Aplicación *Android* para fomentar el aprendizaje del idioma Kichwa

Android application to foster Kichwa language learning

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Resumen

El idioma Kichwa es uno de los pilares fundamentales de pueblos ancestrales en América latina y forma parte de una cultura nacional. Este idioma en el Ecuador está reconocido como lengua oficial por la Constitución y la Ley Orgánica de Educación Intercultural (LOEI). El Kichwa es hablado por varias comunidades del callejón interandino, sin embargo, los conocimientos han sido transmitidos en Castellano. El presente artículo propone el desarrollo de una aplicación con sistema operativo Android para establecer una guía de aprendizaje interactiva del idioma Kichwa en Ecuador. En la actualidad las personas se encuentran muy familiarizadas con el uso de dispositivos móviles sobre todo con teléfonos inteligentes; las aplicaciones son desarrolladas con diferentes propósitos y pueden ser adquiridas por los usuarios dependiendo de sus requerimientos, se han convertido en una herramienta digital sumamente utilizada tanto por estudiantes como por docentes por su accesibilidad y su entorno inteligente. El propósito es encauzar estos lineamientos tecnológicos para priorizar culturas, saberes ancestrales, costumbres y valores comunitarios. El idioma como elemento histórico, social y cultural contribuye a reafirmar la identidad, por ello con base en una investigación documental se determinará información para desarrollar aplicaciones móviles, esto permitirá establecer un diálogo directo entre la tecnología y el entorno sociocultural.

Palabras clave

Android, aplicación, aprendizaje, cultura, Kichwa.

Abstract

Kichwa is one of the main pillars of ancestral people in Latin America and is part of a national culture. This language in Ecuador is recognized as an official language by the Constitution and the Organic Law on Intercultural Education (LOEI). Kichwa is spoken by several communities of the inter-Andean communities; however, the knowledge has been transmitted in Spanish. This article proposes the development of an application with Android operating system to establish an interactive learning guide of the Kichwa language in Ecuador. Today people are very familiar with the use of mobile devices especially with smartphones; applications are developed for different purposes and can be purchased by users depending on their requirements, becoming a highly used digital tool by both students and teachers for their accessibility and intelligent environment. The purpose is to channel these technological guidelines to prioritize cultures, ancestral knowledge, customs and community values. Language as a historical, social and cultural element contributes to the reaffirmation of identity, so on the basis of documentary research information will be determined to develop mobile applications, this will allow a direct dialogue between the technology and the socio-cultural environment.

Keywords

Android, application, learning, culture, Kichwa

1. Introduction

The use of tablets or smartphones has grown hand in hand with mobile applications for Android operating systems; one of the areas where they are applied is in education, as they strengthen teaching-learning processes. Ecuador is an intercultural country, the Organic Law on Intercultural Education (LOEI) published in the year 2011 and the Ministry of Education 2016 establish rules and policies to strengthen respect for indigenous communities, people and nationalities; being one of the relevant aspects of our culture the Kichwa language (p. 29-32). This research paper proposes the development of an interactive Kichwa language learning guide to rescue the culture.

Education is currently a right established in Ecuador's constitution. Having a quality education is one of the greatest challenges facing the Ecuadorian state. In this regard, Article 26 of Ecuador's Constitution states:

> Article 26.- Education is a right of people throughout their lives and an inescapable and inexcusable duty of the State. It is a priority area of public policy and state investment, guarantee of equality and social inclusion and an essential condition for the good living. Individuals, families and society have the right and responsibility to participate in the educational process (Asamblea Constituyente, 2009, p. 27).

To obtain quality in education, exclusion and discrimination must be avoided. Analyzing the educational needs of students and human diversity in their social, ideological, cultural and ethnic aspects will enable the development of educational competences (Ministerio de Educación, 2013, p. 18). The Ecuadorian state has signed several national and international agreements to guarantee the rights of students for a quality education (Ministerio de Educación, 2013, p. 13).

