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Artículos científicos

Diseño de un aplicativo web para la enseñanza del idioma *kichwa*

Design of a web application for teaching the Kichwa language

Design de um aplicativo da Web para o ensino da língua Kichwa

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Resumen

La era de la globalización trajo consigo el incremento de la urbanización, pero también la desmotivación por los conocimientos, ciencias y saberes tradicionales de los pueblos y nacionalidades indígenas del Ecuador, como sucede con el idioma kichwa. Sin embargo, el uso de las nuevas tecnologías de la información y comunicación también se pueden usar para potenciar el proceso de enseñanza y aprendizaje, si se adaptan diferentes elementos formales y constitutivos del mensaje gráfico que pueden ayudar a la estética y funcionalidad de un producto web para fortalecer la cultura y la aceptación de la enseñanza de un idioma ancestral. La Universidad de Otavalo se encuentra ubicada en el cantón Otavalo, llamada capital intercultural del Ecuador por su riqueza cultural e histórica y por ser el lugar de origen del pueblo kichwa Otavalo. Teniendo en cuenta el contexto sociocultural y etnográfico poblacional de la localidad donde se asienta la



institución, el objetivo de esta investigación fue diseñar un aplicativo web para el proceso de enseñanza y aprendizaje del idioma kichwa unificado, para lo cual se contó con una serie de recursos multimedia que permitieron su visualización y escucha, apoyados en el modelo educativo de la Universidad de Otavalo y brindando una herramienta pedagógica en línea que puede proporcionar al docente la motivación para enseñar y al estudiante el interés por aprender, alcanzando la aceptación de la enseñanza de un idioma ancestral que identifica a una nacionalidad. Las bases metodológicas del estudio se corresponden con una investigación descriptiva no experimental; se aplicaron encuestas a una muestra de 70 estudiantes de la Universidad de Otavalo, de una población de 98, que cursan la asignatura Kichwa I y Kichwa II. Fue conveniente para este estudio utilizar una confiabilidad de 95 % para el cálculo del percentil correspondiente a la distribución normal, con un error máximo permisible igual a 0.05, mientras que la proporción muestral estimada, al no tener investigaciones anteriores que permitieran preestablecer este valor, fue considerada de 50 %, lo que además garantiza el máximo tamaño muestral. La fiabilidad de la encuesta medida a través del coeficiente alfa de Cronbach fue de 0.798, por lo que puede considerarse alta. Como resultado se obtuvo el diseño de un aplicativo web para contribuir al logro de una enseñanza básica, clara y amena del idioma kichwa, teniendo en cuenta que no existen suficientes estudios de alcance institucional sobre su aprendizaje y sus medios de enseñanza, valorizando el idioma y despertando el interés de los estudiantes, así como satisfaciendo la demanda de horas en la malla curricular, según criterio de los docentes de la universidad.

Palabras clave: diversidad cultural, idioma ancestral, malla curricular, oferta educativa, recurso didáctico interactivo

Abstract

The era of globalization brought with it the increase in urbanization, and this in turn the demotivation of the traditional knowledge, science and knowledge of the indigenous peoples and nationalities of Ecuador, such is the case of the Kichwa language. However, the use of new information and communication technologies stimulated the teaching-learning process, adopting different formal and constitutive elements of the graphic message, which helped the aesthetics and functionality of a web product, to prevent and strengthen culture and acceptance of the teaching of an ancestral language. The University of Otavalo is located in the Otavalo canton, called the Intercultural Capital of Ecuador, for its cultural and historical richness, and for being the place of origin of the Kichwa



Otavalo people. Taking into account the socio-cultural and ethnographic population context of the town where the institution is located, the objective of this research was to design a web application for the unified teaching-learning process of the Kichwa language, with a series of multimedia resources that allowed its visualization and listening, supported by the Educational Model of the University of Otavalo, providing an online pedagogical tool that provides the teacher with the motivation to teach and the student with the interest in learning, reaching acceptance of the teaching of an ancestral language, which identifies a nationality. The methodological bases of the study correspond to a non-experimental descriptive research, where surveys were applied to a sample of 70 students from the University of Otavalo, out of a population of 98, who study Kichwa I and Kichwa II. It was convenient for this study to use a reliability of 95% to calculate the percentile corresponding to the normal distribution, with a maximum permissible error equal to 0.05, while the estimated sample proportion, as there was no previous research that allowed to preset this value, was considered 50%, which also guarantees the maximum sample size. The reliability of the survey measured through Cronbach's Alpha Coefficient was 0.798, so it can be considered high. Thus, the result was the design of a web application to contribute to the achievement of a basic education in a clear and enjoyable way of the Kichwa language, taking into account that there are not enough studies of institutional scope on its learning and its teaching aids valuing the language and awakening the interest of students, as well as satisfying the demand for hours in the curriculum, according to the criteria of the university teachers.

Keywords: cultural diversity, ancestral language, curricular mesh, educational offer, interactive teaching resource

Resumo

A era da globalização trouxe consigo um aumento da urbanização, que por sua vez foi desmotivada pelos saberes, ciências e saberes tradicionais dos povos indígenas e nacionalidades do Equador, como é o caso da língua Kichwa. No entanto, o uso de novas tecnologias de informação e comunicação estimulou o processo de ensino-aprendizagem, adotando diferentes elementos formais e constitutivos da mensagem gráfica, que auxiliam na estética e na funcionalidade de um produto web, para prevenir e fortalecer a cultura e aceitação do ensino de uma língua ancestral. A Universidade de Otavalo está localizada no cantão de Otavalo, chamada Capital Intercultural do Equador, por sua riqueza cultural e histórica, e por ser o local de origem do povo Kichwa Otavalo. Levando em



consideração o contexto sociocultural e etnográfico da população do município onde a instituição está inserida, o objetivo desta pesquisa foi desenhar uma aplicação web para o processo de ensino-aprendizagem da língua Kichwa unificada, com uma série de recursos multimídia que permitissem a sua visualização e escuta, apoiada no Modelo Educacional da Universidade de Otavalo, proporcionando uma ferramenta pedagógica online que proporciona ao professor a motivação para ensinar e ao aluno o interesse em aprender, alcançando a aceitação do ensino de uma língua ancestral, que identifica uma nacionalidade. As bases metodológicas do estudo correspondem a uma pesquisa descritiva não experimental, onde foram aplicados inquéritos a uma amostra de 70 alunos da Universidade de Otavalo, numa população de 98, que estudam Kichwa I e Kichwa II. Foi conveniente para este estudo utilizar uma confiabilidade de 95% para calcular o percentil correspondente à distribuição normal, com erro máximo admissível igual a 0,05, enquanto a proporção amostral estimada, pois não houve pesquisas anteriores que permitissem predefinir este valor, foi considerado 50%, o que também garante o tamanho máximo da amostra. A confiabilidade da pesquisa medida por meio do Coeficiente Alfa de Cronbach foi de 0,798, portanto, pode ser considerada alta. Assim, o resultado foi o desenho de uma aplicação web para contribuir para a realização de uma educação básica de forma clara e divertida da língua Kichwa, tendo em vista que não há estudos de âmbito institucional suficientes sobre sua aprendizagem e seus auxiliares de ensino valorizando a língua e despertando o interesse dos alunos, bem como atendendo à demanda de horas do currículo, segundo os critérios dos professores universitários.

