

## **Nik'adh duche': Web application for the learning of the Tének alphabet**

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Received June 30, 2016; Accepted September 30, 2016

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### **Abstract**

According to the latest report of the regional educational situation (OREALC / UNESCO, 2013), the problems of inequity, poor quality and poor performance of school systems continue to affect more strongly to people living and working in rural areas. Currently in Mexico there are 68 indigenous people, whose communities have cultural traits, own native languages and forms of organization; there are 25 indigenous regions identified in 20 states of the country. According to data from INEGI, in Mexico there are 85 languages including Tének, among which there are 161,120 speakers of this language. This language, based on the statistical comparison of different census, shows that is decreasing in the number of speakers (INEGI, 2010). The main reason behind Nik'adh Dhucho' is that most Tének speakers do not read or write in the language, but have an interest in learning, both grammar and phonetics. The initial proposal is in order to preserve this language, through learning of it using interactive online tools that allow learning the alphabet using games and activities in which the user will work in a dynamic and fun way, no matter the location, as it can be accessed from any device with Internet connection.

The development of projects such as this allows the use, learning and preservation of a language while maintaining a greater presence on the Internet. This project is funded by the program Educational Equity and Inclusion 2015.

### **Indigenous languages, Tének, Web application, learning, Educative technology**

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**Citation:** JIMÉNEZ, Rosa, HERNÁNDEZ, Dalia, ZAPATA, Nitgard and MARTÍNEZ, Verónica. Nik'adh duche': Web application for the learning of the Tének alphabet. ECORFAN Journal-Spain 2015, 3-5: 14-20

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## Introduction

The new information and communications technology create conditions for the emergence of knowledge societies, gaining a real sense in providing its service to a wider end, it is a source of global development and especially for the least developed countries. To achieve this, access to information is required so that it can produce, process, transform, disseminate and use information in order to create and apply knowledge necessary for human development. (United Nations Organization for Education, Science and Culture, 2005).

"Human development" and "autonomy" knowledge societies enhance the practice of universal rights and fundamental freedoms, while optimizing the efficiency of the fight against poverty and development policies.

Statistics from the International Telecommunication Union (ITU) estimate that 46.3% of the world population has Internet access, for America 60% of the population has access to this service so the representativeness of the population connected to the Internet decreases as the economic status of the country (ITU World Telecommunication / ICT Indicators database, 2015). For Mexico, the population connected to the Internet is in 44% of the population and is centralized in the cities with the highest population, however due to the use of mobile technologies this is changing for remote communities, as the use of mobile technology has increased the number of connections, promoting the interactivity of these remote communities with a landscape of cultural and multilingual diversity from in the world. (Notimex, 2015)

Mexico is perhaps the most diverse country in the Americas (Schmelkes, 2013), The National Census of Population and Housing 2011 tells us that 6.9 million Mexicans speak a native language, and 15.4 million are considered indigenous, which corresponds to 14.87% of the population (INEGI 2011), the National Institute of Indigenous Languages reported the existence of 68 ethnic groups. (INALI, 2005) mainly in the states of Chiapas, Chihuahua, Guerrero, Hidalgo, Oaxaca, Puebla, San Luis Potosi, Veracruz and Yucatan, being those with the greatest diversity of indigenous groups, with 25% of the existing indigenous origin municipalities in the country. (Official Journal of the Federation SEGOB, 2014).

The Huasteca, Teenek bichou or Tének territory, according to Joaquin Meade, was much more extensive than today, from the eastern coastal area of Mexico, River Soto la Marina at north, from the Sierra Madre Oriental to the Gulf of Mexico and the south with the Cazonas river covering the current states of Tamaulipas, San Luis Potosi, Veracruz, Queretaro, Hidalgo and Puebla (Meade, 1977).

The Huastecos or Tének, according to Ruvalcaba, "Te 'Inik" ("TE'", here and "Inik" Men) "men from here" (Ruvalcaba Mercado, 1995) have a language that belongs to the Mayan language family (Ramirez, 2003). According to INEGI to 2010 the Tének language counts with 161,120 million speakers, men and women older than 5 years in the state of San Luis Potosi, from a total of 256,468 speakers of an indigenous language, being the Tének the second most used with 99,464 speakers.

Reaching almost 40% of the speakers of an indigenous language in the state (INEGI, 2010) population.