Indigenous people and nationalities use and maintain ancestral languages that are for official use. In this regard, Article 2 states:

> Article 2.- Spanish is the official language of Ecuador; Spanish, kichwa and shuar are official languages of intercultural relationship. Other ancestral languages are of official use to indigenous people in the areas where they live and in the terms established by law. The State shall respect and encourage its conservation and use (Asamblea Constituyente,2009, p. 16).

Ecuador seeks to mitigate the cultural shock and it strengthens the presence of indigenous languages to strengthen the teaching-learning process of two languages (Spanish and Kichwa), meeting the needs of the two languages. Curricular adaptations necessary for the transmission of languages that form the culture since ancient times have been done; therefore, the country has the Bilingual Intercultural Education System (SEIB), contemplated in the Organic Law of Intercultural Education (Ley Orgánica de Educación Intercultural, 2017, 51-57).

In this research perspective the following question arises: Are there Android apps that promote Kichwa language learning? The aim of this study is to determine and apply Android operating system. This type of system has the Linux kernel, which means that the operating system is open, free and cross-platform (Borrego, 2012, p. 2) which allows to take advantage of all the technological features in the development of an interactive guide to learn a language.

Kichwa language is recognized as the official language of the country, and by having a learning guide the students will be familiar with aspects of their culture. The use of technological tools is important in order to create solutions that support the learning of ancestral languages of Ecuador. In Ecuador, the SEIB indicates that education starts from early stimulation to the High level (Ministerio de Educación, 2019).

The research is documentary and will determine information related to the new technological trend of mobile application focused on learning the Kichwa language in Ecuador. With the information collected, it is proposed to develop an application under the same Android operating system, which can be used by both students and teachers.

The article is structured in four parts: The first part shows generalities in the educational context focused on interculturality in education and on the importance of the Kichwa language. The second part is the development of research with related work in the field of applications in the teaching of the Kichwa language. The third part is to develop an Android app to encourage the Kichwa language in the teaching-learning process. Finally, the last paragraph presents the conclusions of the work.

2. Educational field

2.1 Interculturality

There is a wide cultural diversity at the global level; the United Nations for Education, Scientific and Cultural Organization (UNESCO) defines interculturality as "a comprehensive and human rights approach that refers to building equitable relations between people, communities, countries and cultures" (UNESCO, 2006, p. 17).

It is worth mentioning that interculturality not only implies the coexistence of culture, but rather a sustainable relationship of the whole society framed in the respect, maintaining

communication and tolerance that allows to overcome exclusion or any kind of prejudice generated in a culturally diverse society. Mutual learning between different cultures encourages and enriches a country, but above all it promotes intercultural education.

2.2   Intercultural education (Legal foundation)

In the educational field, interculturality presents an equitable dialogue between different cultures in order to strengthen the ancestral knowledge and inclusion. In this context, Ecuador seeks to institutionalize interculturality by implementing laws, policies, programs and projects at the national level (Ministerio de Educación, 2013, p. 18).

After the elaboration and publication of the 2008 Constitution, which contemplates interculturality and multinationality in the idea of Good Living and with regard to Intercultural Education, the following is established:

> Article 343.- The purpose of the national education system will be to develop individual and collective capacities and potentials of the population, which enable learning and the generation and use of knowledge, techniques, arts and culture. The national education system will integrate an intercultural vision with the geographical, cultural and linguistic diversity of the country, and the respect for the rights of communities, people and nationalities (Asamblea Constituyente, 2009, p. 160).

In March 2011, the Organic Law on Intercultural Education (LOEI) was approved. This project advocates interculturality in order to ensure that everyone can access education as shown below.

> Article 1. Field. - This Law guarantees the right to education, determines the general principles and purposes that guide Ecuadorian education in the framework of the Good Living, Interculturality and Multinationality, as well as the relationships between its actors (Ley Orgánica De Educación Intercultural, 2017, pág 8).