Palavras-chave: diversidade cultural, linguagem ancestral, malha curricular, oferta educacional, recurso didático interativo.

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Introduction

Ecuador is one of the countries belonging to the Andean mountain range, and is characterized by its cultural and ethnic diversity. Since the conquest of the Incas, it has inherited cultural riches, one of them the Kichwa language, which has been transmitted from generation to generation by indigenous communities. However, Spanish domination, miscegenation and globalization have caused their culture to gradually dissipate, the loss of the Kichwa language being a manifestation of this process (Pichazaca, 2017).



The Constitution of the Republic recognizes the Ecuadorian State as “intercultural, pluricultural and multilingual. In its relatively small territory, it covers 14 indigenous nationalities and 13 languages”. One of the most representative languages of this country is Kichwa, which allows the integration of new education systems that guarantee the fulfillment of rights within an “intercultural vision in accordance with the geographical, cultural and linguistic diversity of the country, and the respect for the rights of communities, peoples and nationalities”(Political Constitution of the Republic of Ecuador, Articles 66, 68, 69 and 84, numeral 11, 2008).

The Kichwa language is spoken in the inter-Andean alley from the north of Imbabura to the south of the province of Loja, and in eastern Ecuador in the provinces of Napo, Orellana, Pastaza, Morona Santiago and Zamora Chinchipe (Mejeant, 2001). As stated (Álvarez and Montaluísa, 2017), according to the population census carried out in 2010, there is a total of 591,448 Kichwa speakers nationwide, with a presence in most of the country's provinces, except in Carchi, Esmeraldas, Manabí and Morona Santiago. There are also migrant populations that settled many years ago in Guayas, El Oro, Los Ríos and Galapagos.

Ilvis (2018) certifies that "the cultural wealth of Ecuadorian nationalities is evident in each of the regions"; Despite this, Ecuador has not managed to materialize an educational offer that responds to their demands for cultural sustainability. The Ministry of Education of Ecuador (2009) states that the revaluation of ancestral languages in Ecuador is a very arduous task, which depends on factors such as the implementation of language policies that make visible and empower indigenous peoples, the change of attitude in families, so that they proudly teach their language to their children. "Whenever feasible, the children of the peoples concerned should be taught to read and write in their own indigenous language or in the language most commonly spoken in the group to which they belong" (Convention No. 169 of the International Organization of the Labor [ILO], on indigenous and tribal peoples, United Nations Declaration on the rights of indigenous peoples, 2014, p. 130)

According to Lema (1997, p. 7), the language "is considered as an instrument of communication, therefore its teaching must consist of training the people for an appropriate and effective communication, either orally or in writing." But nevertheless:

The language falls into disuse for reasons of racism and social marginalization, but also because it is not spoken by whites-mestizos, with whom indigenous people interact in markets and in similar contexts, nor is

it a language of common use in the institutions of the State, banks or other entities (Rodríguez, 2018, p. 119).

"Teaching the Kichwa language poses a didactic need to transfer knowledge, in a creative way for the new generations" (Buitrón, 2019, p. 3). Teaching models based on ICT, such as electronic learning (E-learning) and blended learning (B-learning), are generating new learning environments (virtual) that seek that the student is constantly motivated, through use of novel strategies and resources that provide the elements for some forms of communication in new and diverse didactic situations (Salinas, 1997).

E-learning is a totally distance educational modality; It is developed through the creation of flexible, open and interactive virtual environments; It has all the necessary materials for student learning and integrates interactive communication elements such as forums, chat, videoconferences, multimedia, videos, presentations and documents that guide cognitive development. It has a series of characteristics that make it an innovative teaching modality, in which the user only needs to have basic knowledge about the use of personal computers and the Internet; giving you the opportunity to access information from anywhere in the world, regardless of the time (Rojas y Bolívar, 2009).

Quispe Yucra, Urrelo Valdivia, Morales Muraña y Cariman Davis (2012) raise the importance of the use of information and communication technologies within the teaching-learning process of the Kichwa language, an alternative for the development of this mother tongue. They declare that the use of new technologies in the revitalization of indigenous languages has advantages, because it gives a social status to the language and includes it in modern media. In addition, it allows students to create their own materials and upload them to social networks. The use of technology makes the teaching of languages more interesting and dynamic, by developing processes that provide the perception of learning, as well as self-learning, allowing students to return to what they have learned as often as their curiosity deems it necessary. Likewise, the teacher looks for new strategies and relies on didactic technological resources to reach students, who, using digital platforms, access educational tools for their training.

The fact that the Kichwa language is spoken by a historically subaltern population has generated diglossic attitudes (a situation of coexistence of two linguistic varieties, where one is dominant) on the part of the sector of mestizo teachers and students, resulting in the intrinsic demotivation not only of monolingual students, but also of bilingual

Kichwa speakers. Therefore, it is important to initiate processes of animation to the study of the Kichwa language (Camas, 2016).

The Regional Office of Education for Latin America and the Caribbean (2013) states:

Education systems are called upon to experience paradigmatic changes in their current configuration, and this process will be facilitated and accelerated by the support provided by ICTs for their development. In order to develop these skills in each of its students, education in the 21st century requires a new form of school, more flexible, personalized and ubiquitous. (p. 32).

According to Sunkel and Trucco (2012), Latin America has become one of the most proactive regions in the world in relation to the integration of ICTs in their education systems, in order to contribute to social inclusion, democratization and reduction of the digital divide.

Thus, the following general research question is established: how to contribute to the strengthening of the teaching-learning process of the Kichwa language at the University of Otavalo? Therefore, taking into account the sociocultural and ethnographic population context of the town where the educational institution is located, the objective was to design a web application that strengthens the teaching and learning process of the Kichwa language at the University of Otavalo.

Description of a web application

By Mendoza and Barrios (2004)

A web application consists of internet-based software, in which a user population, through a browser, make remote requests and expect a response that may involve a mix of print publishing and software development, marketing and computing, and external relations, and art and technology (p. 81).

The technology that allows a web application to work is the internet (channel), and the support that expresses the information is the computer; the application runs in the web browser (medium) when a URL is accessed. "With a web application, the user experience will be dynamic due to the adapted design and above all, because it is developed in a language for a specific operating system" (Buitrón, 2019, p. 27). The application can be developed with a single programming language, such as HTML, JavaScript or CSS (Montiel, 2017).

Web applications focused on learning are used as transmitters of knowledge and news. In these web applications access to content is privileged; for this reason, usability and accessibility are essential (Cuello and Vittones, 2014).

There are different programs for designing a web application, one of them is Adobe XD. According to its official website (Adobe, 2020), it is clarified that this program helps to “create interactive mobile applications and website prototypes with ease. You can create and share designs for websites, mobile applications, voice interfaces, games, and much more”(p.1). This program offers the possibility of creating work tables taking into account the dimensions for the device that the application intends to use. Being a web application, its resolution is “web 1366 (1366px*768p)”.

Grammatical structure of the Kichwa language

When a certain language is spoken certain sounds are used that correspond to that language, and not to another; for example, in Spanish there are certain different sounds between the one spoken in Spain and Argentina, that is, there is phonology (Gómez et al., 2005). Phonemes as distinctive units in their oral manifestation, in everyday speech, are expressed in different ways (typical of living languages) according to the language, age, geographical area, status and time of their manifestation (Yachakukunapa shimiyuk kamu , 2009).

