

Interactive Book of the History of Tlaxcala

Libro Interactivo de la Historia de Tlaxcala

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Abstract

This article presents an Interactive Book of Tlaxcala History, the project is based on the importance of culture focus on the general public, starting from a feasibility study and a survey of knowledge about Tlaxcala history. The interactive book shows the History of Tlaxcala of a digital and dynamic way. This project is based on the book —Tlaxcala in the sixteenth century of Gibson (1991). The book contains 3D scenarios of the architectural structures of three manors of ancient Tlaxcala: Ocotelulco, Tepeticpac and Tizatlán, furthermore the ex-convent of San Francisco, which is a religious building of the colonial time. The virtual scenarios are presented as videos and they allow for the reader to visualize the constructions done at that time. The book contains representative images and text. In addition, the project incorporates memory games and quizzes. Finally, the book use the page flip effect (turn the page) which is an excellent resource for a dynamic reading

Digital book, Interactive book, 3D scenarios, Gistory of Tlaxcala

Resumen

En este artículo se presenta un Libro Interactivo de la Historia de Tlaxcala, tomando como base la importancia de la cultura hacia el público en general, partiendo desde un estudio de factibilidad y de una encuesta de conocimientos de la historia de Tlaxcala. El libro digital, está basado en el Libro —Tlaxcala en el siglo XVII de Gibson [1], y tiene como objetivo dar a conocer la historia de una manera digital y dinámica. Se describen escenarios virtuales modelados en 3D de las estructuras arquitectónicas reconstruidas de tres de los señoríos principales de la antigua Tlaxcallan: Ocotelulco, Tizatlán y Tepeticpac, además del exconvento de San Francisco, edificio religioso de la época colonial. Los escenarios se exponen a través de videos que muestran un recorrido virtual, permitiendo al lector visualizar como se encontraba su estructura en aquella epoca. A lo largo del libro se tienen imágenes representativas de los textos y se cuenta con interactividad al incorporar juegos de memoria y quiz. Finalmente se utilizo el efecto page flip (pasar página) que es un excelente recurso para la dinamización de la lectura.

Libro digital, Libro interactivo, Escenarios 3D, historia de Tlaxcala

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## Introduction

Technology has evolved surprisingly, day by day there are new advances that little by little are covering all areas, one of them is undoubtedly education, currently, there are computational tools that come to benefit both traditional education in a classroom, like distance education. A support tool that promotes the diversification of learning channels is undoubtedly an interactive digital book, because it contains textual information, but also additional material to complement the reading, such as the inclusion of images, audio, videos, animations, three-dimensional models. and various activities that result in immediate feedback.

Among the digital books is the Interactive Atlas of Spanish Intonation [2], which contains maps, audio and video for the study of prosody in different dialects. Another example that should be mentioned is the Interactive Laparoscopic Surgery book [3], which handles chapters and multimedia manuals for medical students. A third interesting example is the Atlas of Human Anatomy [4], which contains different animations of the organs of the human body. Finally we mention the interactive book Don Quixote de la Mancha [5], which contains animations, images, videos and music. Specifically, this article describes an interactive digital book focused on the theme Tlaxcala in the 16th century, this book contains cultural information, 3D architectural structures of Ocotelulco, Tizatlán, Tepeticpac, and religious buildings from the colonial era of Tlaxcala

## Technology in Education

Technology has evolved in such a way that today all computers are capable of handling graphics, virtual worlds, audio, etc., aspects that can be used in education. However, currently, the incorporation of different digital tools in education is still complicated, although it is important to recognize that little by little it has been gaining momentum.

A tool that is already being used is the digital book, which features real information of a conventional type with digital images and audio, and little by little animations and models have been integrated in three dimensions. These books are easy to use for both the student and the teacher.

However, there are other equally interactive tools that were initially little accepted, such as video games, which were linked to criticism that disadvantaged them and prevented their use in the classroom. These limits are currently being exceeded and different educational tools are already being developed.