2.3   Bilingual intercultural education (Legal foundation)

The Organic Law on Intercultural Education guarantees the right to education and formulates fundamental aspects in the educational field. One of the edges is Intercultural Bilingual education, in which the teaching-learning process of two languages is defined. According to the information found on the website of the Ministry of Education Ecuador has 14 nationalities and 18 towns detailed below:

> Nationalities: Shuar, Awá, Eperara siapidara, Chachi, Tsa'chi, Kichwa, A'i (Cofán), Pai (Secoya), Bai (siona), Waorani, Achuar, Shiwiar, Sapara, y Andoa (Ministerio de Educación, 2019,pág 2).

> Kichwa towns : Otavalo, Palta, Panzaleo, Puruwa, Karanki, Salasaka, Saraguro, Tomabela, Waranka, Chibuleo, Kayambi, Kichwa Amazónico, Kisapincha, Kitu kara, Kañari, Manta, Huancavilca, Natabuela and Pasto (Ministerio de Educación, 2019, p 2).

Each of the nationalities and people has its own education, recognizing the rights established in the Constitution of the Republic of Ecuador. In addition, it recognizes the Afro-Ecuadorian and Monsoon people (Ministerio de Educació, 2019, p. 2)

2.4   Kichwa language

The Kichwa is a family of languages originated in the Andes. It is spoken in countries such as Ecuador, Peru, Bolivia, among others. Throughout history, the Kichwa has been gradually replaced by the Spanish language due to the Spanish conquest. Currently in Ecuador according to Mejeant:

> Kichwa language is spoken in the inter Andean from the north of Imbabura to the south of Loja province and in the Ecuadorian East in the provinces of Napo, Orellana, Pastaza, Morona Santiago and Zamora Chinchipe" (Mejeant, 2001).

The Kichwa language as mentioned is spoken in several provinces at the national level by indigenous communities, the use of the language is part of the culture. Language is part of a country's cultural heritage, as it involves cognitive and intercultural knowledge.

2.5   Android app

Technology has advanced markedly over the years and it has revolutionized the life of the whole world; Information and Communication Technologies (ICT) are present in education, and there is no doubt that new technologies changed the teaching-learning process, in which the role of the teacher and the student has changed. The teacher seeks new strategies where teaching technological resources are used to reach students; the same as using digital platforms and mobile devices have access to educational tools for their training.

The use of ICT in the educational field has evolved over the years, every day there are new digital tools and devices for information, one of them is Mobile Learning term that refers to the use of mobile devices for learning, where people interact anywhere. This new technological trend contributes to education, where students are more productive when using mobile apps, because they feel motivated (Telefónica, 2016, p 4-5).

An Android Operating System is present on mobile devices such as smartphones, watches, cars, tablets and TVs. It is an open source system based on the Linux Kernel (Borrego, 2012, p 2) that allows to control the mobile devices mentioned above. In recent years and due to technological advancement it has been an operating system that has managed to consolidate as one of the most widely used in the world and with greater prospects of development due to the stability it has. In Figure 1 can be observed the growth of the Android operating system from 2009 to 2018.

Cifras expresadas en porcentajes
■ Android ■ iOS ■ Symbian ■ RIM ■ Microsoft
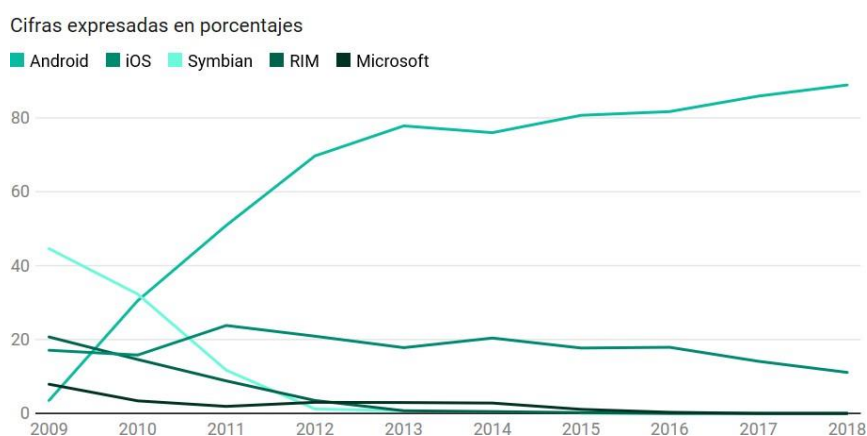
Figure 1. Evolution of Android market share. Accelerated Android growth from 2009 to 2018. Source: (Statista, 2018, p. 1)