In the case of the Kichwa language, the correct pronunciation of the words is taught, but with regard to the variants of pronunciation in oral communication, it is almost impossible to record each and every one of them with their characteristics; here are some of the most recurrent (table 1):

Tabla 1. Algunas variaciones de la pronunciación del idioma kichwa

	LETRAS Y SU PRONUNCIACIÓN		
	Se escribe	Se pronuncia	Traducción
La "K" cuando va después de la consonante "N" se pronuncia como "G"	punku	pungu	puerta
	panka	fanga	hoja
La "LL" es pronunciada como "L"	warmi atallpa	warmi atalpa	gallina
	allpa	alpa	tierra

Fuente: Elaboración propia

The words that are used are made up of smaller elements, which combined serve to form them. The part of the grammar that studies this phenomenon is morphology (Gómez et al., 2005) (table 2):

Tabla 2. Estructura de las palabras para una oración

ESTRUCTURA DE LAS PALABRAS		
Juan	come	manzanas
nombre	verbo	sustantivo

Fuente: Elaboración propia

In Kichwa, morphology teaches the classification of words, according to the role they play in the sentence. Through the agglutinating particles that are inserted between the stem and the ending or are postponed to the words, other names are obtained, which are adjectives, verbs and adverbs, or the meaning is also changed without changing the primitive constitution (Lema, 1997). Examples of binder particles are given below by combining the word maki which means 'hand'. (table 3):

Tabla 3. Raíz y partículas aglutinantes

DIVERSAS FUNCIONES Y SIGNIFICADOS	
palabra + partícula aglutinante	significado
Maki	Mano
Makiwan	con la mano
Makikaman	hasta la mano
Makiman	a la mano
Makipi	en la mano
Makimanta	de, desde la mano
Makipura	entre las manos
Makipak	de la mano
Makikuna	Manos

Fuente: Elaboración propia

Words are spoken, but those words need to be organized according to certain rules. The part of grammar that deals with the rules that govern to structure grammatical sentences is called syntax (Gómez et al., 2005). It is the study of the internal structure of the sentence (table 4):

Tabla 4. Estructura de las palabras en un oración

ESTRUCTURA DE LA ORACIÓN		
Juan	come	manzanas
sujeto	predicado	complemento

Fuente: Elaboración propia

In Kichwa, the syntax is different from that of Spanish not only because of the binding particles, but also because of the formation and agreement in the sentences. According to the communicative and practical purpose of the speaker, each of the components of the sentence varies from place to place; that is, the subject goes first, then the complement and finally the predicate (Institute of Languages, Sciences and Ancestral Knowledge, 2016) (table 5):

Tabla 5. Estructura de las palabras en un oración kichwa

ESTRUCTURA DE LA ORACIÓN KICHWA		
Juan	come	manzanas
sujeto	complemento	predicado

Fuente: Elaboración propia

Steps for learning Kichwa basic level

It is very important to start speaking Kichwa from the first moment, which is why it is suggested to know, practice and constantly evaluate yourself. Cahuasquí (2019, unpublished) considers the following steps to follow:

Know Kichwa alphabet

An alphabet is made up of the symbols (vowels and consonants) that are used in the framework of a system that allows oral or written communication. The alphabet is considered synonymous with the alphabet because it has a succession of letters of a language. The Latin alphabet consists of 26 main letters, beginning with A and ending with Z (Pérez and Merino, 2017).

The alphabetical table of the Kichwa language, although approved by the Directorate of Intercultural Bilingual Education (DINEIB) with 20 spellings (3 vowels and 17 consonants), is an open topic because the spellings ts and z are used in certain localities such as the province of Imbabura for certain prekichwa words (table 6):

Tabla 6. Vocales y consonante del alfabeto kichwa

VOCALES
a, i, u
CONSONANTES
ch, h, k, l, ll, m, n, ñn, p, r, s, sh, t, ts, w, y, z

Fuente: Elaboración propia

The definitive officialization of the Kichwa alphabet occurs on September 16, 2004 under Ministerial Agreement No. 244, this recognition being the result of hard work by educational actors, linguists, indigenous organizations, among others, admitting the use of the spelling h instead of j, being established as follows: a, ch, i, h, k, l, ll, m, n, ñ, p, r, s, sh, t, (“ts”), u, w, y (z) (Cahuasquí, 2017, unpublished).

The spellings that make up the alphabet when they become a word have a bass prosodic accent, which means that when a word is brought together, the voice accent will travel to the penultimate syllable to comply with this rule. That the Kichwa language is an agglutinant means that new compositions can be created from a base word or its root with the adhesion of morphemes, resulting in new meanings (Cahuasquí, 2019, unpublished).

Know verb and conjugation

The verb is the word that expresses action, and in Castilian those words end in – ar, –er, –ir. This means that any verb is divided into two parts: the verb stem and the verb ending. In the Kichwa language, all verbs have a single ending, which is –na (Paza, 2011) (table 7).

Tabla 7. Comparación de la estructura del verbo en castellano y kichwa

VERBO	
en castellano	en kichwa
ar - er - ir	Na
ejemplo verbo	
vivir	Kawsana
caminar	Purina
comer	Mikuna
raíz verbal + terminación verbal	raíz verbal + terminación verbal
viv + ir	kawsa + na
camín + ar	puri + na
com + er	miku + na

Fuente: Elaboración propia

In Kichwa, regardless of any tense, there is only one way to conjugate verbs. The root remains unchanged in all modes, times and people. For the conjugation of a verb, a pronoun, the verb stem and the ending of time are needed (Paza, 2011) (tables 8 and 9):

Tabla 8. Pronombres en castellano y kichwa

	PRONOMBRES					
	Singular			plural		
	1. ^a p.	2. ^a p.	3. ^a p.	1. ^a p.	2. ^a p.	3. ^a p.
en castellano	yo	tú / usted	él, ella	nosotros	ustedes	ellos
en kichwa	ñuka	kan / kikin	Pay	ñukanchik	kikinkuna	Paykuna

Fuente: Elaboración propia

Tabla 9. Comparación de las partes de una conjugación en castellano y kichwa

		CONJUGACIÓN		
		pronombre	raíz verbal	terminaciones verbales del presente
		+	+	
encastellano	1. ^a p	yo	camín	O
en kichwa		ñuka	puri	Ni
	2. ^a p	tú / usted	camín	as /a
		kan / kikin	puri	Nki
	3. ^a p	él / ella	camín	A
		pay	puri	N
	1. ^a p	nosotros	camín	Amos
		ñukanchik	puri	Nchik
	2. ^a p	ustedes	camín	an
		kikinkuna	puri	nkichik
	3. ^a p	ellos	camín	an
		paykuna	puri	n

Fuente: Elaboración propia

Know the structure of a Kichwa grammar sentence

The three components found in the grammatical structure of a sentence are subject, complement, verb (S + C + V +). Subject is called the person, animal or thing that performs the action of the verb; it can be represented by pronouns, nouns or a structure that fulfills the function of the nucleus. The predicate is the constituent of the

sentence that offers information about the subject. We call all the elements in the predicate, with the exception of the verb, complements (Institute of Languages, Sciences and Ancestral Knowledge, 2016) (table 10):