## Feasibility study

For the development of this project, an Operational and Technical Feasibility study was carried out. The Operational Feasibility was done through surveys of the general public, which were applied in 4 areas of the state.

From the south central zone, Tlaxcala was selected for being the fundamental part of history as well as housing the most important buildings in the state, and for being considered the cradle of the nation.

From the north-central area, the Municipality of Tetla de la Solidaridad was selected, because it is the pioneer municipality for the American continent of the Brava festival, in this area is the farm and cattle ranch of —San Mateo Piedras Negras, the mother of the cattle ranch. American continent

From the western area of Tlaxcala, the Municipality of Xaltocan was selected for being famous for the elaboration of quarry stone crafts, crafts that are found from the national palace to some of the streets of the Tlaxcala capital.

From the downtown area, the Apizaco municipality was selected for being the largest city in the state, as well as one of the most recently founded, being the most important commercial corridor in the state.

The survey was made up of 8 questions addressed to the general public in order to identify the feasibility of the implementation of the Interactive Book of Tlaxcala in the 20th century.

XVI. To carry out the survey there was a sample of 50 people.

1. Did you know that Tlaxcala is called the cradle of the nation?
2. Do you know the 4 lordships of the state?

3. Do you know where the name of Tlaxcala came from?
4. With what name was the city of Tlaxcala founded?
5. What was the territorial order by which Tlaxcala was conquered?
6. Do you know how to use a computer? 7.- Do you have a computer?
7. Is it more practical to learn from videos, using a computer?

The responses of the respondents were classified into 2 areas that in our consideration are a core part of identifying the level of feasibility of the implementation of this project, the History of Tlaxcala and the Technology.

The results of the Tlaxcala history category are shown in Figure 1, it can be seen that the knowledge of their own culture of Tlaxcala in general is very low, which was evaluated from 1 to 10.

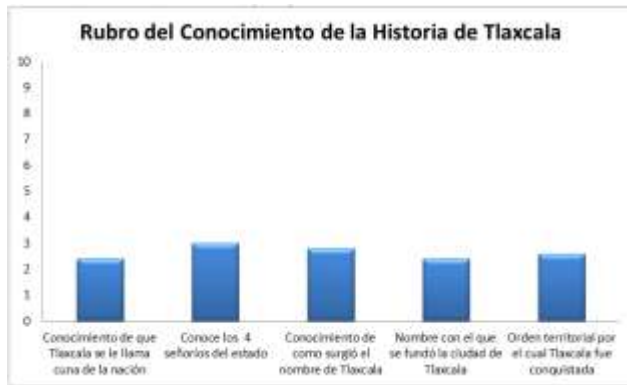


Figure 1 Results of knowledge of the history of Tlaxcala

The results of the Technology area are shown in Figure 2, it can be interpreted that in general the Tlaxcalans know how to use a computer, they see it feasible to use it to learn and 80% of them have a computer at home.

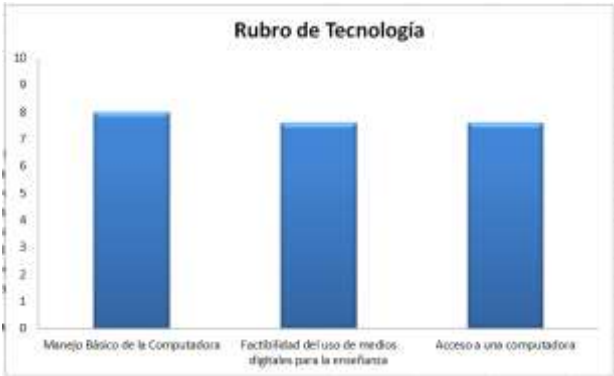


Figure 2 Results of the Technology Sector

The results of this survey are interpreted as favorable, because it is important to do something for our culture. The survey that was applied has allowed to determine that people have little knowledge of the history of Tlaxcala, but if they have basic computer knowledge, in addition to that there is a high percentage of the population with at least one computer at home or at work . All these data obtained have served us to affirm that the implementation of the —Libro Interactivo de Tlaxcala in the 16th century siglo project is feasible.