The population is centralized in the municipalities belonging to the Huasteca area such as: Ébano, Tamuín, Cd. Valles, Aquismón, Tanlajás, Tanquián, San Vicente, Tampamolón, San Antonio and Tancanhuitz, where the state government has employed strategies for the preservation of the language and culture, such as the establishment of bilingual and intercultural schools in these municipalities, on the other hand has encouraged the use of the same, with the implementation of ads, brochures, and government officials who use Tének language to communicate with the community. Another important program, was the one implemented in the period 2009 - 2015, where XO computers customized in Tének language, were delivered to 50 primary schools in the municipalities of San Antonio, Tampamolón, Tanlajás and Ciudad Valles (Torres, 2014).

Nevertheless technology without the support of teaching resources can prove to be obsolete, the real importance lies not in the use of these technologies, means or tools in the classroom, but in the formative intention and teaching management that they are given (Hernandez & Muñoz, 2012).

There are applications developed for the use of Tének language, such as geographic location of users of social networks Nenek and Yauí (Hernandez Gonzalez Jimenez, & Camposano, 2014) and shown in Methodology for development a storage system for virtual communities (Jimenez Hernandez Gonzalez, & Vega, 2015), yet they are not focused on learning of it

Which motivates the development of applications that support the teaching of indigenous languages, implemented on technologies that are already available to some Bilingual and Intercultural schools in the

Huasteca region, which could allow a better didactic intention in the classroom (Collective Childhood Education and ICT, 2014).

### Methodology

Development of Nik'adh duche': Web application for the learning of the Tének alphabet:

### Review and documentary research

The documentary investigation began reviewing several books for teaching Tének language, books used by the Ministry of Public Education (SEP) for Bilingual and Intercultural schools "T'ilab ti Tének" = Book of literature in language Tének San Luis Potosi, "In librojil an pulik exóbal" = Book for adult learning in Tének language, where two types of vocabulary were identified, one proposed by Ramon Larsen (Larsen, 1955) and the other, proposed by a group of ethnolinguists who edit "Gramática Huasteca" (Esteban Fernandez, & Mendez, 1986).

The first alphabet proposal consisted of 33 symbols to write the language while the second proposal uses 28 symbols, however by doing a search for documents written by native speakers whose mother tongue is Tének, it was shown that the latter is the most used because it is in the textbooks provided by the SEP.

**Design of the educational planning and script activities**

To carry out the plan of educational work and scripting of activities for the implementation of Nik'adh duche', the needs of users were considered, especially knowing the alphabet, different teaching activities were designed to learn each of the letters in the alphabet through simple and dynamic activities.

At the moment each of the sections of the application were designed, a script is integrated in these activities, in order to provide a better control and monitoring.

To improve educational planning a series of fielworks were carried out with the ethnolinguist Ma. Clementina Esteban Martinez, who verified the writing, so that it was valid, legible and flexible for the user, according to the proposed activities.

**Architectural design and development of the web application**

Once the planning and didactic instrumentation has been reviewed and endorsed, the development of Nik'adh Duche' starts, see Figure 1.

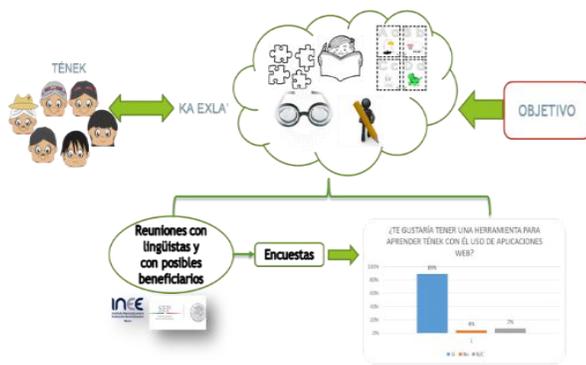


Figure 1 Nik'adh Duche' Module

Under the software development methodology called IWeb proposed by Pressman (Pressman, 2005), different technologies such as style sheets (CSS), PHP, database (PostgreSQL), JavaScript files, among others shown in Figure 2 are implemented.



Figure 2 Technologies

The proposed implementation is based on the following: a user who generates a login and access the application, this user is presented with a work area where the activities designed for learning the alphabet are shown, once displayed, the user can perform and achieve basic learning by visual and additive interaction, which until this time have referred, Figure 3.