Tabla 10. Comparación de una oración en castellano y kichwa

	ORACIÓN		
en castellano	S +	V +	C
	Yo	soy	María
en kichwa	S +	C +	V
	Ñuka	María	Kani

Fuente: Elaboración propia

The subject of a grammatical sentence in the Kichwa language will be identified with the morpheme *ka*, which will be postponed to the pronoun, proper nouns or common nouns. The complement will be identified with the use of the morpheme *mi*, which if used together with other morphemes will always go at the end of the base word and after any other morpheme. The purpose of its use is to affirm, reaffirm or attest to the idea that is to be transmitted, and it is the reason why it can be added or postponed to the subject, complement or verb. However, for the present study it will be used in the complement to avoid confusion (Cahuasquí, 2019b, unpublished). Example of a correct sentence (table 11):

Tabla 11. Oración kichwa con morfemas *ka* y *mi*

S +	C +	V
Ñukaka	María tiyami	kani

Fuente: Elaboración propia

Know the subject

It will be identified with the morpheme *ka*, and has two meanings, among others:

1. Morpheme *-ka* used with pronouns and proper nouns: in this case the morpheme *-ka* is not translated, it is simply an identifier of the subject (table 12).

Tabla 12. Morfema *ka* con pronombres y nombres propios

	MORFEMA "KA" EN EL SUJETO PRONOMBRES Y NOMBRES PROPIOS		
en kichwa	S +	C +	V
	Kikinka	Quito llaktapimi	Kawsanki
en castellano	S +	V +	C
	Usted	vive	en Quito

Fuente: Elaboración propia

2. Morpheme *-ka* used with common names: in this case it functions as a subject and at the same time as articles (el, la, los las) that the Kichwa language does not have as such (table 14):

Tabla 13. Morfema *ka* con nombres comunes

	MORFEMA "KA" EN EL SUJETO NOMBRES COMUNES		
en kichwa	S +	C +	V
	Wasika	hatunmi	kan
en castellano	S +	V +	C
	La casa	Es	grande

Fuente: Elaboración propia

Know the complement

Cahuasquí (2019c, sin publicar) maintains that the use of the morpheme *mi* is indistinct; It can go in the subject, complement or verb, so it is concluded that it is an emphasizing morpheme, as it is used to affirm, reaffirm or attest to the idea that is to be transmitted through a word, expression or grammatical sentences; however, it is advisable to use the plugin identifier to avoid confusion (Table 14):

Tabla 14. Morfema *mi* en la oración

MORFEMA "MI" ENFATIZADOR EN EL SUJETO			
en kichwa	S +	C +	V
	Paymi	Juan tiyu	kan
en castellano	S +	V +	C
	Él	Es	Juan
MORFEMA "MI" ENFATIZADOR EN EL COMPLEMENTO			
en kichwa	S +	C +	V
	Payka	Juan tiyumi	kan
en castellano	S +	V +	C
	Él	Es	Juan
MORFEMA "MI" ENFATIZADOR EN EL VERBO			
en kichwa	S +	C +	V
	Payka	Juan tiyu	kanmi
en castellano	S +	V +	C
	Él	Es	Juan

Fuente: Elaboración propia

It should be noted that the use of the morpheme *mi* has a very important cultural meaning that little by little has been lost from generation to generation. Previously in the Kichwa culture the morpheme *mi* was related to the truth; the person who used the morpheme *mi* emphasized a word, a sentence, an expression through which he wanted to highlight a truth. This was so because the word was like law and as such it had to be observed. At present one is not aware of the transcendental meaning of the morpheme *mi*. In case of using other morphemes, the *mi* will always go at the end (table 15):

Tabla 15. Morfema *mi* y morfema *pi*

MORFEMA "MI" ENFATIZADOR CON OTRO MORFEMA			
en kichwa	S +	C +	V
	Juanka	Otavaló llaktapimi	Kawsan
en castellano	S +	V +	C
Juan vive en Otavaló			

Fuente: Elaboración propia

Know the verb

The verb will be recognized by the proper endings of a conjugation and can vary according to the conjugation time (table 16):

Tabla 16. Conjugación del verbo (...) en diferentes tiempos

PERSONA			TIEMPO / PACHA				
			PRESENTE	PASADO	P. PASADO	FUTURO I.	FUTURO M.
1°	Ñuka	singular	... + ni	... + rka + ni	... + shka + ni	... + kri + ni	... + sha
2°	Kan/K.		... + nki	... + rka + nki	... + shka + nki	... + kri + nki	... + nki
3°	Pay		... + n	... + rka	... + shka	... + kri + n	... + nka
1°	Ñukanchik	plural	... + nchik	... + rka + nchik	... + shka + nchik	... + kri + nchik	... + shun
2°	Kikinkuna		... + nkichik	... + rka + nkichik	... + shka + nkichik	... + kri + nkichik	... + nkichik
3°	Paykuna		... + n	... + rka	... + shka	... + kri + n	... + nka

Fuente: Elaboración propia

For the design of a web application proposal, a specialized methodology in application design is used. The development of an application, from the idea until it ends on the users' devices, is divided into several steps that can vary according to time, budget and company culture. It should be clarified that there is no correct and formal way to make an application. The reality is too changing and we must be fast enough to adapt to the market and be the ones who create a trend and not the ones who follow it (Montiel, 2017).

Materials and methods

The methodological structure in the development of the research is oriented according to the following aspects in descending order:

- The research meets the criteria of a non-experimental descriptive research, so the variables are not deliberately manipulated. The methodological bases of the procedure used correspond to the support of the research tools and techniques. In accordance with the pre-established objective, the research was developed during the 2018-2019 school semesters, a period in which a historical enrollment of students was reached to take Kichwa I and II at the University of Otavalo.
- The type of research carried out determined a descriptive, qualitative and quantitative field study. It was considered from the field because a detailed study was carried out, in the compilation of information necessary for the development of the web application; descriptive because the criteria of students were determined, as well as the considerations of a specialist teacher in Kichwa language; qualitative because it is proposed to evaluate and interpret information obtained through resources such as interviews, and quantitative because of the use of statistical tools in the processing of surveys to collect the results.
- A survey was developed according to the consensus of experts selected through the Kendall W test (Hurtado, 2007). Additionally, an interview was elaborated whose pattern focused on relevant aspects obtained by the authors, through the analysis of primary and secondary information documents. The statistical processing of the survey results was basically carried out by means of frequency tables and graphs. According to information from the Department of Academic Secretary of the institution, the students who receive the Kichwa I and II subjects are a total of 98. The responses to the survey questions were all measured on a Likert scale of five answer alternatives. The sample size is calculated according to the following formula, which is the one corresponding to a probability sampling where the response proportions are required (Hernández, Fernández y Baptista, 2014).

$$n = \frac{k^2 * p * q * N}{(e^2 * (N - 1)) + K^2 * p * q}$$

The elements of the formula are:

n = size of the sample sought

N = population size

k = statistical parameter that depends on the confidence level (90%)

e = maximum accepted estimation error

p = probability of the event being studied (success)

$q = (1-p)$ = probability that the event studied does not occur

The survey consisted of eight questions associated with the importance that students attach to the use of virtual platforms in the teaching of the Kichwa language to stimulate their comprehensive learning and training. The SPSS version 21 statistical package was used. A total of 70 students from a population of 98 were surveyed. It was convenient for this study to use a reliability of 95% to calculate the percentile corresponding to the normal distribution, a maximum permissible error equal to 0.05, while the estimated sample proportion, as there was no previous research that allowed this value to be preset, was considered 50%, which also guarantees the maximum sample size. The reliability of the survey measured through Cronbach's alpha coefficient was 0.798, so it can be considered high.

