In Pursuit of Preserving Namibian Languages: The Development of the Ndungika App, an Oshiwambo Children's Android Application

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Abstract: Indigenous languages are often at risk of extinction, especially if they are not well preserved, and when their native speakers seldom practice it. Namibian indigenous languages are not spared from this risk, due to the fact that the children are most often from various tribes, especially in cities, and they normally communicate in English as the sole official language used in Namibia schools. As children grow, they tend to become resistant to using home languages and exhibit an increasing desire to conform to the majority language speakers. Many recent studies have focused on the importance of preserving languages through teaching of children songs, poems and stories. The purpose of this research was to collect Oshiwambo language children's songs, poems and stories and to develop an android application to host them. This was a randomized study. Children from 3 to 15 years of age, fluent in speaking any of the 13 Oshiwambo dialects were eligible for participation. Participants were randomly selected and through structured interviews, they were asked to sing any song in any of Oshiwambo languages or tell the story or a poem, and they were audio/video recorded. The designed application is envisaged to help in the language's preservation.

1 INTRODUCTION

Over the years, the practice of speaking countries' official languages in Africa due to colonialization, has negatively affected the usage of native languages. After the countries gained independence, the languages imposed by the colonizers continue to dominate, eventually being recognized as the official languages (Norro, 2022).

Namibia is a country of many languages, of which 13 have been recognized as national languages, and Oshiwambo language, which consists of several dialects, is spoken by close to 50% of the Namibian population (MBESC, 2003).

The Namibia's Language Policy states that English is the country's sole official language, but instruction for primary school learners from Grades 0-3 should be delivered in mother languages (MBESC, 2003). However, this is hardly practiced in heterogeneous classrooms, where learners are coming from different language backgrounds, because the policy is not supporting multilingualism (Ashton et al., 2008). Therefore, many schools, especially those in cities and towns, where children speak several languages end up opting to instruct the learners in English only from Grade 1 (Chavez, 2016).

This practice has especially affected the children, who end up being denied the privilege of learning their mother tongues. This can result in forthcoming children finding little to no knowledge of their languages, making them incapable to relate to the cultural heritage, which puts the language and its culture in danger to be labelled as extinct. Therefore, it is important to make innovative ways that will

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enhance our language skills, as well as to preserve them.

The adoption of technology for language teaching and learning proved to be effective (Galla, 2018), and mobile learning has become even more popular. Due to the popularity of mobile devices, the young generation are able to engage in learning activities on mobile devices, both in formal and informal settings (Kukulska-Hulme, 2009).

Interactive mobile applications have also gained popularity over the years among children and young adults. Some applications were developed for learning, and others for fun.

In this research study, an Oshiwambo application known as Ndungika App, was developed with a purpose of connecting Oshiwambo speaking children to their language, by being able to listen to old Oshiwambo folklores, songs, as well as poems. As a result, this would also help them complement their language skills.

1.1 Background of the Study

In Oshiwambo culture, it's a norm to tell stories and teach children songs. This is normally done at night, after dinner at family evening devotions, or during the day when children are playing. These stories and songs are more related to old age fairy tales and to Oshiwambo culture and tradition. They help children to know their culture and pass that knowledge to the future generation, in order to preserve Oshiwambo culture and the language. Conde (2019) explained the importance of indigenous languages as the main form of interaction with our environment. The study also highlighted that indigenous languages represent the legacy of our grandparents, and our obligation is to take care of them because when an indigenous language disappears, the indigenous traditional knowledge also disappears.

Similarly, research by Trinidad (2019) explains that language loss means that people cannot communicate with certain family members or pass on a vital piece of heritage to their own children. The loss of indigenous language by the children has a great impact on communication between adults and the children, which might affect family relations. Many recent studies have focused on the importance of preserving indigenous languages through teaching of children songs, poems or stories (Puthuval, 2017). This helps in preventing language shifting. Language shift happens when a group of people stops using one language in favour of another, such that subsequent generations no longer acquire the original language (Puthuval, 2017).

However, as much as one can echo the virtues of oracy in preserving culture and language, particularly in the technologically semi-literate society. The fact is that, many African indigenous languages in the context of rapid development and modernisations have been thrown into a world in which integrating them with technology is an inevitable prerequisite. This paper aims to contribute to such exercise.

1.2 Problem Statement

In modern days, most families spend their evenings in front of televisions, and there is no time for traditional storytelling or teaching of children songs. And since most parents are employed, they spend their days at work and when they come home, they are tired and go straight to bed. According to Marsh et al. (2016), children spend less time playing physically, mixing with different generations, creating imaginary games, and interacting with parents.