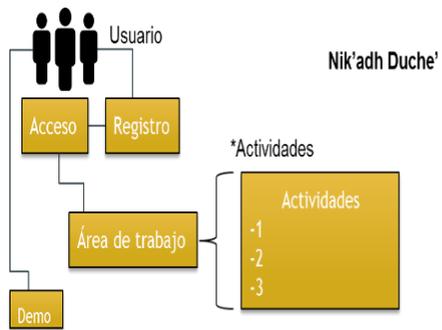
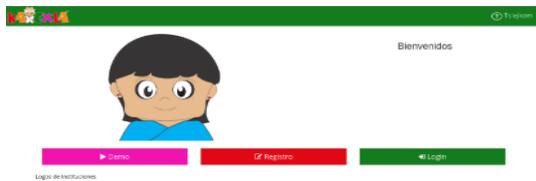


Figure 3 Nik'adh Duche' Modu

**Results**

A prototype application called Nick'adh Duche' was developed, aimed for the users of the application to learn the Tének alphabet as well as vocabulary presented in the different activities.

This application arises from several meetings, field work, and surveys, leading to the approval of the project. In the application, the users can learn in a dynamic and fun way, as the learning if the language is based on readings, writings and visualizations. The applications focus on being dynamic and interactive, with the purpose of being easy to use and attractive to the users, creating a support for the preservation and dissemination of the Tének language.



**Figure 4** Main view of the application



**Figure 5** Tének Alphabet

Figure 5 presents the Tének alphabet, matching what is used by the SEP in the programs of the Directorate of Intercultural Indigenous Education from the state of San Luis Potosi

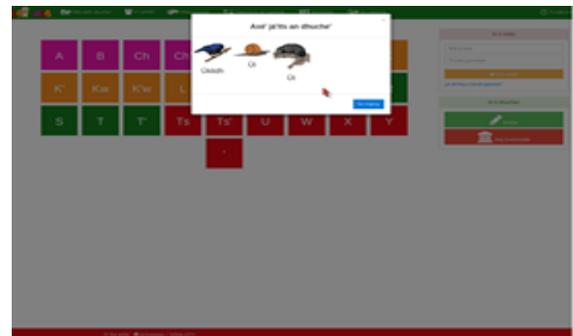


**Figure 6** Available actions in the alphabet for the letter



**Figure7** Available actions in the alphabet for the letter T'

Figures 6, 7 and 8 show the results of selecting a letter of the alphabet, opening a section of images labeled with its translation in Tének and the playback of an audio related to the image, this allows the cognitive association of the words in three dimensions: visual, writing and listening.



**Figure 8** Available actions in the alphabet for the lett

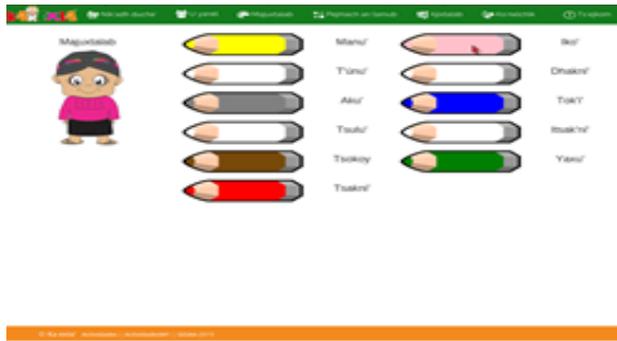


Figure 9 Colors section

The Figure 9 presents the colors, this section has an interactive feature, as each color appears inside the pen when it is selected while also playing the audio of the word.



Figure 10 Weather seasons section

Figures 10 and 11 show the seasons in image and word in Tének.



Figure 11 Weather seasons section

The figure 12 shows the activity of a memory game, through which the user can learn by playing, because it is a suitable technique for the improvement and understanding of the meanings, which in this case are the numbers.



Figure 12 Numbers section (memory game)



Figure 13 Animals section

Finally, figure 13 shows the section on animal names, with imagery and audio, classified as pets and wild animals..

### Conclusions

Through the use of Nik'adh Duche', it will be possible to analyze the usefulness of the tool to start learning the basics of writing and reading in Tének, which would allow to the generation of diverse and varied instruments to strengthen the application so that it can be proposed to be used as a pilot program in some bilingual schools in the Huasteca.

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