The 70 students surveyed are representative of the 98 who are learning Kichwa at the University of Otavalo, ensuring that all students selected at random have an equal chance of being included in the sample obtained.

The teaching of the Kichwa subject is organized into six groups of students from urban and rural communities of the canton Otavalo, Atuntaqui and Cotacachi, these being the most significant. The ages of the students range from 22 to 28 years old. The groups have a mixed ethnic composition, that is, there are mestizos and Kichwa Otavalo students, although the dilemma is faced that, being some of the Kichwa Otavalo ethnic group, very few speak their mother tongue, but do not write it and the vast majority He cannot communicate, but they are interested in mastering it, and there are 15 Kichwa Otavalo students who are fluent in English.

In Figure 1, the percentage results are displayed according to the survey questions. The importance of promoting the learning of Kichwa at the University of Otavalo is supported by the criteria of more than 70% of the students. On the other hand, 39.1% say they are neutral, conditioned by their ignorance of the benefits of a web application as didactic material, which motivates interest in learning the language, with information and

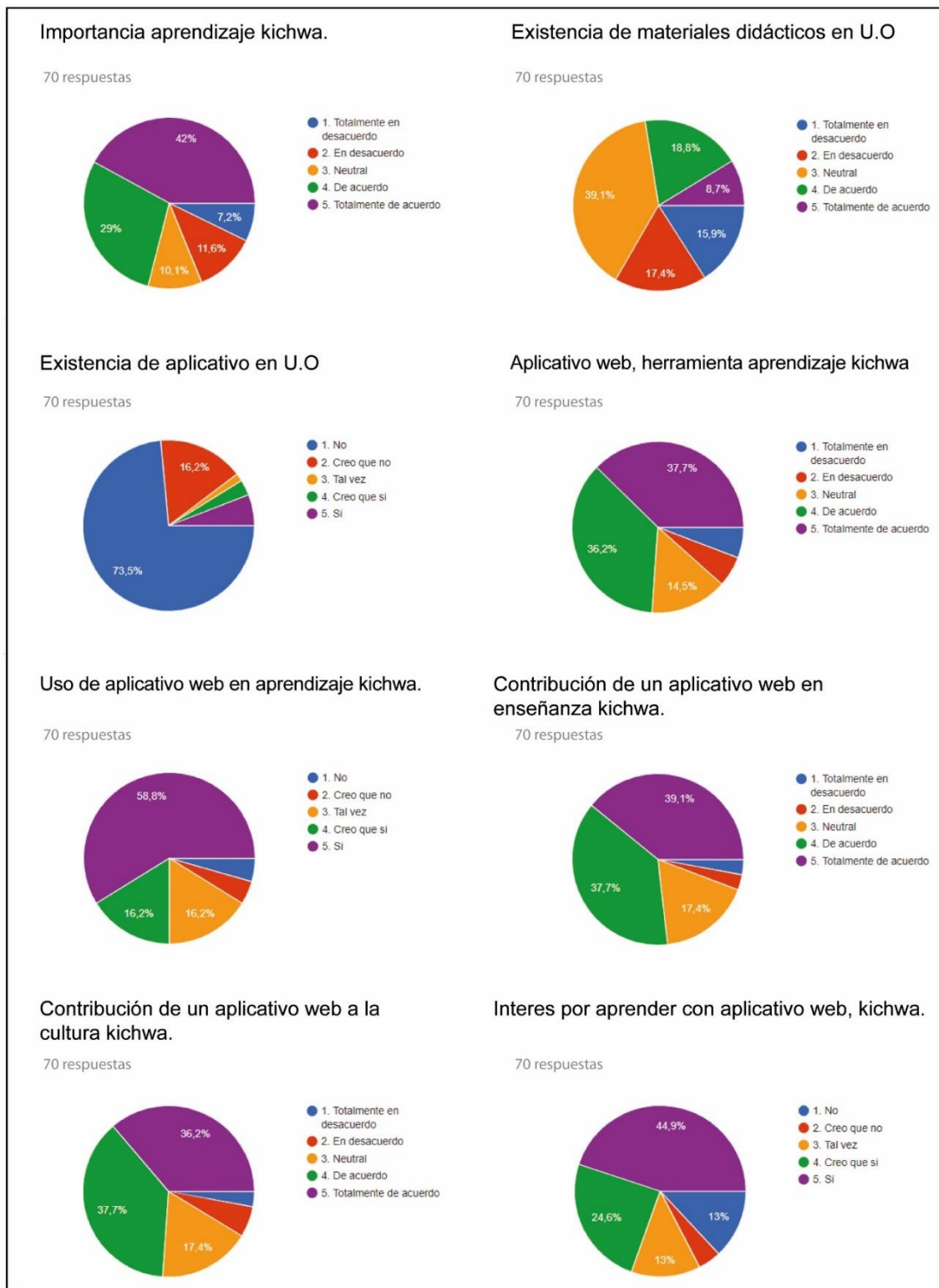
communication technologies, although it should be noted that the University classrooms are equipped with all the necessary technology for the use of this didactic resource.

However, when inquiring about the importance of the web application as a learning tool, within the institution most students (74%) agree or totally agree with its design, as a tool with advantages for learning the Kichwa language inside and outside the institution. On the other hand, 75% of those surveyed state that they would use a web application oriented to learning the Kichwa language, and approximately 77% would use it because they consider that it will contribute to the general learning and training of students.

It is necessary to take into account the intercultural and ethnic context of the Otavalo canton, the cradle of the Kichwa Otavalo ethnic group, where the aforementioned university is located, a bilingual higher education institution that trains Kichwa Otavalo professionals, among others, in charge of valuing their cultural heritage. Consequently, 74% of students believe that if a web application is implemented to teach the Kichwa language at the university, it contributes to the development of Kichwa nationality. Taking this analysis into account, it is concluded that a web application for the teaching of the Kichwa language causes a cultural impact of an entire nationality that is dispersed throughout the country and will contain the unified Kichwa grammar, which will be obtained by the theoretical foundation of several authors and government entities that add to its learning process (see figure 1).

To complement the research, a semi-structured interview was conducted, considering that this type of instrument offers an acceptable degree of flexibility, while maintaining sufficient uniformity to achieve interpretations consistent with the purposes of the study (Díaz, Torruco, Mildred & Varela, 2013). Specifically, a questionnaire with five questions was developed according to the main research question and the stated objective, and it was applied to the director of the Language Department, a professional with high expertise in the teaching of the Kichwa language, belonging to the Kichwa community Otavalo and recognized by the student and university community for its investigative works presented at national and international events.

Figura 1. Resultados de la encuesta aplicada



Fuente: Elaboración propia

It was determined that the teaching of the Kichwa language at the University of Otavalo is necessary because the institution has declared itself intercultural since its inception, it is also located in a strategic area where more than 50% of the indigenous

population speaks the Kichwa language. Therefore, it is important that the student master the language due to the services that they will provide in the future as professionals.