In most cases when children begin school, they know, to a large extent, what they have learned in their mother tongue(s). Indeed, this is supposed to be the actual starting point for all learning, however, in multilingual settings, such as Namibia, this fact is often ignored and hindered when the language of teaching is different from the children's mother tongue(s). In addition, many Oshiwambo speaking children, for instance, start school at early ages. At those schools, they mix up with children from different tribes who speak different languages. Because of this, they are taught all the stories and songs in English since it's the medium of instruction and the official language, and they are not being taught something in Oshiwambo that will help preserve their indigenous language. As such, English then begins to replace children's home language as the language of learning. According to Cunningham, (2017) it has been observed that, as children move up the school, they tend to become resistant to using home languages and exhibit an increasing desire to conform to the majority language speakers.

Also, most children have mobile devices, they spend their free time playing video games or watching noneducational videos and movies. Marsh et al., (2016) indicated that many children are becoming socially isolated because their leisure time is spent in front of a computer or television. They are losing the ability to empathize, to communicate and to read emotional language. This minimizes the chance of physical interaction with other children and

learn new Oshiwambo language folklores, poems and songs.

The objectives of this study are:

1. To develop an application that will help Ovawambo to preserve their culture and language.

2. To design and develop an application that will teach Ovawambo children different Oshiwambo language children's folklores, poems and songs.

The importance of this study is that, it will help in preserving the Oshiwambo indigenous language through the telling of their stories, poems and songs to children who will pass them on to their children.

According to Puthuval (2017), a better understanding of the long-term dynamics of language shift would improve not only our understanding of the language endangerment crisis, but also the understanding of language ecology at earlier periods in human history. Niland (2012) explored how new songs could become part of the musical cultures of young children.

Since most children do not spend most of their time with their parents, there is no one to teach them and no time for them to learn cultural children's stories, poems and songs. The application developed in this research will help solve that problem since most children have access to smart devices such as tablets and cell phones, where the application can be installed.

2 METHODOLOGY

The data collected for this research was obtained by conducting face to face interviews with participants from the northern part of Namibia, where the Oshiwambo language is dominantly spoken. It focused on children who are fluent in the language. The main reason why children were deemed fit for the study was because the App that is being developed is for children, therefore, it would be more adaptable and fun for the children if they are listening to voices of fellow children.

The study population comprised of 50 inhabitants from 5 villages located in Omusati and Ohangwena regions (Ongungila, Oshivanda, Okambebe, Omughete and Omungwelume) in the range of three to fifteen years old. Participants were randomly selected. As a result, a sample of 28 participants was used.

Ethical considerations in this study were taken into account in relation to permission, informed consent and anonymity. Everyone directly involved in the research was informed about the aims and nature of the study before participation. Since the participants were still minors and still under the guidance of their parents, informed consent letters were sent to the participants' parents explaining the purpose of the research and requesting permission for their children to be part of the research. In these letters it was also explained to the participants and their parents how the recordings will be anonymised and used. Parents were asked to read, sign and return the letters as an indication that they had agreed for their children to be part of the research. The participants and their parents were made aware that the data will be distributed publicly. Furthermore, copyrights and other forms of intellectual property were honoured, and the use of unpublished data or results without permission was avoided.

The actual collection of data collection in the form of unstructured interviews were carried out at different places. In many occasions, the researchers visited the participants at their houses or the participant(s) and the researchers would meet at an agreed place free from unwanted noises or disturbance. The participants were interviewed openly and asked to tell any children's story, poem or sing any children's song they know. The interviews were audio recorded with a smartphone. Data was stored in audio forms. As a result of these interviews, eighteen (18) children's songs were recorded from 16 participants. Seven (7) stories from five (5) participants and four (4) poems from 4 participants.

In addition, secondary data was also collected from previously published work, such as Oshiwambo literature books that are related to the research.

The researchers got hold of the book titled Omatevelo 4 (Nghifikua, 2011), and three poems from the book were used in an application (Owambo, Omahangu and Fimbi). The researchers made some participants to read out these poems and they were recorded.

This research yielded mainly unstructured data. In order to present the most relevant data, all the data collected was analysed.

With this research, since the interviews have been audio recorded, there was a need for cropping. Some audio recordings were cropped in order to remove unwanted conversations, as well as time lapses. This was also done to remove anything that would unveil or compromise the participants' identities.

After cropping audio recordings, the next stage performed was to categorize the data. All the data were subdivided and assigned into categories. This process was done manually by the researchers.

