and indigenous African languages.
- To discuss the challenges of integrating ICT and the indigenous African languages.

5. Research Methodology

The study is situated within the interpretive research paradigm. Ethnography was employed as the research design for the study. The main objective of an ethnographic researcher is to present a detailed and holistic understanding of

individuals' perceptions, behaviour and their setting through the use of various data collection methods such as in-depth interviews, observations and documentary sources (Crowley-Henry 2009; Reeves *et al.* 2008). Two major data collection methods were employed namely semi-structured interviews and document review. Semi-structured interviews, which constituted the primary data collection method, were targeted at language practitioners in different South African higher education institutions. These were practitioners who have been involved in projects relating to the promotion of indigenous African languages. Nine key informants were interviewed in this regard. These interviews provided views on language problems associated with the low status of indigenous African languages in South African higher education, the various ICT opportunities that could be adopted for the promotion of indigenous African languages and finally the possible challenges of such an initiative. Documentary sources supplemented semi-structured interviews; the documents provided insight into the nature of the ICT challenges that had been discussed by the participants. Information on various initiatives that relate to the integration of ICT and indigenous African languages in various South African higher education institutions and other organisations was sourced from the documents as well. Documentary sources included journal articles that provide information regarding selected ICT products, institutional websites and project reports that are related to the phenomenon under investigation.

6. Theoretical Framework

The study is located within three complementary frameworks. The language management theory (LMT) has been employed as a backbone theory of the study. Two other frameworks namely the Contextualise, Apply, Transfer and Import framework (CATI) and the model of localisation ecology have been employed as supplementary frameworks in view of the inter-disciplinary nature of this particular study.

The foundation of the LMT is linked to the development of the language planning theory in the early 60s and 70s, and has been associated with scholars such as Neustupny (1978), Jernudd and Neustupny (1987), among others. According to the LMT, any process of language planning should commence with an understanding of language problems in their

context of occurrence followed by the adoption of strategies to address the language problems and finally the implementation of measures (Neustupny 1994). According to Nekvapil (2009), there are various language problems that appear in discourse. Firstly, there are problems and inadequacies which can be solved directly during an interaction or communicative act. Secondly, there are problems which cannot be solved directly during an interaction but the speaker can make an adjustment design later after probably consulting a dictionary, consulting friends or other people with similar problems. Lastly, there are problems which speakers cannot solve by themselves during a communicative act. Problems of this nature need to be referred to professionals. The LMT is thus important in this particular study in that it provides an understanding of the different types of language problems and, furthermore, provides a framework that facilitates the formulation of strategies to address such problems.

The CATI framework complemented the LMT given the interdisciplinary nature of this particular study. The framework provided an understanding of the various levels involved in the planning and implementation of any localisation initiative. The CATI framework was developed between years 2000-2005 as a result of a study by Vesisenaho (2007) that focused on the development of contextually relevant university level ICT education in Tanzania. The roots of the CATI theoretical framework are the needs of the indigenous population and their convention point with the educational system (Vesisenaho & Dillon 2009). It is important according to this theory to fully explore the valuable opportunities that arise as a result of the community's problems, and inadequacies, in order to create sustainable conditions for localisation initiatives that would be of advantage to the indigenous population (Vesisenaho & Dillon 2009; Vesisenaho, Kempainen, Islas Sedano, Tedre & Sutinen 2006).

The CATI framework's relevance to the adoption of ICT within the educational context is described through four major levels. These include the importation level, the transference level, the application level and the contextualisation level. The importation level can be described as a scenario in which selected components of ICT and knowledge are adopted from an external source without due consideration of the indigenous needs of the population and the context or setting in which it is adopted (Vesisenaho *et al.* 2006; Vesisenaho & Dillon 2009). The transfer level refers to a phase in which human and technological ICT resources are made available to those

who need them through transference. The application level refers to a phase when the potential of ICT resources is realised. This phase is characterized by a successful effort by the local community to make ICT and the skills applicable, beneficial and favorable in the local environment (Vesisenaho & Dillon 2009). The last level, contextualization, refers to a situation when ICT is modified, adopted, re-invented and implemented in a way that augments the local environment and that realises and addresses the needs of the local community (Vesisenaho *et al.* 2006). The CATI framework is important in this study in that it provides a framework that helps in the identification of ICT products that could be of significance in addressing the needs of indigenous African language speakers through ICT localisation.