The statistics show that the Android Operating System has grown markedly in recent years since 2009. According to RIMy Symbian operating systems, in 2009 it had a higher usage percentage than Android. In other words, at the beginning it doubled and even quadrupled the computers that used these operating systems. But from 2011 and 2012 it totally declined to critical levels where there are little computers that use these operating systems.

With regard to Microsoft's operating system for smartphones, it became a minority system, which did not grow in recent years and has had little impact with regard to Android. Additionally, the IOS operating system is considered stable because it has remained in the years, but attention should be paid to the fact that between 2014 and 2018 it has had a considerable decrease. What is clearly striking is the increase that the Android operating system has had so great, in the figure it is shown that between 2009 and 2010 it doubled to one of its main IOS competencies. This shows that over the years all operating systems on the market have been consolidated and surpassed by reaching figures of 80% of smartphone usage to date.

Additionally, the growth of Android is also attributed to the increase in the number of applications available on Google Play, by being free or by having low costs. Therefore, Android is consolidated as one of the most widely used operating systems in the world for smartphones with more than 2000 devices in the world and more than three million applications (Statista, 2018, p. 1).

3. Related works

This study was documentary type with works related to the development of mobile applications for learning the Kichwa language. Kichwa language is spoken in 13 provinces of the country, but it has variants since it depends on where it is spoken. María del Pilar Cobo states that:

> Our kichwa is a variant of Quechua that is spoken only in our territory. The particularity of the Ecuadorian variant is that it does not have the vowels –e and –or (hence it is called kichwa and not Quechua) (Romero Lucia, Guanolema Cesar, Caiza José, 2016, pág 12).

After gathering information with Applications related to Kichwa in countries such as Colombia, Peru and Bolivia, it is evident that there is a greater influence of Android applications for the Quechua language. Therefore, dialects, grammar, accent and pronunciation varies by country within the region. For example: home in quechua is written *wasi* and in kichwa *kawsay*. This shows the indigenous characteristics of each of the indigenous people of each country. The following shows a collection of Android apps applied to the Quechua language in other countries to have international references as shown in Table 1.

Name	Description
Curso de Quechua	Curso de quechua is basic for beginners or for people who are starting to learn quechua, but it later adds more topics.

Habla Quechua	Aplicación que contiene clases, nombres en quechua, diccionario, historia, videos e información en quechua. App containing classes, Quechua names, dictionary, history, videos and information in quechua.
Diccionario Español y Quechua LearnQuechua	App that allows to translate words from the Spanish to Quechua. It contains modules for learning colors, animals, letters and body parts in the quechua.
QichwaDic - Diccionario de quechua	Quechua – Spanish dictionary containing: - Cuzqueño quechua - Ancashino quechua - South unified quechua - Bolivian quechua - Cuzqueño colonial quechua - Apurimeño quechua
Aprendiendo quechua	Quechua language learning app, very easy to use and incorporates nice graphics, pronunciation audio and writing for people to learn how to pronounce variety of words
Curso de quechua	Course to learn quechua
Wawa-Quechua	It allows children from 3 to 5 years old to learn quechua. Among the relevant contents are vowels, consonants, numbers, family, colors, fruits, animals and expressions.
Cuentos en Quechua Perú	The stories are written in Spanish and Central Quechua language but can be understood by the different speakers of the language, since the central variant is like a prototype of the different varieties.
Aprende Quechua	Learn quechua by playing, which includes pronunciation and some phrases, additionally it shows number information, family, colors.
Play Quechua	App displayed as a game where people have to translate to quechua the word that appears.
YachayQuechua	Encourage the use of quechua language through notes, current news, music, videos, comics, games.
LlulluWawa	It makes it easy for children from 3 to 5 to learn quechua through sounds and images of vowels, colors, family.

Quechua Bolivia	A radio in quechua.
English Quechua Dictionary	App that allows to translate words from English to quechua.
Warma	Oriented to the teaching and learning of language and mathematics in Quechua, aimed at children of initial and primary education of communities.
Allin Kawsay	It is an app that helps health professionals in health care and record the clinical history of quechua patients speakers.

Table 1. Quechua language Android apps in Latin America hosted on Google Play where Android-type apps are located worldwide. Adapted from: (Google Play, 2019)

Below is a table with Android apps in Ecuador's Kichwa language. The platform where apps are published is a virtual store where all users who access it can download the apps. It is on the mentioned site where all the information regarding each application that contributes to the Kichwa language was collected. The information is shown in Table 2, with the name and description of the applications.

Android App	Description
Diccionario Kichwa Unificado	It is a dictionary that allows to find the translation of words in Spanish to Kichwa and vice versa.
Kichwas	It is a translator of the Kichwa language to Spanish and vice versa, by entering words by means of keyboard and also with the use of the user's voice. In addition, it allows to translate into a third language such as the English language.
Inti	La aplicación es un chat interactivo, en el cual se tiene una conversación para practicar diálogos en diferentes idiomas: entre ellos castellano, inglés y Kichwa. The application is an interactive chat, in which you have a conversation to practice dialogues in different languages: among them Spanish, English and Kichwa.
Cancionero Kichwa Naporuna	It offers religious songs in Kichwa.
Kichwa English Dictionary	It is a dictionary that allows to find the translation of words in english to kichwa and vice versa.
Runashimi UN	It is a practice game under a cultural context, where a journey is undertaken with cultural challenges of indigenous life. The game features challenges and levels gamers until they win the game.

Wawakunapak	It is a free course with different modules to learn the language, it is mainly for children from 8 to 12 years old.
MUNA	It is an audio guide to the National Museum of Ecuador in the following languages: Spanish, Kichwa, English and French.
Kichwa de Salasaka	It shows the New Testament of the Bible in Kichwa.
Quichua de Tena	It is a Kichwa dictionary, additionally, it allows users to contribute with new words to the dictionary.
English Imbabura High Quichua	Dictionary that requires the Internet to search for English terms to Kichwa.

Table 2. Kichwa language Android apps. Adapted from: (Google Play, 2019, p.1)

The use of new technologies that arise from the technological revolution in which we live and in the face of the rise of Android applications that are most used in both tablets and smartphones. From the information obtained on Google Play where all Android type apps are hosted worldwide, it is displayed that all Android apps focused in kichwa in Ecuador are free. Therefore, everyone who has devices with Android operating system installed can access the apps at no cost.

The information shown in Table 2 indicates that there are 11 applications related to the Kichwa language, 5 are focused on the translation of the Kichwa language, 1 is a game in Kichwa, 1 guided to a language learning course, 2 are related to the religious dissemination in Kichwa and finally the last one is powered by the National Museum of Ecuador as an audio guide to the museum. Based on the data obtained, it is verified that Android apps are little exploited fields for learning Kichwa. The number of applications focused on learning are scarce.

4. The implementation of the Android Application to strengthen the kichwa learning

The development of an Android application called Kaway, in Spanish it means culture, is proposed. Through images it promotes basic elements of the Kichwa language such as colors, animals and numbers. In addition, a random trivia is added that interactively evaluates the basic elements learned.

The agile development methodology was used, which is a process that provides a structured and organized design (Matharu, Mishra, Singh, Upadhyay, 2015, pp 3-4). The stages are constituted as follows: start, to establish the vision of the application in a general way; design, design and development activities; construction, software development and finally the transition where the download of the application to customers is established (Otero Escobar, Castillo, & Díaz Camacho, 2016, p. 2).

The application developed works on the Android operating system, the software development environment used was App Inventor. This program was created by Google to create applications with Android operating system, among its main features it is a free and cross-platform software. It uses a system of blocks to create applications, additionally it has an emulator that allows to carry out tests to check the operation of the applications as if were testing them on the smartphones (App Inventor, p. 1).

Technical aspects were taken into account for the development of a mobile application; therefore, it is essential to have a smartphone where the application is downloaded in its entirety (Romero, Guanolema, Caiza, 2013, pág 2-5). The application is structured as follows, see Figure 2.
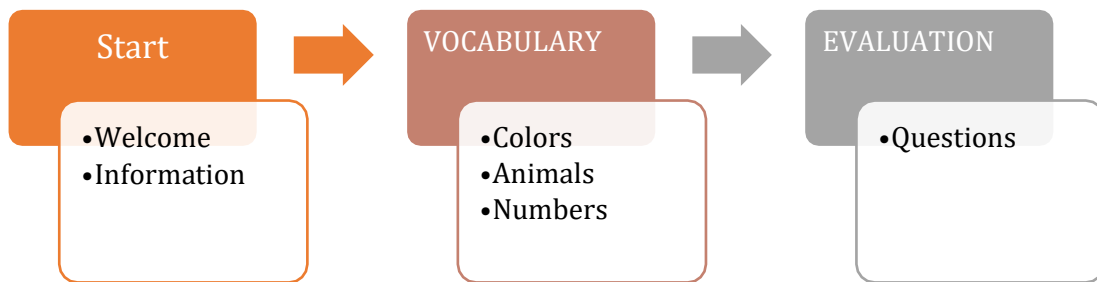

Figure 2. Kaway Android App Module

For users to access the app for free, they can access it through the Google Play store and a virtual store where apps are hosted on *Aptoide*. After downloading the Interculturality app with .apk extension that corresponds to an Android type app. Then it is proceeded with the direct installation that is performed in a few steps as shown in Figure 3.
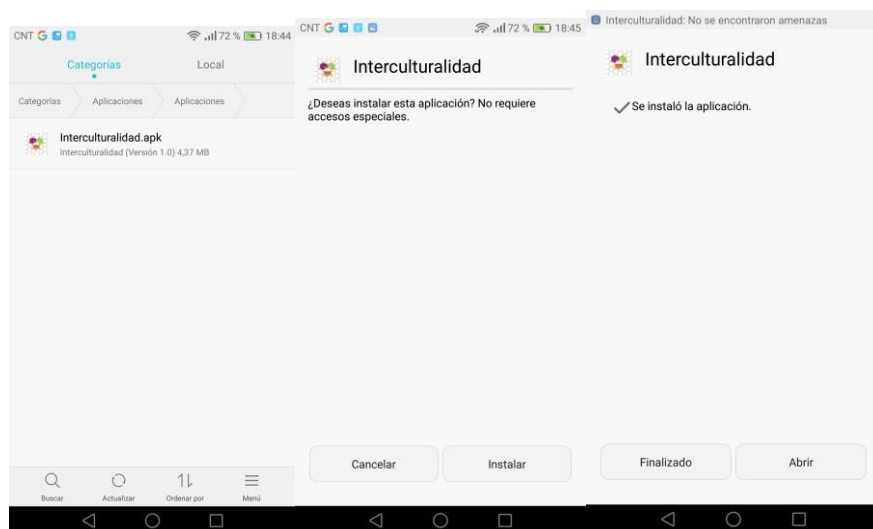
Figure 1. App installation

Operational tests were performed on each of the modules developed in Figure 4, where the welcome screen and the main menu accessed by users and the app information are displayed.
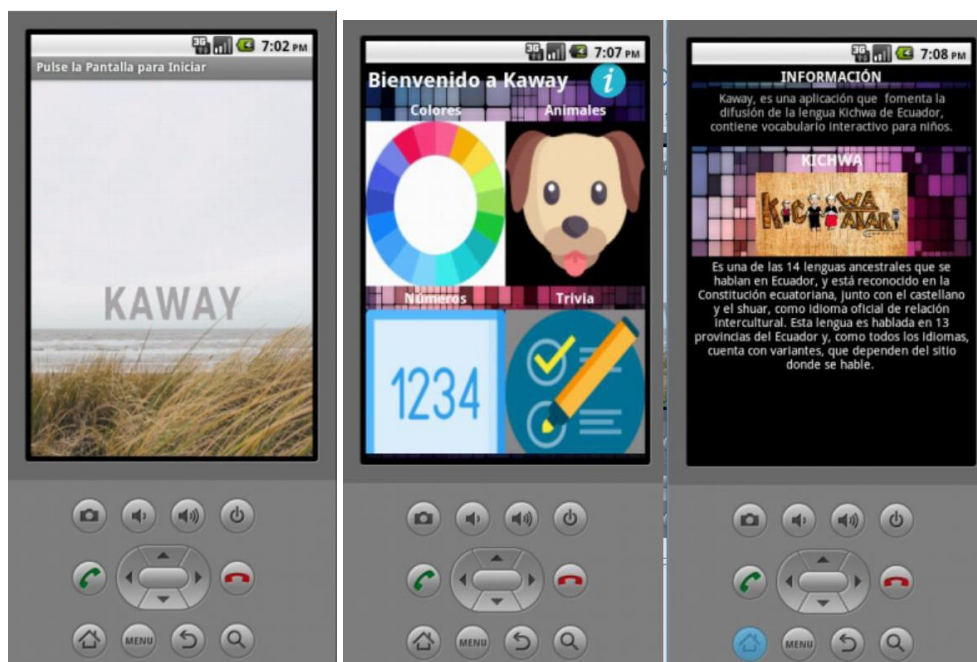
Figure 2. Welcome, main menu and information

In the next module the application has a basic vocabulary with numbers and animals to promote the Kichwa language interactively, the user visualizes images with their meaning in a fun way. The vocabulary module is displayed in Figure 5.

Figure 3. Vocabulary

Questions are asked on the interface shown in Figure 6 from what the student has practiced in the vocabulary module, the questions are presented with random answers to verify what

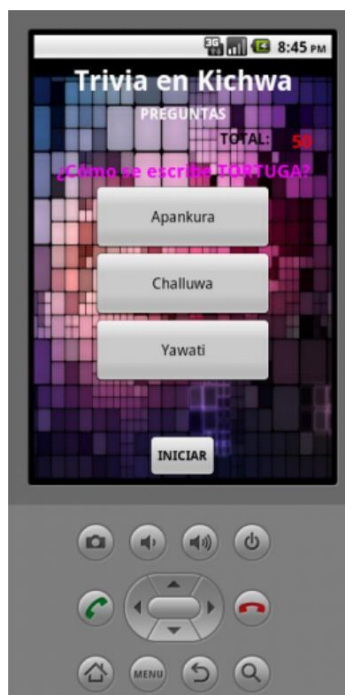the student has learned. Each time the question is answered correctly, the score is increased.

Figure 6. Kichwa Trivia

The application developed for the Android operating system is designed to be used as a mobile learning tool in the educational field. It allows to know basic elements of the Kichwa language through multimedia content to maintain the interest of users who interact with the application. The graphic environment is friendly to generate positive attention alongside a trivia which increases interest in learning and influences the motivation of students.

In addition, new technologies applied to education promote learning inside and outside the classroom; breaking the barrier of time and space where users can access the app no matter where and when they are, since the only device that is required is to have a smartphone.

5. Conclusions

The results and analysis of data presented in the implementation of applications with Android operating system takes an innovative role that quickly adapts in education, especially with technological tools like mobile learning that work on smartphones. This study determined that there are a minimum number of Android apps focused on the dissemination of the Kichwa Language in Ecuador, so it is necessary to contribute with more applications to promote the use of the language, avoiding the loss of our ancestral knowledge that is part of our culture.

The research focused its attention on Android applications due to the boom and noticeable increase of technological advancement in recent years. Mobile applications play a key role in the educational field in contributing to the teaching-learning process with quality. It is

still an extensive field for its exploitation, where the acceptance of users is evident by their friendly interfaces and their free access to most of them.

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