During the Technical Feasibility study, the minimum necessary computational requirements for the proper functioning of the —Interactive Book of Tlaxcala in the 16th century were determined, which are Pentium processor or higher, 1 GB RAM, video card and speakers, this due to that it is a graphical environment. As basic software requirements, Windows operating system, Macromedia Flash Player and any Internet browser are required.

Interactive book on Tlaxcala in the 16th century

The interactive book on Tlaxcala in the 16th century includes textual information, images, different virtual scenarios, Puzzles, Quiz and the page flip effect (an effect with which when changing pages it is shown as if it were turning the page in a real book or magazine ), see Figure 3. For the development of the book, tools such as sketchup were used for 3D modeling, neobook 5.0 for generating the executable file and JClick for developing activities and games.



Figure 3 Interactive book

The Book is organized into three main options:

Read book, option that commands the interactive book of Tlaxcala in the 16th century.

Complementary games and activities, option that leads to the activities and games,

Quiz, option that sends to the page with the quizzes organized by chapters.

During the text, four main settings are shown, the Señoríos de Ocotelulco, Tizatlán and Tepeticpac and the former Franciscan convent of the city of Tlaxcala

Señorío de Ocotelulco. For the modeling, photographs taken from the archaeological zone of San Francisco Ocotelulco and the model that represents the main temple were used, see Figure 4. The original materials and textures were used, obtaining the main temple of the Ocotelulco manor shown in Figure 5.



Figure 4 Model of the main temple of Ocotelulco



Figure 5 Main temple of the Ocotelulco manor

Señorío de Tizatlán For the construction of the 3D model of the archaeological zone of this manor, the plan of the tecpan or main temple was used, see Figure 6, photographs of the site were taken for the textures of the walls, floors and initiation stones as shown in Figure 7.

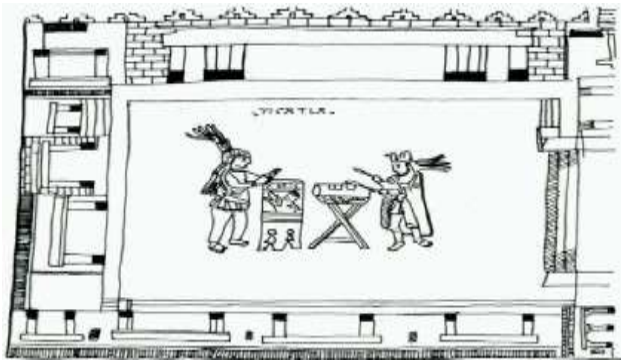


Figure 6 Plan of the Principal Tecpan or palace of Xicoténcatl

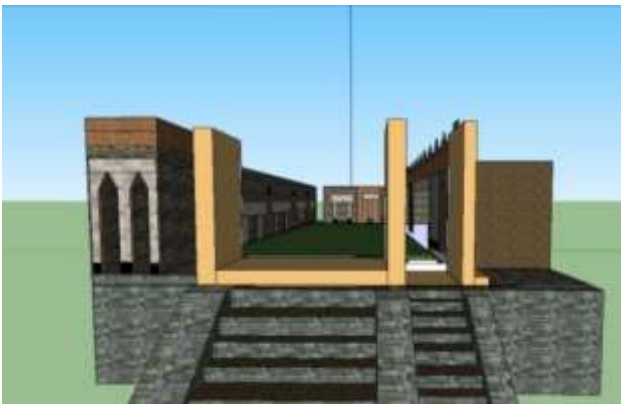


Figure 7 Tecpan de Tizatlán model

Señorío de Tepeticpac. For the Tepeticpac manor, we worked with photographs taken of the architectural remains of the barracks of the archaeological zone that the INAH had explored until November 2012, see Figure 8. The modeling shown in Figure 10 was achieved by taking the textures of the temple.