The model of localisation ecology also complemented the LMT by accounting for the various interacting factors that affect the process of adapting the different aspects of ICT into the local modes of communication and beliefs. The linguistic conceptual framework of localization ecology which was adopted from Haugen's (1972) concept of 'language ecology' has been associated with different scenarios, with the earlier conceptions associating it with various approaches that are used to describe the relationship between human societies and the physical environment. The term was later on adopted and used in more intangible conceptualizations to depict comprehensive processes in societies and in the lives of individuals (Osborn 2010). Localisation can be defined as the adoption and modification of digital information and computer user interfaces into the local languages, culture, values and beliefs (Osborn 2010). There are three fundamental factors of localization ecology namely language, technology and society or sociocultural aspects (Osborn 2010). It is important to note that each of the three basic factors in localisation ecology is wide-ranging and comprises of sections, which play an important role in underlining the significance of interrelationships (Osborn 2010). There are however other factors, outside the three basic factors of localisation ecology, which affect the potential and results of localisation initiatives. These include politics, economics and education (Osborn 2010). The additional three classifications culminate into six headings that account for key factors of localisation. The six different classifications and their relationship render the framework of localisation ecology an important tool for facilitating an appreciation of the setting of any localisation initiative (Osborn 2010).

7. Findings and Discussion

7.1 Language Problems Associated with the Low Profile of Indigenous African Languages in Higher Education

The understanding of language problems as they occur in discourse marks the initial stage of any language management process which then paves way for the formulation of strategies and finally the implementation of such strategies (Neustupny 1994). With regards to language problems, Fan (2008) suggests two philosophical perspectives that form the basis of this theory. The first perspective hinges on the assumption that it is inappropriate to take language problems for granted, rather, it is important to focus on the natural behaviour of different users of a language in order to provide a solution to existing problems. The second perspective is that it is impossible to solve all language problems that occur in natural discourse but it is possible, on the other hand, to manage them (Fan 2008). While Nekvapil (2009) has suggested three different types of language problems (as discusses in the theoretical framework section), this particular study will focus on language problems which speakers cannot solve by themselves during a communicative act or later but which they may forward to professionals.

7.1.1 The Limited Availability of Indigenous African Languages as Languages of Instruction

English and Afrikaans, in particular, maintain their dominance despite a plethora of legislative frameworks that empower indigenous African languages to function as languages of education. While it is often argued that indigenous African languages lack the appropriate terminology to function as languages of instruction in technical fields of study, it is discouraging to note that some universities in South Africa still teach indigenous African languages through the medium of English. In this regards, one of the respondents argues:

The problem of African languages in Higher Education is that there are no African languages in Higher Education, by and large. Even the African languages are taught in English in Higher Education. If you can do a study, maybe a survey of all the South African universities and find out how many teach African languages in an

African language despite their multilingual language policies...All the literature, yes you can argue and say for language you don't have technical terminology but literature is taught in English using Eurocentric theories. It doesn't matter which language the literature is written in, the instrument that is used to analyse that literature is English... The challenge is that African languages are not there in Higher Education. If anything, they are a referent. You refer to them... When you are actually using a syntactic theory because a syntactic is in English, the main agent of discussing it will be the English language and then you refer to parallels that are found in an African language...

It is evident from the above assertion that indigenous African languages are largely reference languages used to provide examples to show different paradigms but are not subjects and objects of comment. While acknowledging the importance of English in this era of globalisation, it is also vital to acknowledge the fact that indigenous African languages could co-exist and co-habit with English within the domain of higher education for the benefit of all students and their societies.

7.1.2 Negative Language Attitudes

Negative language attitudes are perpetuated by the hegemony of the English language and its associated economic, social and political values in most African societies. Economically, English is viewed as capable of facilitating economic prosperity and mobility as most jobs would require graduates who are able to converse in the language. Socially, a person is esteemed and deemed educated if he or she is fluent in the English language. Politically, English is understood to have the capability of uniting different people who speak different languages and belong to different ethnic groups. On the other hand, indigenous African languages are viewed as having no economic value, divisive and associated with lower class individuals in society. However, indigenous African languages, just like any other language, possess the capacity to function in any domain and can accommodate and express foreign concepts from other languages. The use of indigenous African languages should therefore be understood within the framework of facilitating the

understanding of concepts for 1st African language speakers who may not possess adequate competence in the English language. This may prove successful in reducing high failure rates prevalent among African language speakers in most universities.

7.1.3 The Lack of Discipline-specific Terminology for Scientific and Related Fields

The lack of terminology has often been cited as a major hindrance in promoting the utilisation of indigenous African languages within the higher education context. Terminology is a significant element of the teaching and learning process since all concepts need to be supported by appropriate and concise terms. While acknowledging terminology development projects in different South African institutions of higher learning, the general view is that indigenous African languages have crucially limited technical terms, simply because most of them have been confined to family, village and cultural functions. Indigenous African languages thus lack standard terminology in technical fields that may include the applied human sciences, medicine, and science and technology, among others. The lack of terminology should however not be used as a justification to advance the misconception that indigenous African languages are incapable of producing terms that could be used for technical purposes. Indigenous African languages, just like any other language, are capable of expressing various concepts and conceptualising them within the framework of indigenous knowledge systems.

7.1.4 Inborn Language and Identity Issues

Language is not only a vehicle to facilitate communication but it is also an embodiment of a people's culture, their cognitive memory, their indigenous knowledge systems, their history, their values and beliefs. On the basis of this fundamental importance and significance, it can be argued that a language cannot be separated from its speakers as it is a symbol of their identity. Given the multilingual nature of South Africa, it becomes a problem to determine which language should be promoted first or given priority over the other. Politicians who command a great deal of influence in terms of making national decisions are not willing to tackle language issues because of

their associated inherently divisive characteristics. This therefore leads to maintaining the status quo, which is characterised by the continued dominance of colonial languages in higher education and the marginalisation of indigenous African languages.

7.1.5 Weak Bilingualism and Monolingualism

Weak bilingualism and monolingualism are also major language problems in higher educational institutions. Most students who are African language speakers are weak in both their mother tongue and the second language, which in most cases is English. This is a result of a poor foundation at basic level education in which the teaching of an African language is not prioritised because the priority is to submerge or assimilate learners into the dominant language, English. According to Skutnabb-Kangas and McCarty (2008) assimilation in education is defined as the process whereby marginalised groups are forced to conform to dominant languages and cultures by means of coercive strategies aimed at substituting the indigenous language with the dominant one. Such a strategy is detrimental as it hinders the learners' development of both the first and second language. It has been argued that the teaching and reinforcement of a child's first language creates opportunities to learn the second language competently (Skutnabb-Kangas & McCarty 2008).

In addition, monolingualism is prevalent among mother tongue speakers of the dominant language of education in South Africa, English. At face value, it would seem insignificant for mother tongue English speakers to learn an African language. However, given the multilingual nature of South Africa and the high percentage of African language speakers of the entire South African population, the teaching and learning of these languages to non-mother tongue speakers is justifiable. For lecturers and other administrative staff, bilingualism and/or multilingualism is important to facilitate effective communication with mother tongue speakers of indigenous African languages. It is also a significant stride towards the promotion of bilingualism in the classroom. This would facilitate cohesion and empower students with effective communication skills in multilingual work environments. Universities are mandated to produce graduates who will be able to serve local communities who are largely African language speakers, and this could be made possible through enforcing bilingualism and multilingualism among students.

7.1.6 Orthographic Inconsistencies

Inconsistencies in the writing systems of most indigenous African languages are also a major problem in higher education. While these inconsistencies can be traced to dialectal variations, this problem is also perpetuated by poor systems of teaching indigenous African languages at basic education levels. There seems to be little attention or priority given to indigenous African languages thus resulting in a lack of writing skills development for most African language speakers. Priority is often given to the learning of the English language which is the dominant language of instruction at both lower and higher levels of education. The standardisation of orthography should be a priority given the need to promote indigenous African languages as languages of teaching, learning, and research in higher education. The successful development of teaching and learning material, literature and terminology, among other things, all depends on a standardised orthography. In this regard, Ndimande-Hlongwa (2010), while focusing on corpus planning for isiZulu, asserts that orthographical inconsistencies hinder terminologists, language practitioners, educators and language editors from accomplishing their role of intellectualising this particular language as one of the indigenous African and official languages of South Africa. Ndimande-Hlongwa (2010) therefore highlights the importance of addressing orthographic inconsistencies and calls for collaboration among various stakeholders involved such as higher educational institutions and government departments.

7.2 ICT Opportunities in the Promotion of Indigenous African Languages in Higher Education

An evaluation of language problems and the possible available opportunities for integrating indigenous African languages and ICT characterise the second stage of language management. This stage involves deliberations on language problems in their context of occurrence and the formulation of strategies to address them, and finally implementation. It is also important to note that the evaluation stage of language management in any localisation process is a systematic process that has different stages. After the adoption of an ICT product, there is a need to transfer it from its original context and apply it in the local context in order to realise its potential. The final stage would then be

the application of the ICT product, which involves its adaptation to tackle local contextual needs (Vesisenaho *et al.* 2006; Vesisenaho & Dillon 2009). There are various opportunities in ICT that could be instrumental in the promotion and intellectualization of indigenous African languages.

The initial point of ensuring the integration of indigenous African languages with ICT is the development of a national corpus for the different officially recognised indigenous languages of South Africa. Such an initiative would encourage the development of human language technology, in order to ensure the presence of these languages in the ICT domain, for research purposes, for teaching and learning and for the purposes of community engagement. The availability of human language technology could also be instrumental in promoting the status of these languages, address the problem of orthographic inconsistencies and negative language attitudes, among others. In relation to this point, one of the respondents argues:

In order for a language to effectively contribute to the knowledge economy in different ways, you have to have certain things that enable the language to function at a technical level or that make the language technically viable. Basically, you need a corpus of that particular language. Once you have the corpus, corpus protrudes. The availability of a corpus means that as a protractor, you need to have literature in that language and you turn that literature into a corpus. And to have literature in that language, it means you have to have a writing system, a consistent writing system, the orthography.

This therefore means that any efforts towards the effective use of ICT in the promotion and intellectualisation of indigenous African languages should commence with a considerable investment in the field of corpus linguistics. Examples of human language technologies include spellcheckers and correctors, grammatical checkers, morphological analysers, online dictionaries, machine translation tools, multilingual glossaries, terminology management systems and speech technologies.

Learning Management Systems (LMS) software has become a common feature in most institutions of higher learning and present an opportunity for ICT localisation. LMS provide learners with an opportunity to access learning content at any time of the day and further assist institutions

to administer distance learning programs. Most of the LMS tools are web-based meaning that they can only be accessed through the internet and web browsers (Machado & Tao 2007). LMS tools are either proprietary software applications or open source software. Examples of proprietary software LMS tools include eCollege, Learning Space, Blackboard and Web CT. On the other hand, examples of open source software LMS tools include MOODLE and GNU general, uPortal, and Open Source Portfolio Initiative, among others. The localisation of LMS user interfaces, different functions and associated documentation such as user guides would promote instruction in indigenous African languages and further promote the functions and status of these languages in the ICT domain. Such inclusiveness will promote the acceptability of the finished localisation products by end users and the concerned community.

Computer Assisted Language Learning (CALL) software also presents an opportunity for ICT localisation. The development and advancement of CALL software has been particularly associated with second language or foreign language pedagogy with commendable output. Within the South African context, some higher educational institutions have slowly been adopting the use of CALL software in the teaching and learning of indigenous African languages as they strive to promote the acquisition and intellectualisation of these languages. It is however important to adapt these tools such that they could accommodate the unique characteristics of these languages and furthermore address the needs of indigenous African language learners. It is argued, firstly, that within the context of language learning, computer technology presents learners with a platform for meaningful use of language within authentic contexts through the provision of fast and easy access to authentic language material such as audio files, corpora and newspapers, among others. Secondly, ICT promotes collaboration and cooperation in language learning as learners and instructors can communicate and share ideas with their peers from different sites. Thirdly, CALL software applications promote effective teaching by teachers as such tools have the ability to provide a platform for language teachers to administer personalised and individualised guidance for learners (Jonassen *et al.* 1999, cited in Kumar & Tammelin, 2008). Examples of CALL software that has been employed by most institutions in South African higher education include hot potatoes, MOODLE, online language courses, online language games, among others.

Scholars have argued that despite the growing availability of content

with regard to indigenous African languages on the web, there are only a few web-based applications which have been localised in order to accommodate users and speakers of indigenous African languages (Dalvit *et al.* 2008). The localisation of such applications, more importantly, should involve the translation of user interfaces, among other things, to enable users to easily navigate through applications using their own native languages. The available opportunities for localisation, in this regard, include computer operating systems, web-pages, browsers and mailing systems. Examples of web applications that have been localised include Mozilla Firefox, the South African version of the Google search engine and Web-mail at Rhodes University. Social software and multi-media products also present another important platform for the integration of indigenous African languages with ICT. While some of these products are incorporated in LMS and CALL software, they can also be used individually to support the processes of the teaching and learning of indigenous African languages. Examples of social software products include blogs, wikis, podcasts and Facebook.

7.3 Challenges of Integrating ICT and Indigenous African Languages in Higher Education

The challenges that affect the integration of ICT and indigenous African languages should be understood within the context of the various interacting factors of localisation ecology that affect the process of localisation namely language, society, technology, economics, politics and education (Osborn 2010). These factors are not independent of each other but are inter-related and overlap to provide a comprehensive conceptualisation of the challenges associated with integrating ICT and indigenous African languages. Firstly, the lack of expertise and collaboration between technological experts and language experts presents a major challenge to any localisation initiative. There seems to be a lack of interest or awareness of the significance of ICT localisation among most technological experts. At the same level, most language experts lack the necessary technological skills to design and modify software. This lack of collaboration also translates into a lack of coherence between language policies and ICT policies in most South African universities.

A lack of financial resources to support localisation projects could

also be another major challenge. Localisation is an expensive process involving computer software, expertise and translation among other things and is also a prolonged process. The situation on the ground is that investors and stakeholders are reluctant to invest in localisation projects as they view indigenous African languages as unmarketable. It is argued that negative perceptions towards the use of indigenous African languages may hinder localisation projects. There is therefore a need for universities and/or localisers to formulate effective marketing strategies for localised software to promote their use by students and staff, and the local community. Indigenous African language content also constitutes a considerably low percentage of the entire web content. Given the need to increase the amount of localised software and web content, the translation process could require a great deal of labour and furthermore could consume time and financial resources. Although machine translation could be considered as a possible option in addressing such a challenge, the situation on the ground is such that most translation tools that have been developed lack accuracy and therefore need further modification and development.

8. Conclusion

Conclusively, the integration of African languages with information and communication technology is essential in promoting and intellectualising African languages in Higher education. The major opportunities available include national corpus development, open source software localisation, and the use of technological tools to assist teaching and learning in African languages. Availability of content in African languages in the internet opens up a number of opportunities as well. It is also important to adopt a language management approach in efforts to promote African languages as it provides a clearer understanding of the language problems within a specific setting, thus providing an opportunity of evaluation and the formulation of informed recommendations and implementation strategies.

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