The data collected was divided into 3 categories: poems, songs and stories. There were three folders created on a computer, one for each category, and data belonging to each category would be placed in a corresponding folder.

The next stage after categorizing data was identifying of themes, patterns and relationships between data in each category. In qualitative data analysis, applicable techniques that can be applied to generate findings and analytics are not universal, therefore critical thinking skills of researcher plays a significant role in data analysis in qualitative studies (Lester et al., 2020).

In the stage of identifying themes, relationships and patterns, data went through three analysis steps. The first step is content repetition. The researcher went through each category and look for any repetitive or similar content. If any repetitive content was found, the duplicate was to be deleted and only one will be left. The second step was primary and secondary data comparison. The findings of interviews were compared with the findings of literature review and the differences between them were discussed. The ones of poor quality were removed. The last step in identifying patterns and relationships was searching for missing information, finding which research issues that were not mentioned although they were expected to be mentioned or covered.

The last stage in data analysis was: summarizing the data. In this stage the researcher compared and linked the research findings with the research objectives. This included removing content which contained verbal languages, content with poor audio quality and all contents which expose participants identity. The themes that were identified were: poems, songs, and folklores/stories.

For the development of an application, Android studio software was used for all coding and compiling. For image manipulation, editing and free-form drawing, the GNU Image Manipulation Program (GIMP), was used. The final animated videos were created using a trial version of Mango Animate animation Maker.

As a result, the application that was developed in this research has three separate parts. One part hosts the songs, the second part hosts stories and the third part hosts poems. The next section offered the detailed description of the application and its implementation.

3 APPLICATION DESIGN AND IMPLEMENTATION

This research study followed the waterfall model, which has four phases, namely: Requirements gathering and analysis, Design, Implementation and Testing (Sommerville, 2016). One of the advantages of the waterfall model is that, it is very easy to understand and use, and the phases do not overlap, one has to be completed, before the next phase is started. It was deemed suitable for this research, because all requirements were clear from the beginning, and it was unlikely to change them during the implementation.

3.1 Research Gathering and Analysis

In this phase, the requirements were identified and analysed. The main functional requirements identified were:

a) The application should be able to run on Android

b) It should be able to host songs, poems and stories in audio and video format.

c) The application should be a one-tier application, and all the data should be contained in the application.

3.2 Design

In this phase, the system was designed, which included the conceptual design, as well as paper prototypes. The software used for the design and development of an application was an open-source Android studio. For the application architecture design, the Model View Presenter (MVP) architecture was used. "The MVP design pattern is set of guidelines that should follow for better code reusability and testability" (Morris, 2019). It contained three layers:

The first layer is a view layer. This layer contains the user interface, where the user interacts with the server, in order to request a specific content from the application. The home page of an application contained three buttons, directing to songs, poems and stories. The stories home page contains the grid layout with clickable content. These contents are the displays or thumbnails of stories. The user is able to click on any story and direct it to the page hosting that specific story. The poems homepage contains the video view and the list view. The user is able to press on any content on the list view and the corresponding

content will be displayed in the video view. The songs home page/activity contains the video view for playing videos and the grid layout.

The second layer is the presenter layer. These are the codes connecting the view layer to the requested content.

The third layer is the model layer which contained the data/videos to be presented to the user on a request.

3.3 Implementation

Using the inputs from system design, four separate modules were developed, namely: the home page, stories, poems and songs. Each module was coded and tested separately in the Android studio emulator for its functionality. All the system design ideas in corresponding requirements were converted into source codes and user interfaces.

3.4 Integration and Testing

After successfully testing all the modules in the implementation stage, they were integrated together. modules, the entire system was tested in the emulator and all modules were corresponding. The system was further tested on two mobile phones (Lenovo TB-73051(Figure 1) and Samsung J3) and all functionalities were working.

4 RESULTS

By analysing the data from interviews and secondary data, ten (10) songs, seven (7) stories and seven (7) poems qualified to be included in the application. The application was successfully developed and tested. It has a home page from where a user can choose one of three options, by clicking the corresponding button, first option takes the user to the songs (button written "ouimbilo"), second option is for poems (button written "outevo") and the third option is for stories (button written "ouhokololo"). The songs content page or fragment has a video view and ten image buttons where a user can click, and the corresponding song visuals would display in a video view. The user can use media controllers to play, pause or rewind the songs.