**Figure 8** Barracks of the lordship of Tepeticpac

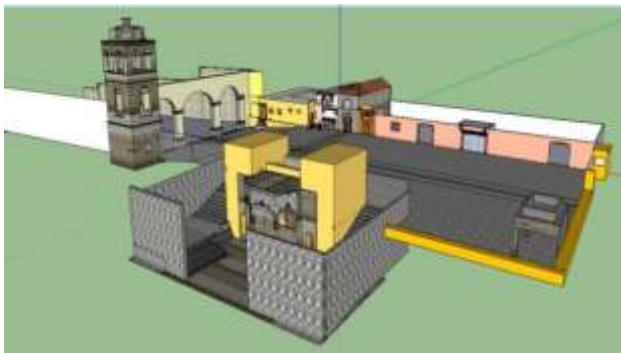


**Figure 9** Model of the lordship of Tepeticpac

Former Franciscan convent in the city of Tlaxcala. The temple is located in the upper part of the Xicotencatl square in the city of Tlaxcala. The design of the following areas can be highlighted:

- The Cathedral of Our Lady of the Assumption
- The tower and bell tower
- The regional museum of Tlaxcala
- The open chapel
- The arches of the entrance
- The old jail
- The parking lot of the former convent
- The atrial wall
- Religious articles businesses
- The stairs leading to the open chapel

For its development, photographs of the real textures were obtained, which served to give the 3D model the necessary details that enhance the stage, as can be seen in Figure 10.



**Figure 10** 3D model of the former Franciscan convent of Tlaxcala

Puzzles were incorporated into the project because this is an entertaining game for children and adults, which sharpens observation, attention and concentration, in addition to improving mental agility, by exercising the use of logic, ingenuity and the use of strategies to relate the different pieces, either by their shapes or colors, see Figure 11.



**Figure 11** Final puzzle

The inclusion of the Quiz was due to the importance of the reader receiving feedback as his reading progresses and knowing his performance obtained.

### Tests and Results

At the end of the project, usability tests were carried out on 50 users. The evaluators were asked to use the Interactive Book of Tlaxcala in the 16th Century. After exploring the book, the project was evaluated.

The results obtained are shown in Figure 11. It can be interpreted that there were minimal difficulties for the installation of the book, since the evaluators belong to the general public. The usability level was 8, which is interpreted as a good usability level. Some activities such as the included games were evaluated with a grade of 10. The overall project was evaluated with a grade of 9, and there were many positive comments, around the development of the book.

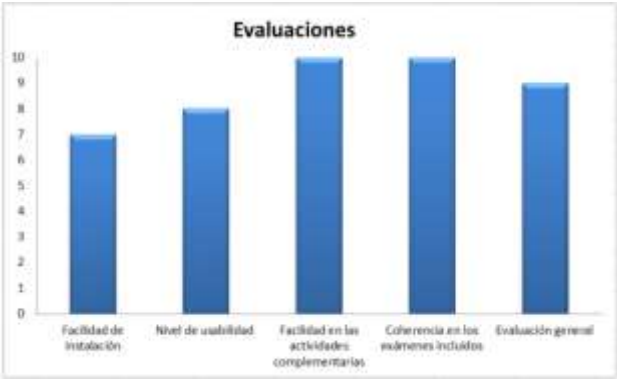


Figure 12 Results of the evaluation of the Interactive Book

Conclusions

Currently, technology is giving rise to changes in all areas, for example, readers are changing their preferences in the acquisition of books, having computers and mobile devices acquire digital books seeing the advantage of being able to take them with them anywhere.

The Tlaxcala Interactive Book project in the 16th century, will contribute to publicize the history of Tlaxcala, making use of technological means for its development, in it virtual tours of the manors of Ocotelulco, Tizatlan, and Tepetícpac, and the Ex Franciscan convent of the city of Tlaxcala, in addition to interactive activities that gave potentiality to the work.

Finally, the Academic Body of Distributed and Intelligent Systems of the Autonomous University of Tlaxcala consider that the incorporation of Interactive Books at any level is a fundamental part of the intellectual development of Mexicans.

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