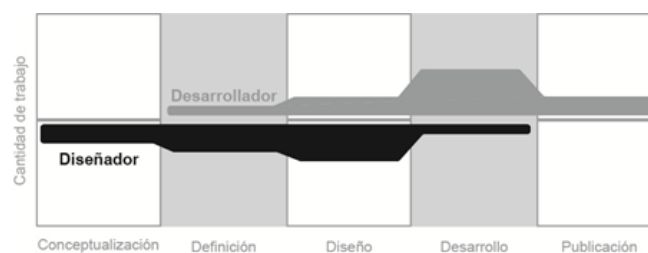
In addition, the absence of didactic material such as books and notebooks on learning the Kichwa language is declared, so that a technological material such as a web application would define the logical sequence for mastering the language. On the other hand, it is necessary to extend the hours in the curriculum of the Kichwa subject because the 32 that are taught in the semester are insufficient.

Results

App design process

The phases of this process, from a design and development perspective, have been summarized in Figure 2:

Figura 1. Metodología aplicada de diseño



Fuente: Cuello y Vittones (2014)

The specialized methodology for applications of Cuello and Vittones (2014) is used, which has been adapted to this research. The problem it solves is adjusted to the need to meet the demand for interactive teaching material for learning the Kichwa language, contributing to the maintenance of words that in this language contain cultural meanings such as customs, practices, rituals, ways of being, types of clothing. and other components that form a social fabric called culture.

Formalization of the idea

By having significant user data, the first functionalities of the application will be devised, which are divided into two phases:

Hypothesis generation

Thanks to some interviews with users, we know that most of them are frustrated not to know a web application for learning the Kichwa language; Therefore, we believe that by designing a specific application for learning —with a user interface that organizes academic content in a metaphorical way in which Andean culture is associated with Kichwa grammar to create an aesthetic concept that is easy to understand by anyone. type of user— it will help the learning of the Kichwa language, in addition we will gain acceptance and awaken interest in the Kichwa culture.

Sketch and Concept Design

Organization of the contents: This section refers to the comprehension of the texts by means of readability and readability. Correct readability is based on the number of syllables per word and the number of words per phrase. Paragraphs that contain few sentences are used because it will be easier to understand. To understand the text, convenient titles, logical arguments and short phrases that will be related to the concept of the application are used. The conceptual complexity of the contents and its relationship with the preparation of the reader who will face them will also be considered.

User-Centered Design: This section focuses on the signifier, meaning and referent, linguistic signs that come together in the brain to give an associative link.

Pictograms: This section focuses on the design of graphic symbols for the information and operation of the web application. The design of symbols for public information requires that the meaning of the symbols be apparent without learning. Therefore, icons designed and established throughout the digital age will be used that will facilitate the cognitive process of users.

Defining users

In this stage, models or user archetypes are defined for which it is designed taking into account their needs and objectives. The tool called persona is used, which consists of a singular and fictitious representation of a key segment of the target audience. It will have a face, name, history, needs, and goals.

Functional definition

All the actions and interactions that are necessary for a user to achieve their goal are translated into functions that the application must have. With the user's journey, it is possible to detect what the needs are in each stage and what tools it requires to be able to advance to the next.

User test

The test that was chosen to obtain information from users was a guerrilla test, which consists of bringing together a certain number of people to test the application with the main objective of seeing how they behave and collecting data that allows correcting errors.

The number of volunteers ranged from five to eight people, since with this number almost all of the most common usability problems can be detected. The place where it took place was in the classrooms of the University of Otavalo, because it is a quiet place, equipped with digital whiteboards, where there are no interruptions and it is the most realistic scenario where the application will be used. In annexes the visual and functional design of the web application for learning the Kichwa language is added (see annexes I-XX).

Discussion

Language is the living heart of a culture. Historically, in the public education system of Ecuador, ancestral languages have not been taken into account. The creation of the National Directorate for Intercultural Bilingual Education, protected in Official Registry No. 278 of September 17, 1993, imposed awareness of the patrimonial languages of the different Ecuadorian nationalities. The teaching of ancestral languages, in this case Kichwa, has had weaknesses in its methodological conception, since it has not had the experience of treating them in a school environment and they have not entered the field of literacy in the same way as the languages that have a long tradition in this field (Calderón, 2012; Contreras, 2010).

The current context, characterized by a greater accumulation of possibilities of massive access to a broader body of knowledge produced by man, is identified by the ability to search, systematize, understand, organize and mainly use the information accessed by means of technologies to produce new knowledge, and that peoples can count on cognitive tools and skills that allow to act critically, creatively, reflectively and

responsibly on the abundance of data to apply it to various contexts and learning environments, as well as to build relevant knowledge based on them (Aguerrondo, Grinberg, Lugo, Marchesi y Ortega, 2006).

By Vallejo (2010), a process of integration of information technologies in education is aimed at aspects such as education, training children, youth and teachers in new learning and cooperation environments; of territorial integration, with the establishment of a public infrastructure of networks that articulate the local community in provincial, national, regional and global instances; administrative modernization, computerizing communication, administration and management of central and zonal agencies and school institutions; of social development, with the constitution of new spaces and learning opportunities for different audiences through continuous training and professional / labor requalification through distance education and the creation of virtual learning communities. Therefore, this analysis proposal is based on the bases of the incorporation of ICT in education as part of a comprehensive State policy, which also involves the areas of health, social security, justice, work and culture, among others (Guerrero and Dotes, 2012).

The proposal for a web application was born from the need to preserve and learn an ancestral language. However, the research showed limitations motivated by the lack of knowledge of adequate computer methodologies and techniques for learning Kichwa. Furthermore, and despite the fact that the University of Otavalo has been taught as a subject since 2004, there is no evidence of their use in the teaching process; For this reason, the incorporation of the designed application into the teaching and learning process, and according to the results of the student survey, will have a sociocultural impact of national significance, this type of initiative arouses interest in cultivating, even if the student or person not part of a bilingual institution. In addition to this, the learning flow is facilitated by the use of multimedia resources that arouse interest, motivation and attention while meeting the demand for interactive teaching material for learning the Kichwa language in bilingual educational institutions.

The strength of the web application for learning the unified Kichwa language is its methodological utility, since future research using compatible methodologies can be carried out, so that joint analyzes will be carried out between institutions and researchers related to the subject of comparisons between specific time periods. and assessments that were being carried out for learning the Kichwa language.

Conclusions

The web application demonstrates that its use contributes to the enhancement of learning the Kichwa language and that didactic materials can be created on different platforms with the collaboration of a work team that will cover all phases of pre-production, production and post-production.

For this, of course, the correct organization of the grammatical information of that language is essential. Then the student --on the completion of her study hours imposed by the institution's curricular network— will be able to use the web application in her free time for 30 minutes a day, enough time to acquire the “working memory” useful for learning. If the minutes per week are calculated, the result is 3:30 hours plus the hours of study at the university are 5:30 hours. This is the minimum estimate, since the application can be used without a time limit, hence the main variant lies in the interest of the student. Researchers have the criteria that designing a specific application for learning with a user interface that organizes academic content in a metaphorical way, in which Andean culture is associated with Kichwa grammar to create an aesthetic and easy to understand by any type of user, it will help the learning of the language, and will achieve acceptance and awaken interest in that culture in the new generations.

Facing alternatives for academic improvement, considering the educational inclusion and the effect on the learning of the Kichwa language of the Andean peoples, causes rethinking in future research for the defense and sustainability of the expressions of the ancestral national cultures (autochthonous), since it represents a wealth of heritage knowledge that must be protected; otherwise, it will be leading to poor levels of social cohesion and loss of traditions, culture and socio-community identity.

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Validación	Alberto Cahuasquí
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Investigación	Alberto Cahuasquí
Recursos	Alberto Cahuasquí
Curación de datos	NO APLICA
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Escritura - Revisión y edición	Alberto Cahuasquí
Visualización	NO APLICA
Supervisión	Alberto Cahuasquí
Administración de Proyectos	Alberto Cahuasquí
Adquisición de fondos	NO APLICA

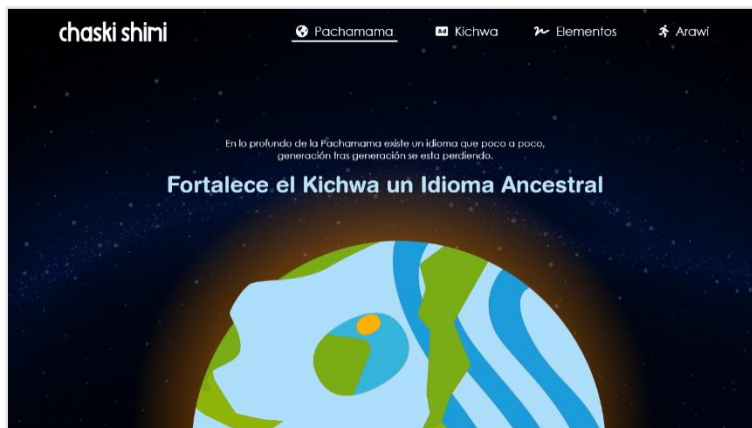
ANEXOS

Anexo 1. Pantalla de inicio



Fuente: Elaboración propia

Anexo 2. Portal I



Fuente: Elaboración propia

Anexo 3. Ventana kichwa



Fuente: Elaboración propia

Anexo 4. Ventana Elementos

chaski shimi Pachamama Kichwa Elementos Arawi

LOS ELEMENTOS DE LA PACHAMAMA EN LA GRAMÁTICA KICHWA

Aire I
Hay ciertos sonidos que caracterizan a una lengua y su correcta pronunciación es importante, quien nos ayuda a estudiar estos sonidos y sus reglas de combinación es la **fonología**.

Agua II
Las palabras que utilizamos están formadas por elementos más pequeños que, combinados, sirven para formarlas. La parte de la gramática que estudia este fenómeno es la **morfología**.

Tierra III
Hablamos con palabras, pero esas palabras necesitan organizarse según ciertas reglas. La parte de la gramática que se ocupa de las reglas que rigen para estructurar las oraciones se denominan **sintaxis**.

Fuego IV
La **estructura gramatical** es la forma en que las palabras se unen y se cambian para formar oraciones y expresar diferentes significados, estas palabras son el sujeto, complemento y verbo, junto con partículas aglutinantes.

Fuente: Elaboración propia

Anexo 5. Ventana Arawi

chaski shimi Pachamama Kichwa Elementos Arawi

EL CHASKI SHIMI MENSAJERO DE LA LENGUA

Arawi
Es el Arawi el chaski shimi, es el único chaski especializado en el idioma Kichwa. La llegada de Arawi a esta aplicación fue importante por los conocimientos que posee.

Pututu
Arawi lleva siempre consigo un pututu, trompeta de caracol, para anunciar su llegada e informar todas las reglas gramaticales del idioma Kichwa.

Formación
Fue entrenado para correr por montañas, ríos y selvas con el fin de transmitir mensajes sobre el aprendizaje del idioma Kichwa. É le ayudara a recorrer por los 4 elementos de la gramática Kichwa.

Chuspa
También lleva consigo un atado o bato en todo su tronco donde conduce libros y apuntes para el aprendizaje del idioma Kichwa

Mensajes
La palabra del chaski es la ley, el no miente. Cada mensaje lo repite varias veces en voz alta, debes prestarle atención. Él te ayudara en todo el recorrido de los elementos gramaticales.

Significado
"Arawi" significa esencia del arte y de la lengua, la sagrada fuente del conocimiento runa

Fuente: Elaboración propia

Anexo 6. Pop Up

chaski shimi

La nacionalidad Kichwa quiere conocerte

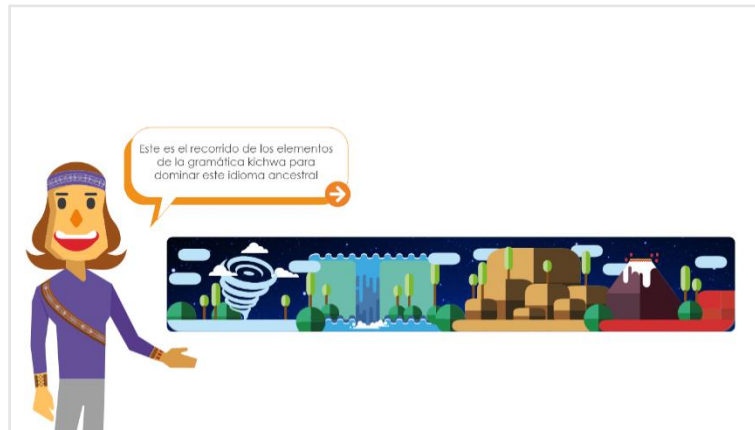
CREAR PERFIL

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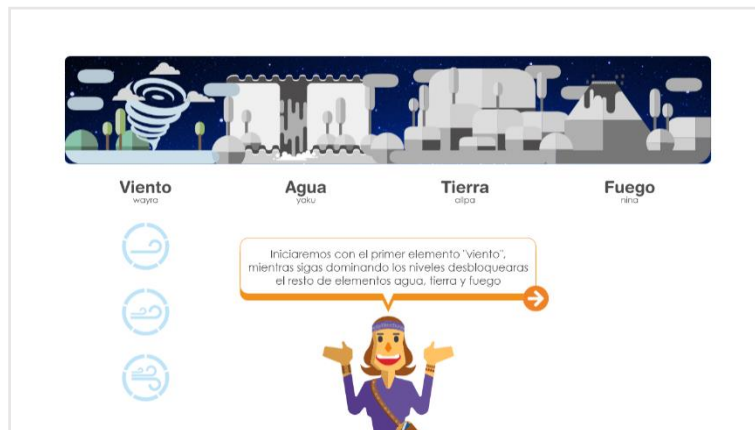
Fuente: Elaboración propia

Anexo 7. Recorrido interfaz gráfica



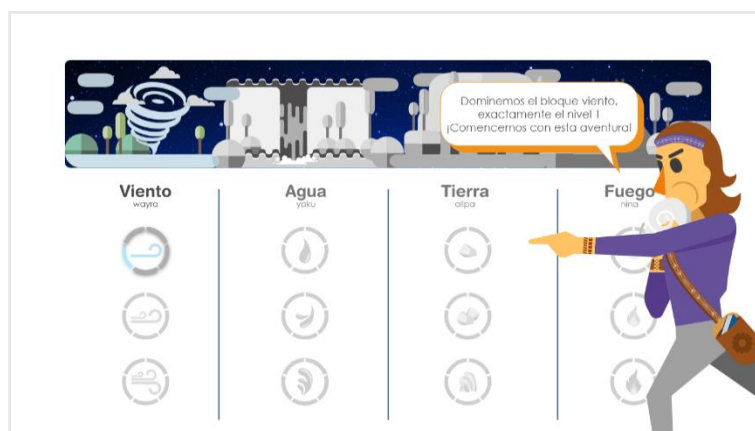
Fuente: Elaboración propia

Anexo 8. Recorrido interfaz gráfica



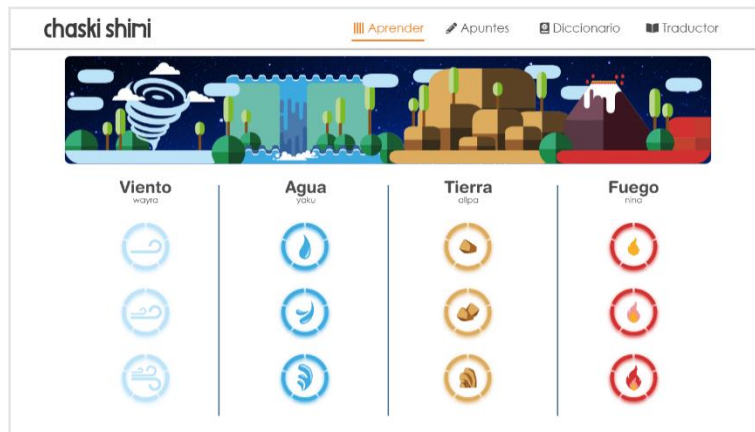
Fuente: Elaboración propia

Anexo 9. Recorrido interfaz gráfica



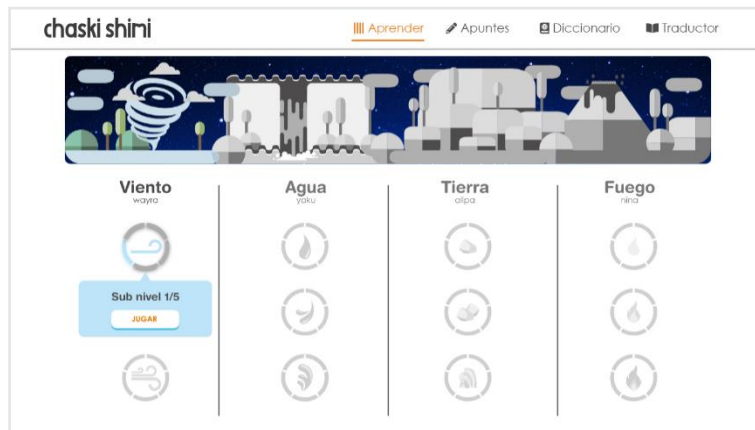
Fuente: Elaboración propia

Anexo 10. Portal II



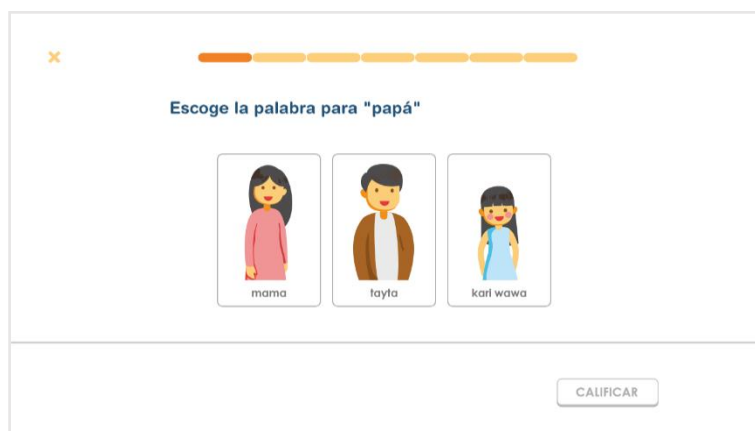
Fuente: Elaboración propia

Anexo 11. Inicio de ejercicios



Fuente: Elaboración propia

Anexo 12. Ejercicio 1




Fuente: Elaboración propia

Anexo 13. Ejercicio 1 (incorrecto)

x

Escoge la palabra para "papá"



mama



tayta



kari wawa

INCORRECTO

REPETIR

Fuente: Elaboración propia


Anexo 14. Ejercicio 1 (correcto)

x

Escoge la palabra para "papá"



mama



tayta



kari wawa

CORRECTO

papá = tayta
 madre = mama
 niña = kari wawa

CONTINUAR

Fuente: Elaboración propia

Anexo 15. Ejercicio 3

x

Escucha y selecciona la palabra en kichwa

grande

hatun

uchilla

hawa

CALIFICAR

Fuente: Elaboración propia

Anexo 16. Ejercicio 3 (correcto)

The screenshot shows a language exercise interface. At the top, there is a progress bar with 10 segments, the first 5 being orange and the last 5 being yellow. Below the progress bar, the text reads "Escucha y selecciona la palabra en kichwa". A speaker icon is followed by the word "grande". Below this, there are three buttons: "hatun", "uchilla", and "hawa". The "hatun" button is highlighted with a white border. At the bottom, a green bar contains the text "CORRECTO" with a green checkmark, a list of translations: "grande = hatun", "pequeño = uchilla", and "hawa = arriba", and a "CONTINUAR" button.

Fuente: Elaboración propia

Anexo 17. Ejercicio 3 (incorrecto)

The screenshot shows a language exercise interface. At the top, there is a progress bar with 10 segments, the first 5 being orange and the last 5 being yellow. Below the progress bar, the text reads "Escucha y selecciona la palabra en kichwa". A speaker icon is followed by the word "grande". Below this, there are three buttons: "uchilla", "hatun", and "hawa". The "uchilla" button is highlighted with a white border. At the bottom, a red bar contains the text "INCORRECTO" with a red circle and a "REPETIR" button.

Fuente: Elaboración propia

Anexo 18. Ejercicio 7 (retroalimentación)

The screenshot shows a language exercise interface. At the top, there is a progress bar with 10 segments, the first 5 being orange and the last 5 being yellow. Below the progress bar, the text reads "Arrastra las palabras de castellano a kichwa en orden". There are two rows of buttons. The first row contains six buttons: "tayta", "allku", "hatun", "ankana", "allichina", and "asina". The second row contains six buttons: "volar", "perro", "reir", "papá", "arreglar", and "grande". The "perro" button is numbered 2, "volar" is 1, "reir" is 3, "papá" is 4, "arreglar" is 5, and "grande" is 6. At the bottom, there is a "CALIFICAR" button.

Fuente: Elaboración propia

Anexo 19. Ejercicio 7 (retroalimentación correcto)

x

Arrastra las palabras de castellano a kichwa en orden

taya alku hatun ankana allichina asina
papá perro grande volar arreglar reir

Tus respuestas son correctas

CONTINUAR

Fuente: Elaboración propia

Anexo 20. Fin de ejercicios

¡Excelente! Lección completada
estas a 4 pasos de terminar un nivel

Fuente: Elaboración propia