The poems fragment has a video view and list view containing poems, which plays when clicked. Whereas, the stories section also has a stories home page with clickable images and texts. Once any image is clicked, it will display the corresponding fragment, with a video view displaying that animated story and

buttons to play, pause, play the next story or the previous one. For the songs, poems and stories fragments, there are four image buttons at the top which directly take the user either to any of the sections. Figure 1, 2, 3, and 4 below show the Application home page, the songs section, the stories section and the poems section respectively.

Figure 1: Ndungika Homepage.

Figure 2: Songs Section.

Figure 3: Stories Section.

Figure 4: Poems Section.

5 LIMITATIONS

The first limitation was the lack of enough previous research studies on the topic. Due to this, the current research had to start from scratch, which was time consuming.

The second limitation was the limited access to data. Due to the outbreak of the novel coronavirus, it was risky to get in close contact with many people when collecting data.

6 CONCLUSION AND RECOMMENDATIONS

The primary purpose of this research study was to develop an Oshiwambo Android application for children, where they will be able to listen to poems, songs and stories. This research involved designing and developing an application and collecting data to be presented by the application. The data collection was a success, although there were some limitations such as limitation to data and cultural bias. In total, 10 songs, 7 stories and 7 poems are hosted in the application. Both the application and the content hosted will help in the preservation of Oshiwambo language.

The application design and development followed a waterfall model architecture and the open-source Android studio software was used for coding and units testing.

In addition, the research has contributed to the body of knowledge concerning the utilization of technology to enhance the Oshiwambo learning experience. The study recommends that the application should be turned into a multilingual application, considering that Namibia is a country with many languages. Therefore, it will be very beneficial to be able to host other Namibian languages on the App.

Furthermore, currently the Ndungika App only runs on Android, it is recommended that it should be developed further, in order to enable it to run on other platforms.

REFERENCES

Ashton, D., Iijambo, T., Matengu, M., & Kalenga, E. (2008). Implementation of the Government of the Republic of Namibia's Language Policy for Schools in Selected Primary Schools in Windhoek. *NERA Journal A Journal for the Namibian Research Association*, 17–29.

Chavez, A. (2016). Rights in Education and Self-Identity: Education and Language of Instruction in Namibia. *International Education Studies*, *9*(3), 189. https://doi.org/10.5539/ies.v9n3p189

Conde, K. (2019). *Towards the teaching of indigenous languages in schools. Voices of Youth.* https://www.voicesofyouth.org/blog/towards-teaching-indigenous-languages-schools

Cunningham, C. (2017). *Saying more than you realise about 'EAL': Discourses of educators about children who speak languages beyond English*. University of York.

Galla, C. K. (2018). Digital realities of indigenous language revitalisation: A look at Hawaiin Language technology in the modern world. *Language and Teaching*, *20*(3), 100–120.

Kukulska-Hulme, A. (2009). Will mobile learning change language learning? *ReCALL*, *21*(2), 157–165. https://doi.org/10.1017/S0958344009000202

Lester, J. N., Cho, Y., & Lochmiller, C. R. (2020). Learning to Do Qualitative Data Analysis: A Starting Point. *Human Resource Development Review*, *19*(1), 94–106. https://doi.org/10.1177/1534484320903890

Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J., & Scott, F. (2016). Digital play: A new classification. *Early Years*, *36*(3), 242–253. https://doi.org/10.1080/09575146.2016.1167675

MBESC. (2003). *The Language Policy for Schools in Namibia* [Discussion Document]. NIED.

Morris. (2019). *Android MVP Architecture for Beginners (Demo App)*. https://androidwave.com/android-mvp-architecture-for-beginners-demo-app/?nowprocket=1

Nghifikua, A. L. (2011). *Omatevelo 4*. Macmillan Education.

Niland, A. (2012). *Exploring the lives of songs in the context of young children's musical cultures*. 27–46. https://www2.biu.ac.il/hu/mu/min-ad/12/4%20Niland.pdf

Norro, S. (2022). Factors affecting language policy choices in the multilingual context of Namibia: English as the official language and medium of instruction. *Apples - Journal of Applied Language Studies*. https://doi.org/10.47862/apples.107212

Puthuval, S. (2017). *Language maintenance and shift across generations in Inner Mongolia*. http://sarala.puthuval.net/files/20170321_puthuval_dissertation.pdf

Sommerville, I. (2016). *Software Engineering, 10th Edition*. Pearson.

Trinidad, C. (2019). *Heritage Language Learners: On the Brink of Language and Cultural Loss*. https://www.proquest.com/docview/2240071563

UN. (2014). *Who are indigenous peoples?* https://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf