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Presentation of the content

In the first article we present, *Equity in technological higher education. A look from the Subsystem of Technological Universities in Mexico*, by MÉNDEZ, Sandra P., AGUILAR, Laura, GARCÍA, Martha G. and GARCÍA, José P., with adscription in the Universidad Tecnológica de Tula-Tepeji, in the netx article we present, *Data Privacy*, by CASTAÑEDA-TOTOZINTLE, Edgar Eduardo, with adscription in the Universidad Iberoamericana, in the netx article we present, *Interactive Book of the History of Tlaxcala*, by MORA-LUMBRERAS, Marva, SANCHEZ-SANCHEZ, Norma, CUAHUTLE-COVARRUBIAS, Carmín and TORRES-HERNANDEZ, José, in the last article we present, *Growth of the Toluca Valley and its effect on the disappearance of indigenous languages from 1990 to 2010: A historical-linguistic approach*, by NAVA-GUADALUPE, Reynoso Jenaro, with adscription in the Universidad Autónoma del Estado de México.

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Equity in technological higher education. A look from the Subsystem of Technological Universities in Mexico

Equidad en la educación superior tecnológica. Una mirada desde el Subsistema De Universidades Tecnológicas en México

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Abstract

This work is part of the results of an investigation that is being carried out at the Technological University of Tula-Tepeji with the objective of analyzing the public policy of creation of the Technological Universities Subsystem (SUT) that the Mexican federal government implemented in response to educational equity. The work corresponds to an investigation with an exploratory and analytical approach that began with the study of theories related to equity in education and the educational policies implemented by the federal government in terms of equity to land with a quantitative study of the SUT. An attempt is made to answer the question: In what way has the SUT contributed to reducing situations of educational inequity in groups of young students from the less favored social strata? to assess scope, for now, only with respect to educational inclusion. However, educational equity is a more comprehensive concept that encompasses other dimensions of analysis and not only effective access to higher education, which is why it is proposed in the end to carry out other complementary studies to make a more objective balance. of the results achieved by the SUT.

Equity, Inclusion, Higher Education, Educational Policies, Subsystem of Technological Universities

Resumen

El presente trabajo forma parte de los resultados de una investigación que se está realizando en la Universidad Tecnológica de Tula-Tepeji con el objetivo de analizar la política pública de creación del Subsistema de Universidades Tecnológicas (SUT) que implementó el gobierno federal mexicano en atención a la equidad educativa. El trabajo corresponde a una investigación con enfoque exploratorio y analítico que inició con el estudio de las teorías relacionadas a la equidad en la educación y las políticas educativas implementadas por el gobierno federal en materia de equidad para aterrizar con un estudio cuantitativo del SUT. Se intenta dar respuesta a la pregunta ¿De qué manera el SUT ha contribuido a reducir situaciones de inequidad educativa en los grupos de jóvenes estudiantes de los estratos sociales menos favorecidos? para valorar alcances, de momento, sólo con respecto de la inclusión educativa. Sin embargo, la equidad educativa es un concepto más integral que abarca otras dimensiones de análisis y no sólo el acceso efectivo a la educación superior, por lo que se propone al final la realización de otros estudios complementarios a este que permitan realizar un balance más objetivo de los resultados alcanzados por el SUT.

Equidad, Inclusión, Educación superior, Políticas educativas, Subsistema de Universidades Tecnológicas

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† Researcher contributing first author.

Introduction

This study is part of the issue of educational inequalities, specifically in higher technological education in Mexico. Although both concepts, poverty and inequalities are related, this does not mean that they express the same thing. Braing, Costa and Gobel (2015) cited by Villa Lever (2017, p.8) refer that although there may be a direct relationship between the terms, poverty "is related to the distribution of people's economic income" and inequality It shows the gap that exists between "the possibilities of access to goods and resources of the different social positions that make up a society, to access both socially relevant goods and resources" such as education.

Around the concept of social inequalities is that of equity in education. Various researchers have approached the subject and there are relevant studies that serve as a background; The works of Coleman (1966), Boudon (1983), Latapí (1993), Bartolucci, (1994), Sen, (1995), Roemer, (1998 and 1999), Reimers, (2000), Rojas, (2004) stand out. ; Bolívar, (2005), Lemaitre, (2005), among others.

From the previous works it is deduced the role that institutions play and the correct definition of educational policies to serve young students from vulnerable sectors, whether due to their socioeconomic condition, gender, ethnic identity, physical or cultural traits, age, condition of health or place of origin do not obtain the expected benefits of education.

There are students with different characteristics and needs who, due to these differences, have been marginalized and excluded from education; Therefore, one cannot speak of equity if there is no integration of what we know as vulnerable groups or "socially perceived subjects as the symbolic incarnations of marginalization" (Didou, 2011, p.6) for which and from a perspective of distributive justice, inclusion mechanisms must be designed and implemented that create conditions for them to have opportunities to enter the educational system. However, educational equity does not refer only to the opportunity to access higher education. Although both concepts, equity and educational inclusion are related, it is necessary to overcome the legal concept of equity understood as equal opportunities in which all individuals are equal by law.

Equity cannot be reduced only to the distribution of educational opportunities; that is to say, to equal opportunities of access to education; To achieve equity in higher education it is necessary to guarantee access and permanence in the school system and also ensure an equitable distribution of the benefits derived from the schooling obtained (Muñoz, 2009).

It is necessary to advance in the analysis on the conception and application of the term to understand that currently the concept of equity refers precisely to the differences between individuals, that is, to human diversity that introduces elements of social justice typical of the field of philosophy (Rawls, 1979 cited by Bolívar, 2005) and avoid, from that conception, not only school failure and dropout, but also job failure and little or no social mobility.

The concept of equity in higher education is so broad that the scope of this work deals only with the analysis of educational inclusion, which is understood as the provision of educational services to all people who have significant differences. It refers to the vulnerable population that, "due to some specific characteristic," is in an unfavorable condition compared to another sector of society "(Mercado, Amador & Cabana, 2014, p.10).

In relation to the above, the design and implementation of educational policies requires special care, especially if the nature of education is recognized as a public good, where the public means that the government must create the conditions for education to be accessible to all. all, especially for the most vulnerable groups in society. Aguilar (2003) cited by Flores (2008, p.16) mentions that "if government policies do not have the purpose of closing the gaps of inequality and social marginalization, it is difficult to grant them the quality of public".

In the case of Mexico, the international situation of the 90's determined by a process of massification of education, globalization, important socio-demographic, technological and economic changes, characterized by various problems arising from its own internal dynamics, especially social inequality , meant the turning point for a series of significant transformations in education. (Mendez, 2020)

The main concern of the Mexican government at that time was to implement policies that increased coverage rates at different educational levels. In higher education, a series of policies were defined to promote equity. However, various researchers (Vargas Leyva, 2003; Flores Crespo, 2005; Silva Laya, 2006; Ruiz Larraguivel, 2001, 2009 and 2011; Villa Lever, 2002 and 2013) called all of these actions only as "Public policy of expansion , diversification and differentiation of Higher Education ".

One of the main strategies derived from the previous policy was to open new institutions to meet the demand for education, mainly that of young people who, due to their economic and social condition, could not access higher education. This is how the Technological Universities Subsystem (SUT) emerged in 1991 with the creation of 3 Technological Universities in the country: the Technological University of Nezahualcóyotl, the Technological University of Aguascalientes and the Technological University of Tula-Tepeji.

From the context of the educational policies dictated by the federal government, the new university subsystem visibly impacted higher education and was the object of study by various researchers such as Didou (1996), Villa Lever (1997, 2002, 2003 and 2004) , De Garay (2006), Flores Crespo (2002, 2005 and 2009) Silva Laya (2005, 2006, 2008 and 2012), López (2008), Muñoz left (2006) and Ruiz Larragivel (1993, 1996, 2004, 2007, 2009 and 2011) among others.

However, at present there are few investigations related to Technological Universities (UT), especially since 2009, the year in which the SUT began a series of important changes and transformations to expand the scope of professional studies from Higher University Technician to undergraduate level, leaving open the possibility of continuing postgraduate studies, even within the subsystem itself. More than 25 years after its creation, the UTs have grown considerably, however, this research is circumscribed in the equity debate and is relevant because it focuses on the internal processes of the SUT itself and tries to respond to the He asks, in what way has the SUT contributed to reducing situations of educational inequality in groups of young students from the less favored social strata?

The objective is to analyze one of the public policies that the Mexican federal government has implemented to achieve equity in higher education, the creation of the Technological Universities Subsystem, in order to assess its scope and social relevance based on the results obtained.

I. **Method**

It is a quantitative and descriptive research that seeks to contribute to other studies on Technological Universities (Silva 2006; Flores Crespo 2002 and 2005; Silva and Rodríguez 2012 and Villa Lever 2008, among others) that in general have been carried out from the particular analysis of one of the subsystems of higher education in Mexico.

The study collects and analyzes information from the SUT related to the achievement of equity in higher education; It starts from a comprehensive conceptualization of equity that considers all moments of the educational process, although this work only addresses the issue of educational access as the first dimension around a new conceptualization of educational equity. (Silva laya, 2014)

2. Results

2.1 Promotion of equity in higher education in Mexico

One of the basic values that the Mexican government has promoted within public policies in education, mainly at the end of the 20th century and the beginning of the 21st century, is that of social justice, which is translated as a set of measures of educational equality and equity implemented by governments to meet the growing demand of the population for inclusive and quality education.

Derived from the study of sectoral education plans during the 1988-1994 six-year term, which is when the SUT emerged, until President Peña Nieto's six-year term, the main actions proposed by the federal government to promote equity are summarized below. in higher education in Mexico:

a)   Decentralize and regionalize education.
b)   Diversify higher education and career options to reorient higher education enrollment towards technology areas

c)   Implement new educational models according to the needs of the population and especially with the productive sector.
d)   Promote the opening of the greatest possible number of educational opportunities through the creation and operation of new public institutions in co-responsibility with the federal government of the states.
e)   Promote education in regions with a high density of indigenous population
f)   Give priority to the states and regions with the lowest coverage rates in order to seek a more equitable distribution of educational opportunities.
g)   Expand the educational offer through Scholarships for Higher Education
h)   Privilege attention to groups and areas with the greatest economic and social disadvantage.
i)   Make more efficient use of installed capacity.
j)   Expand the non-school educational offer

It is noteworthy that behind each of the above strategies prevails the search to expand coverage, increase enrollment, improve the quality of services and achieve the much-desired equity in higher education.

2.2 Balance on the results obtained by the Technological Universities Subsystem in terms of equity

Within the framework of the educational modernization policies proposed by President Carlos Salinas de Gortari, the Subsystem of Technological Universities (SUT) emerged in Mexico whose main purpose was to provide the industrial sector with technicians at the level of middle management; above operators and supervisors; but below the managers and administrators (CGUT-SEP, 2000) and that given the recommendations of certain international organizations such as the OECD and the trends derived from the World Conference on Higher Education (1998), could represent an opportunity for Mexico. As a result of the aforementioned educational policies, the start of the Technological Universities project as a new educational modality that offered short higher careers to meet the educational demand in regions far from the main universities of the country and the management of this type of institutions on all for the attention of the less favored social groups with education.

Undoubtedly, the birth of the first three UTs in 1991 meant the modification of the structure of the higher education system and with it the consolidation of an educational level previously non-existent in the country, that of Higher University Technician. In fact, UTs became the first universities to offer short higher education through ISCED level 5B vocational training programs.

One of the most important aspects that were also glimpsed from the origins of the UT was that with this educational modality it was sought to include young people from the "social sectors with fewer economic resources" and less favorable to the completion of higher studies than the generality of enrollment in HEIs; Therefore, it was considered that several students found in the UT the opportunity to carry out higher studies after failing to enter a four or five-year IES (De Garay, 2006, p.164).

But in what way has the SUT contributed to reducing situations of educational inequity in groups of young students from the less favored social strata ?; Although there are different dimensions of equity that serve to analyze the results and that according to Silva Laya (2012, p.12-13) can be summarized in four moments such as "effective access" to education, "compensation of inequalities "," permanence in studies "and the conclusion or search for" significant results "derived from the training, some indicators that account for the achievements of the SUT in regard to educational inclusion are described below.

2.2.1 Access to education in the SUT:

The growth and evolution of enrollment is one of the main indicators that have been considered to assess the results of educational policies to promote equity. In this sense, from the beginning the Technological Universities presented certain difficulties to position themselves as a significant option among students who graduated from the upper secondary level.

For Flores Crespo (2005) it was the unsatisfied desire to update their specialization at the undergraduate level and for De Garay (2006) the high expectations of being employed in productive activities related to their career that were not covered in reality.

Therefore, it is important to mention that in terms of growth and expansion, the SUT was initially unattractive and a considerable gap prevailed between the enrollment aspirations by the authorities and the installed capacity that was not fully used in the first years. of its creation. (Silva, 2006)

However, little by little this type of institution presented significant progress regarding the growth of enrollment and the percentage of coverage in higher education; The cause of the development of the SUT was mainly due to the educational policies of expansion, diversification and deconcentration implemented by the different Mexican governments after its creation, where the growth of new institutions and different educational options was privileged to include "those groups from the population that historically had greater difficulties in accessing higher education "(PNE, 2000, pp. 199).

Currently, the SUT has had considerable growth, thus achieving the commitment to expand coverage through the creation of technological education options, since while in 1991 only three UTs started, for the 2010-2011 school year there were 104 as can be counted. appreciate in the following graph:
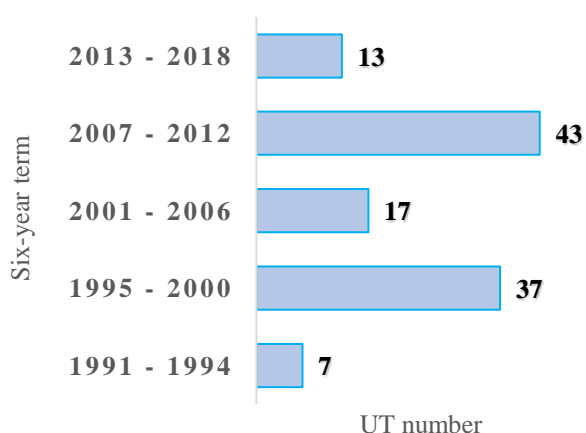
Graphic 1 Growth of the number of TUs by six-year term
Source: Own elaboration based on CGUTyP (2018).

Thus, the project that had begun in the Salinas de Gortari six-year term was consolidated in the following period with Mr. Ernesto Zedillo and during the six-year term of Mr. Felipe Calderón Hinojosa, a period in which a greater number of UTs were opened to give access to education for thousands of young students. Although, the social and business recognition of the new model took years to position itself.

The opening of the undergraduate level programs offered by the subsystem to expand the scope of professional studies to UT students as of September 2009, represented the beginning of a series of important changes and transformations that resulted in the strengthening and consolidation of the SUT.

At present, the Technological Universities are distributed throughout the country (see illustration 1) and the SUT has a presence in the 31 States of the Mexican Republic, except in Mexico City; that is, there is at least one TU per State.

Figure 1 Presence of UT in the Mexican Republic
Source: Own elaboration based on CGUTyP (2018)

Regarding the educational offer, the SUT also grew as a consequence of the reform implemented for the continuity of studies at the undergraduate level. (See graph 2)

At present, the UTs not only offer two-year programs that lead to obtaining the title of Higher University Technician (TSU); Instead, students have the possibility of completing a Technical Engineering or Professional License at the end of nine semesters and at the end of the eleventh semester obtain the Bachelor's degree as can be seen in Figure 2, leaving open the possibility of offering postgraduate studies as is the case of the Technological University of Tula-Tepeji.
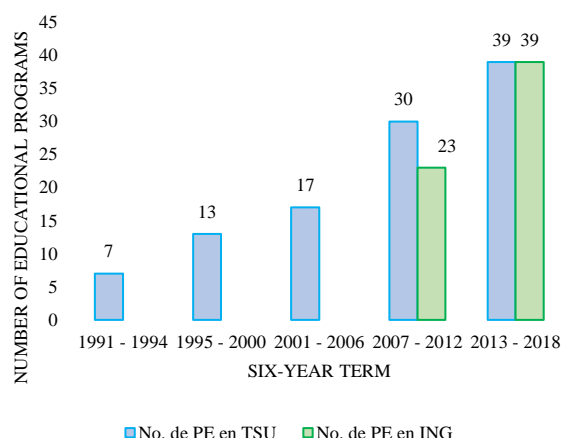
Graphic 2 Growth of Educational Programs of TSU and Engineering by six-year term
Source: Own elaboration based on CGUTyP (2018)

This reform implemented by the UTs was closely aligned with the strategy proposed by the Mexican government to "strengthen programs, educational modalities and mechanisms aimed at facilitating access and providing care to different population groups," through which the design of flexible programs with lateral or intermediate professional opportunities, which would allow combining study and work and thus facilitate access for various population groups (SEP, 2007, p.35).
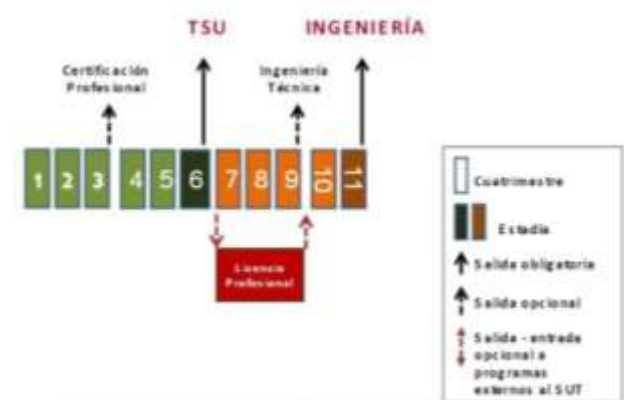
Figure 2 Curricular model of Technological Universities
Source: SEP-CGUT. (2008)

Enrollment is another indicator through which the results of an educational policy can be assessed, in this sense the result by the SUT through each six-year term can be seen in the following Graphic.
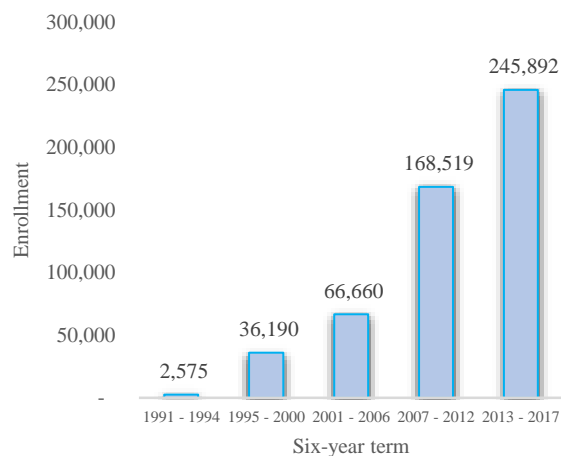
Graphic 3 SUT enrollment growth by six-year term
Source: Own elaboration based on CGUTyP (2018)

In addition to the enrollment indicator, Figure 4 also shows the behavior of the percentage participation percentage of the SUT in the Higher Education System, especially from the teaching of the Bachelor level.

At the end of 2006, the percentage participation percentage of the SUT was 3.3 percent (SEP, 2006), while as a result of the continuity of studies at the undergraduate level as of 2009, that percentage has remained close to 6 percent.

Finally, the growth of the SUT was a central part of the federal government's policies to promote a "fair" distribution of higher education mainly in marginalized areas, in that sense, educational programs are currently offered in regions where there was no higher education offer. (see graph 5).
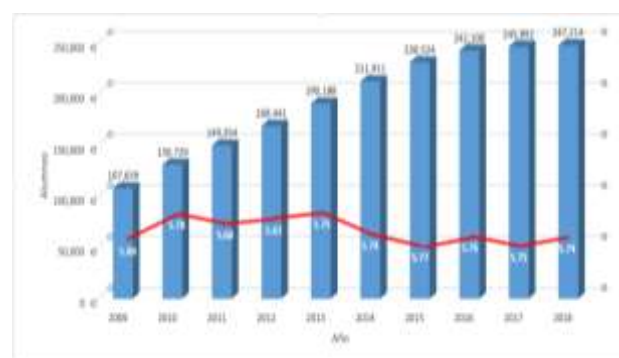
Graphic 4 Historical Enrollment 2009-2018 of the UT and Percentage Participation in the Mexican Higher Education System
Source: CGUTyP (2019)
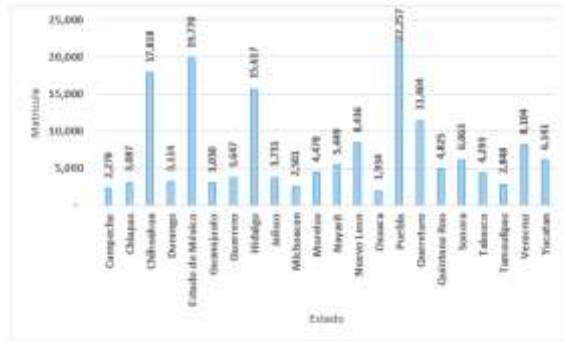
Graphic 5 SUT registration by State in marginalized areas
Source: Own elaboration based on CGUTyP (2018).

According to the SEP and based on the document Main figures of the Mexican Educational System 2016-2017, the SUT attended an enrollment of 240, 581 students, of which and according to the report of the CGUT itself (2018), the UT attended a enrollment in underserved areas 160,825 students.

Conclusions

The SUT is one of the main strategies used by the Mexican government to promote equity in higher education and it can be said that it represents an educational opportunity for thousands of young students who, due to their socioeconomic conditions, would not have the possibility of accessing education; that is, the design and implementation of public policy has produced significant results in relation to educational inclusion.

The UTs in general have been considered as "open door" institutions that privilege access to all young students; however, educational equity cannot be reduced only to the distribution of educational opportunities; It is necessary to promote educational research with more specific studies that account for other indicators that allow assessing other moments of the educational process.

Studies are needed in relation to the educational path followed by students entering the UT, and not only in educational access during their first year of university, which is in itself the most difficult (Silva Laya 2012); but in terms of the student's permanence in the SUT, in order to know the retention percentages and the true causes of desertion that prevent these young people from vulnerable sectors from continuing with their university studies.

More specific studies are also required on the monitoring of graduates, which account not only for the employment achieved, but more complete studies on the horizontal and vertical mobility of students. Currently the concept of equity has focused on the inequalities caused at the end of school careers; that is to say, at the end of the road and not only because students fail to graduate successfully; But because, derived from the degree they obtain, they are diverted to professional paths with less social value, so the analysis of this indicator is essential.

It is therefore a matter of analyzing other dimensions of equity "and not focusing only on access to education; but rather consider that, although they are different moments, together they make up a comprehensive policy on equity.

From the perspective of equity, it is concluded that it is necessary to guarantee a quality education and good educational results that permeate beyond the classroom; Therefore, it is necessary to analyze categories other than those of expansion, coverage and enrollment of the Subsystem of Technological Universities that allow to really assess the results of a policy on educational equity.

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Data Privacy

Privacidad de datos

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Abstract

The objective of this article is to analyze current situation and relevant historical events to Mexican Data Privacy Law and how it was influenced by another domestic dispositions around the world. Due to GDPR (General Data Protection Regulation) is about to enter into effect in EU (European Union), is it perfect moment to analyze the differences between the Mexican Law published 8 years ago and the most recent and sophisticated law in the world.

Resumen

El objetivo de este artículo es analizar la situación actual y hechos históricos relevantes a la Ley de Privacidad de Datos Mexicana y cómo fue influenciada por otras disposiciones domésticas alrededor del mundo. Debido a que el GDPR (Reglamento General de Protección de Datos) está a punto de entrar en vigencia en la UE (Unión Europea), es el momento perfecto para analizar las diferencias entre la Ley Mexicana publicada hace 8 años y la ley más reciente y sofisticada del mundo.

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Introduction

In order to correctly address the purpose of this article, it is essential to have a clear understanding of the concept of data privacy or personal information. In Mexico's law it was defined as "any information related to a person, that could make the person identifiable", for instance, name, address, social security number, salary, credit/debit card number, religion, sexual habits, clinical history, etc.

Since the publication of Universal Declaration of Human Rights in December of 1948, it was stated in the article 3 that "Everyone has the right to life, liberty and security of person", although this is a very general statement, it is clear that the protection to privacy is one of the elemental rights for all population around the world.

Data Privacy

Law in Mexico

There are at least 4 countries that published their data privacy laws before the Mexican one.

Country	Year of publication
USA	1974
Spain	1999
Argentina	2000
Uruguay	2008
Mexico	2010
Perú	2011
Colombia	2012
Nicaragua	2012

Table 1

In fact, it is known that first attempts of the approval of the law in Mexico were frustrated due to it was a literal copy of the Spain law. In 2010 the last initiative of the Data Privacy in Mexico was influenced by the Spanish one, which was very logical due to the experience of almost 2 decades since it was published. In the process a very experienced group experts were came from Spain to share the best and the worst of those 20 years.

After almost 8 years of having being published the balance and lessons learned in Mexico could sum up as follows:

At the beginning, there were big expectations about the difficulties to comply with the requirements, but most of decisions makers in enterprises though that it was just necessary the privacy statement publication.

Fines were imposed to big, medium and small enterprises, mainly in financial sector.

GDPR

The GDPR was designed to harmonize data privacy laws across Europe, to protect and empower all EU citizens data privacy. the GDPR was finally approved by the EU Parliament on 14 April 2016 and it will be mandatory on May 25th 2018. Organization had 24 months to be in compliance to avoid to be imposed fines.

GDPR replaces the Data Protection Directive 95/46/EC that was published and approved in October 1995. It is important to understand that GDPR must be applied in its entirety across the EU, while the Data Protection Directive set out a goal that all EU countries must achieve. However, it was up to the individual countries to decide how to apply it.

The GDPR not only applies to organizations located in the EU, this regulation also applies to organizations located outside of the EU if they offer goods, services or monitor the behavior of data of EU citizens. It applies to all companies processing and holding the personal data of people residing in the European Union, regardless of the company's location.

Organizations can be fined up to 4% of annual global turnover or €20 Million (the maximum fine) in case of being in non-compliance with GDPR. Some of the cases in which organizations will be fined are the following:

– Not having sufficient customer consent to process data

– Violating the core of privacy by design concepts

– Not having their records in order

– Not notifying the supervising authority and data subject about a breach

– Not conducting impact assessment

Both controllers and processors (a controller is the entity that determines the purposes, conditions and means of the processing of personal data, while the processor is an entity which processes personal data on behalf of the controller).

GDPR improvements

Although the key principles of data privacy are the same that the previous directive, many changes have been proposed to the regulatory policies. The most important changes are the following:

Increased Territorial Scope (extra-territorial applicability)

The biggest change with the regulatory is the extended jurisdiction of the GDPR, as it applies to all companies processing the personal data of people residing in the EU, regardless of the company's location. The GDPR will also apply to the processing of personal data of data subjects in the EU by a controller or processor not established in the EU, where the activities relate to:

–   Offering goods or services to EU citizens

–   The monitoring of behavior that takes place in the EU

Penalties

Organizations in breach of GDPR can be fined up to 4% of annual global turnover or €20 Million (whichever is greater).

Consent

The conditions for consent have been strengthened, and companies will no longer be able to use long illegible terms and conditions. The request for consent must be given in an intelligible and easily accessible form, with the purpose for data processing attached to that consent.

Breach Notification

Under the GDPR, breach notification will become mandatory in all member states where a data breach is likely to "result in a risk for the rights and freedoms of individuals". This must be done within 72 hours of first having become aware of the breach.

Right to Access

Part of the expanded rights of data subjects outlined by the GDPR is the right for data subjects to obtain from the data controller confirmation as to whether or not personal data concerning them is being processed, where and for what purpose.

Right to be Forgotten

Also known as Data Erasure, the right to be forgotten entitles the data subject to have the data controller erase his/her personal data, cease further dissemination of the data, and potentially have third parties halt processing of the data.

Data Portability

GDPR introduces the right for a data subject to receive the personal data concerning them, which they have previously provided in a 'commonly use and machine-readable format' and have the right to transmit that data to another controller.

Conclusion

Due to Mexican Congress create the Mexican Data Privacy Law with advisory of experts and their recommendations of 20 years (specially from Spain), it was a very strong regulation. The biggest challenges for Mexican regulation in the last 8 years, it has been the compliance and the government's ability to monitor all organizations.

It was obvious that Data Protection Directive from 1995 need an update after almost 25 years. This update came with GDPR and exactly as the Mexican one in 2010, took the best of other domestic dispositions.

When key changes and improvements of GDPR (according to Directive) are analyzed and compared with the Mexican law, it is clear that almost all of them were stated since 2010 in Mexico.

–   Territorial
–   Consent
–   Breach notification
–   Right to access
–   Right to be forgotten

This is a strong proof that Mexican Law was not a bad copy of the European Directive, in fact it was reference for other countries for their local dispositions.

Now the challenge for the Mexican regulation is to update new proposals of GDPR, for example Data Portability.

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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 XVI‖ 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 señorios 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.
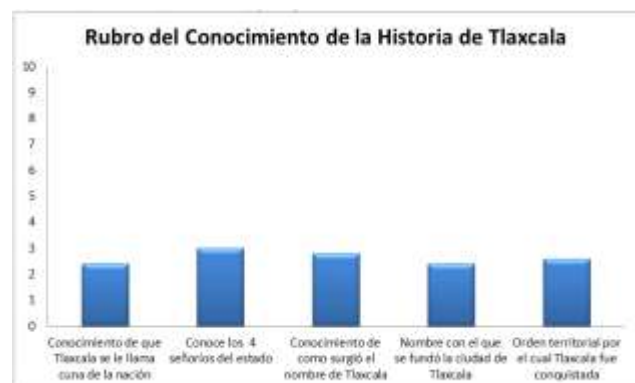

Figure 1 Results of knowledge of the history of Tlaxcala

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.
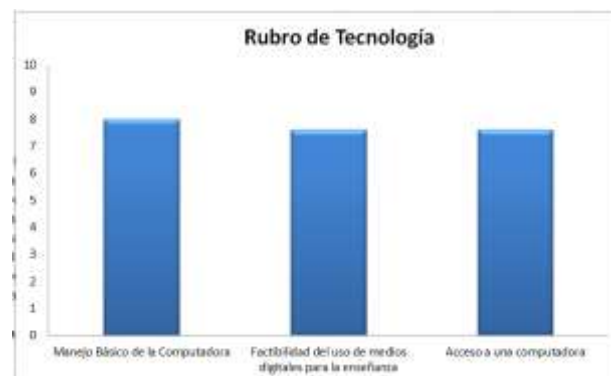

Figure 2 Results of the Technology Sector

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.

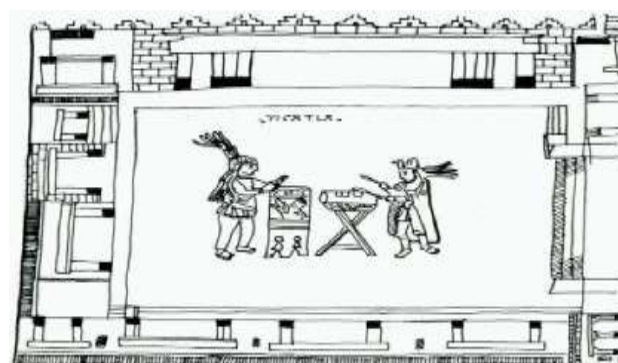**Figure 6** Plan of the Principal Tecpan or palace of Xicoténcatl
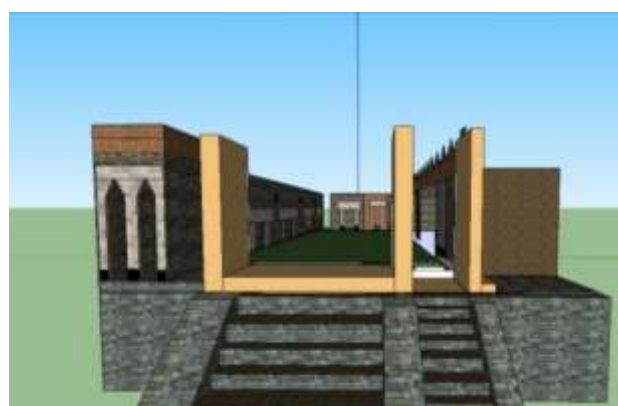

Figure 7 Tecpan de Tizatlán model

Señorío de Tepeticpac. For the Tepetícpac 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.
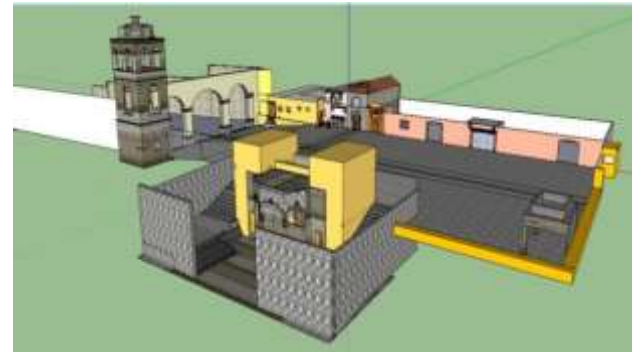
Figure 10 3D model of the former Franciscan convent of Tlaxcala

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.
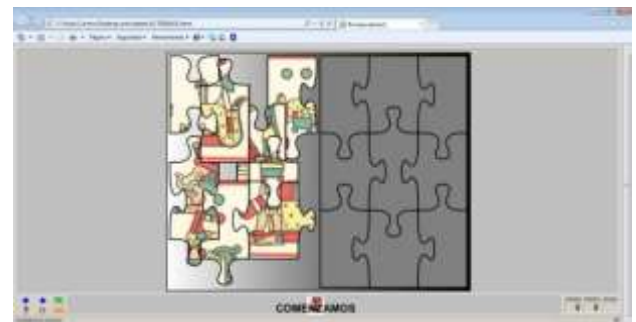
Figure 11 Final puzzle

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.
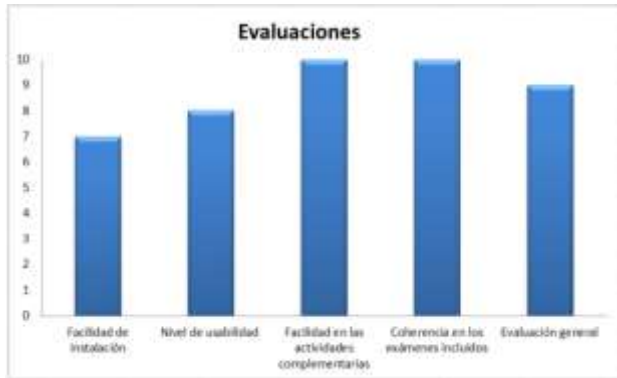
Figure 12 Results of the evaluation of the Interactive Book

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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Growth of the Toluca Valley and its effect on the disappearance of indigenous languages from 1990 to 2010: A historical-linguistic approach

Crecimiento del Valle de Toluca y su efecto en la desaparición de lenguas indígenas de 1990 a 2010: Una aproximación histórico-lingüística

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Abstract

The central objective of this study is to investigate the effect of the population growth in the Toluca Valley in the maintenance of indigenous languages. The hypothesis of this paper is to analyze how the rapid growth of Toluca Valley along with the industrialization and urbanization processes have accelerated the vanishing of indigenous languages at an alarming rate; however, growth, in particular, does not correspond to the increase in the number of speakers of indigenous languages in the region. Through a historical and linguistic approach in the municipalities: Toluca, Metepec, Zinacantepec, Lerma and San Mateo Atenco, the diminishing and endangered path of indigenous languages (nahuatl, mazahua y otomi) is portrayed. The analysis period considered for the analysis runs from 1990 to 2010. Finally, the hypothesis is tested and accepted: The growth rate of the Toluca Valley has an inverse relationship with the maintenance of indigenous languages and development in the region. Therefore, some linguistic policies are proposed in order to maintain and enrich the linguistic and cultural development of those indigenous linguistic communities in the region.

Maintenance of indigenous languages, Growth, Demise and language death, Linguistic policies

Resumen

El objetivo central del presente trabajo consiste en indagar el efecto que ha tenido el crecimiento del Valle de Toluca en el desplazamiento de las lenguas indígenas. La hipótesis del estudio es que factores como el crecimiento, la industrialización y urbanización del Valle de Toluca han acelerado la desaparición de las lenguas indígenas; sin embargo, el crecimiento no corresponde con el incremento en el número de hablantes de lenguas indígenas en la región. A través de una aproximación histórico-lingüística en los municipios: Toluca, Metepec, Zinacantepec, Lerma y San Mateo Atenco, se traza la desaparición de las principales lenguas indígenas (náhuatl, mazahua y otomí). El periodo de análisis considerado comprende desde el año 1990 hasta el 2010. Finalmente, se comprueba la hipótesis planteada, esto es, la tasa de crecimiento del Valle de Toluca tiene una relación inversamente proporcional con el mantenimiento y preservación de las lenguas indígenas, así como la caída en el índice de desarrollo de las zonas indígenas. A la luz de estos planteamientos, se proponen posibles políticas lingüísticas que abonen al mantenimiento y conservación de las lenguas indígenas y con ello abonar a la preservación de la diversidad cultural y lingüística de las comunidades indígenas de la región.

Mantenimiento de lenguas indígenas, Crecimiento, Muerte de lenguas, Políticas lingüísticas

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Introduction

To understand the effect and impact that the growth of the regions has in relation to the maintenance or displacement of languages, it is advisable to study this phenomenon from research on urban sociolinguistics (Butragueño, 2007). The axiomatic linguistic complexity demands the review of new proposals for interdisciplinary and multidisciplinary analysis in order to be able to explain the different problems surrounding the disappearance of indigenous languages, on the one hand, and on the other, to propose possible solutions and interventions for the benefit of those linguistic communities that are They are in a situation of vulnerability and unequal conditions, fundamentally. Likewise, this document recognizes the need to attend to one of the most urgent tasks observed in the Mexican territory: the marked social inequality of indigenous peoples.

Within the framework of Mexican socioliguistics, few studies focus on the analysis of urban linguistic phenomenology in the Mexican context (Garza, 2003; Guerrero, 2006; Lastra & Butragueño, 2000). According to (Butragueño, 2007): "Urbanization represents one of the most important social phenomena in recent years due to the transformation of ways of life that the contiguous movement of people from the countryside to the city means" (p. 9) . And he adds that despite the fact that migratory flows present a variety in their dynamics, the center of the country, and in particular, the State of Mexico continues to be an important attraction pole for industry and commerce. These last two factors explain, in part, the population growth registered in the entity under study: the Toluca Valley, made up of the municipalities: Toluca, Metepec, Zinacantepec, Lerma and San Mateo Atenco.

Historically, the Mexican territory at the beginning of the 20th century was mainly rural and it was not until the second half of the century that significant concentrations and population movements began to register towards the cities. Subsequently, the economic and social policies aimed at the modernization of the country generated conditions of enormous social inequality among the population and thus imposed the population growth residing in urban spaces in an accelerated manner starting in the 70s and 80s respectively.

In this sense, the following sections present a historical-linguistic approach with the purpose of reviewing some conditions and factors that determined the current geographical-linguistic configuration of the Toluca Valley. The main purpose is to propose language policies that contribute to the maintenance and conservation of the cultural and linguistic heritage of indigenous peoples, to pay for the reduction of conditions of inequality and extreme poverty among the indigenous population, mainly.

Next the problem of the study is developed, the antecedents; as well as the exposition of the interpretations based on the analysis of the historical data collected, finally, the proposal of linguistic policies around the maintenance of indigenous languages in the Toluca Valley is briefly described.

Description of the problem

In Mexico, social inequality represents probably the most serious structural problem that has affected the country. This situation breaks and prevents the addition and construction of a democratic scheme within the framework of equity, justice and freedom as expressed in the current official discourse.

Various factors have been attributed to this extreme and unjust inequality, namely political, economic, social and cultural. However, outside these processes are the problems associated with the use, management and distribution of indigenous languages that have a direct impact on the development of peoples. Inequality is also associated with scarce and limited access to linguistic resources that help to guarantee equal opportunities to maintain and preserve languages that are in vulnerable situations.

In this context, organizations such as CONEVAL (National Council for Evaluation of Social Development Policy) and UNICEF (United Nations Fund for Children), affirm that currently, in the country, there are 21.2 million Mexican children and adolescents in a situation of extreme poverty, the indigenous population being mainly affected (CONEVAL, 2014).

Despite the fact that the official discourse considers that economic inequality was reduced between the years 2010-2012 in people under 18 years of age, the poverty figures still remain on the alarm line with 4.7 million in extreme poverty. In 2012, the population range between 0 and 17 years old was located at a higher number 53.8% compared to the 2010 national poverty register, which was 45.5%. Among the groups of children in vulnerability, the levels of lack of health services and moderate or severe food insecurity stand out; that is, they do not have the necessary resources to maintain a required, healthy and varied diet. This situation has a direct and unfavorable impact on the permanence and maintenance of the linguistic diversity that exists in the country.

Background: Language as a resource for peoples

The conservation and preservation of the cultural and linguistic capital of indigenous peoples currently in Mexico has a direct effect on the rate of development of linguistic communities. The use and management of a language not only represents a right of the peoples, but is an inherent part of the resources they have to achieve their development and guarantee their existence. However, at present the development of indigenous peoples is located in the opposite direction and is outside the processes of economic growth and economic development of the different states.

The case that concerns us in this document concerns the analysis of population growth in the Toluca Valley and the main objective is to explain the decrease in the indigenous population in the announced municipalities as a result of the population flow registered in the periods 1990 to 2010. The main reason is the emergence of new urban settlements and the significant population growth observed in the state since 1990, surpassing the growth at the national level.

Despite the efforts of various experts and scholars in the field of linguistics worldwide, the results obtained from the review of sociodemographic data and econometric analyzes carried out, the panorama still seems arid in terms of the results obtained: while There is an apparent growth of the indigenous population, the number of users of indigenous languages decreases considerably.

Mexican academic experts have also had a notable in the different forums and congresses around the discussion on linguistic policies that promote the maintenance and revitalization of linguistic diversity on the planet. For example, the participation in the World Congress on Language Policies organized by Linguapax in Barcelona in April 2002 or in the recent Dialogue on Linguistic Diversity, Sustainability and Peace, which took place as the X Linguapax Congress within the framework of the Universal Forum of the Culturas de Barcelona, in May of that same year 2004. In this last participation of experts from all over the world, the relevance and relevance of the preservation and promotion of linguistic diversity throughout the world was highlighted. Likewise, the issue of the sustainability of linguistic diversity was recognized.

According to the Declaration of Universal Linguistic Rights proclaimed in Barcelona in 1996, the following stands out:

Article 1: This Declaration understands as a linguistic community any human society that, historically settled in a determined territorial space, recognized or not, identifies itself as a people and has developed a common language as a means of natural communication and cultural cohesion among its members. The name of a territory's own language refers to the language of the community historically established in this space.

Article 2: This Declaration starts from the principle that linguistic rights are both individual and collective, and adopts as a reference of the fullness of linguistic rights the case of a historical linguistic community in its territorial space, understood not only as a geographical area where this community lives, but also as an essential social and functional space for the full development of the language.

It is from this reference point that the rights that correspond to the linguistic groups referred to in point 5 of this article and those of people outside the territory of their community can be established as a gradation or continuum […]

Article 3: For the purposes of this Declaration, nomadic peoples in their areas of displacement or peoples of dispersed settlement are also considered as linguistic communities within their own historical territory.

Article 4: This Declaration understands as a linguistic group any human community that shares the same language and that is settled in the territorial space of another linguistic community, but without an equivalent historicity, as happens in various cases such as those of immigrant refugees, deportees or members of diasporas. (UN, 1996)

In this framework, the need is expressed not only to recognize the rights of the various linguistic communities, but since language is, in most cases, the only natural communication resource and cohesion among the members of a given community, its use, promotion and distribution, and with it its development and existence, must be guaranteed at all times.

For Lastra (1997), "the relations between language and society have certainly interested some language scholars since always, but they referred to them as anecdotal facts, or to explain linguistic changes in a language by studying its external history" (p. 17).

Methodology: A historical-linguistic approach to the Toluca Valley

The western region of the State of Mexico, which today is called Valle de Toluca, has a long history; The accumulated knowledge dates back to the middle of the 15th century when it was inhabited by Otomian language speaking groups along the lake area of an aquatic reservoir or lagoon fed by the current that was later called the Lerma River, currently a water channel blacks and waste from the industrial zone built in that space in the twentieth century.

Of this jurisdiction, referred to by the Mexica as the Matlazinco, its delimitation or historical integration is not known, so Albores (2006, p. 11) argues in favor of establishing as the beginning the destruction of the Toltec empire in the year 1162 and as an end around the year 1474 of our era when it was submitted by the members of the triple alliance. The Matlazinco of the indicated period can be divided into three zones based on the geophysical features and the predominant languages:

The northern or mountainous area, of the Otomí and Mazahua linguistic tradition –in coexistence with Matlatzinca and Nahuatl–; the southern area or of ravines in descending mountain ranges, of the Occupational tradition –in coexistence with the Matlatzinca and Nahuatl– and the central or lake area, of the Matlatzinca tradition –in contact with the Otomí, Mazahua and Nahuatl. While the central and northern areas are located in the upper Lerma of Mexico, the southern area is located in the initial basin of the Balsas river. (Albores, 2006; 15)

González's investigations (1999, p. 113) indicate that the Otomí and Matlatzincas that inhabited the region were conquered by Confederate forces under the command of Axayacatl.

Therefore, around 1478, a recognizable process of domination and Nahuatization began in the foundation of settlements or partialities, appointment of local lords from Tenochtitlan, imposition of tax burdens, control of the land and the workforce, aspects that resulted in deep social stratification. García (1999) also assures that with this fact the introduction of a different language occurred by pointing out that the region was inhabited by:

a large number of Otomian-speaking Indians: Otomies, Matlatzincas, Mazahuas, and Occupiers), as well as some recently introduced Nahuatl-speaking Indians. This area was the heart of the important lordships of Calixtlahuaca, Teotenango, and Malinalco and 36 other minor lordships that were subordinate to them in some way by the 15th century. All of them were subdued by the military forces of the Triple Alliance around 1470-1480. (two)

From the defeat of Tenochtitlan in 1521, a process of Spanish expansion began that not only modified the structure that administered the linguistic multiculturalism of the Matlatzinco region imposed by the Mexica, but also added a Catholic patronymic to the place name of the pre-Hispanic partialities. and other administrative units were formed with a population of Otomí, Matlatzinca and Nahua ethnic groups; that is, with different languages that were sought to evangelize separately and through translators from Spanish (González, 1999, pp. 114-115).

There was then a process of Castilianization of the Nahua that turned the word Matlatzinco into Matalcingo and the jurisdiction into Valle de Matalcingo or Valle de Toluca. According to Albores (2006) that "in an early stage of Spanish rule, Hernán Cortés self-assigned the jurisdiction of New Spain called" Matalcingo "or" Valle de Toluca and Matlatzinco "which encompassed the approximate (although smaller) territory of the old Otomian jurisdiction or Mesoamerican jurisdiction, prior to the Mexica domain "(p. 15). The author adds that as the colonial period advanced, the Valley of Toluca and Matalcingo was geographically reduced until only the central or lake area of what was originally the Otomian jurisdiction was called Valle de Toluca and where the town that would become the city of Toluca by royal cedula in 1599.

In the central zone or Valley of Toluca in the most recent version of the name of the region, Kanter (1992) includes Tenango del Valle, of which he makes a population study of the seventeenth century in which he concludes that "Life in the Valley of Toluca was shaped both by its numerous indigenous communities and by its strong economic ties with Mexico City. The indigenous population was much larger than the Spanish or the mestizo; These settlers, mostly Nahuatl-speaking, still maintained viable communities until the 19th century. These communities had voice and vote in local affairs and almost all of them still had good tracts of land from which the divisions were assigned "(p. 3).

The historical process of the 19th and 20th centuries generated two important phenomena that had and continue to have an impact on that indigenous and linguistic panorama that Kanter coined from the 18th century in the Toluca Valley region; In the first, the Indian, mestizo and Spanish peoples gave rise to the jurisdictional delimitation of the municipalities that founded the formation of the modern liberal State, and in the second. On these municipal frameworks, industrialization was implemented as a model of economic development, which had as a consequence, among others, the demographic concentration in that central region that geographically constitutes a typical valley and that, paradoxically, has erased the limits of the municipalities to conform a single large urbanized industrial zone, as Korsbaek (1992, p. 2) points out.

It is precisely this large urban area that is the geographical area of this study in which we try to know the evolution of the indigenous population and the situation of their languages, for which it was determined to monitor the five municipalities that already constitute the metropolis of Toluca. : Lerma, San Mateo Atenco, Metepec, Toluca and Zinacantepec.

General explanations on the disappearance of indigenous languages

In 2010, INEGI reported figures on the evolution of indigenous language speakers in each of the entities of the Mexican Republic, where Oaxaca showed a percentage of more than 30% of indigenous language speakers. In Graph 1, an apparent growth of the indigenous population is observed with respect to the total population from 1930 to 2010.

* Only the population aged 5 years and over is considered
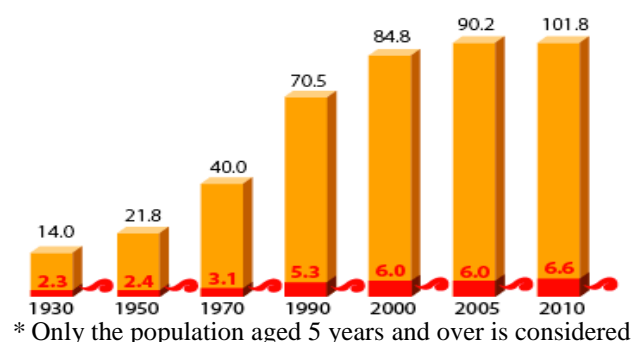
Graphic 1 Evolution in millions of the indigenous population

Now, with respect to the total population, the percentages are as follows:

Year	Total population*	Indigenous language speaking population (millions) *	Percentage of the population that speaks an indigenous language with respect to the total population
1930	14 028 575	2.3	16.0
1950	21 821 032	2.4	11.2
1970	40 057 728	3.1	7.8
1990	70 562 202	5.3	7.5
2000	84 794 454	6.3	7.1
2005	90 266 425	6.0	6.6
2010	101 808 216	6.6	6.5
* Only the population aged 5 years and over is considered			

Table 1 Percentage of population that an indigenous woman speaks with respect to the total population

The previous figures show that for 2010, according to INEGI, through the population and housing census and data accumulated by the Ministry of Public Education SEP in 2014 and the INALI (National Institute of Indigenous Language), revealed that there are 89 indigenous languages, of which 101 808 216 are registered as active speakers and belong to indigenous populations that have their own uses and customs. These minority groups dress, celebrate festivities, eat, coexist, in particular ways, bond and interact in a peculiar way with the world that surrounds them and in accordance with their conception of life.

However, a primary identification is their language that characterizes them, despite the fact that the census shows data that of every 100 people who speak an indigenous language, 14 of them do not speak Spanish. In addition, information was also obtained that the entities with the highest number of speakers of an indigenous language are located in the states of Chiapas and Oaxaca. That is to say, from the results shown by the population and housing census in 2010, they warn that in Mexico there are 112 336 538 inhabitants, ranked 11th worldwide for its number of inhabitants and among them, it is rescued from the document published in the parliamentary gazette.

That, INALI (2014) and PROINALI (2013-2018), Institutional Program of the National Institute of Indigenous Languages that: currently 15.7 million indigenous people are identified, of which 6.9 million speak an original language, and of these a one million 96 thousand 512 do not speak Spanish.

For its part, the SEP states that:

School attendance between 6 and 14 years of age at the national level, recognized by the 2010 population and housing census, is 19.8 million people of which 18.7 attend school, that is, out of every 100 children between 6 and 14 year old, 94 attend school; However, it is also indicated that: despite the distant sectors of the cities, where some indigenous communities are found and the fact that there are among them those who cannot speak Spanish, it makes it difficult for education to reach those places, but despite.

As a result of the difficulty, the school attendance of indigenous communities has increased in the last 10 years, with particular emphasis on the fact that the average schooling in indigenous language-speaking groups is the fourth year of primary school. It points out that indigenous education centers are organized into complete and incomplete schools; The first are those that have primary school grades from first to sixth and have a teacher for each group, and the second are those that have one teacher or more to attend a group or several, but do not cover all six grades. (multigrade schools).

However, despite these figures at the national level, the possibilities of access to education, security, basic food basket, employment, and health services experienced by the inhabitants of the different indigenous communities in the country point to a detriment in the index of very low development and contrasting extreme poverty levels.

In this context, Romaine and Nettle (2000) argue that language does not occur in a vacuum. For this reason, a deep understanding of the role that language has in the social processes that affect communities or linguistic groups is required. For this reason, language studies must be supported by other disciplines and frames of reference since they play a decisive role in the process of safeguarding the linguistic richness of Mexico.

In 2014, the newspaper El Economista published Graph 1, which shows the evolution of the amount of indigenous population aged five years or more, with respect to the entire national population, and the percentage of indigenous language speakers that this represented. of which the editor highlighted the closest census figure from the 2010 population census, which states that of the total of 101. 81 million Mexicans, only 6.6 million, that is, 6.5 percent, spoke an indigenous language. The central idea of the note tries to show that although there is a recovery of the indigenous population speaking their language, their representation with respect to the total population is in decline, which represents the loss of native languages and with it the extinction of their history and your culture.

Graphic 2 Indigenous-speaking population with respect to the total population in Mexico

In the news it is argued that the ups and downs of public policies were the cause of this current situation of the population and indigenous languages, since at the beginning of the 20th century they tried to Mexicanize them through Spanish as a national language as established by the Law of Rudimentary Instruction of 1911 and the application of the Nationalist Comprehensive Education program of 1913; With the policy of President Lázaro Cárdenas, it was proposed to integrate them without erasing their roots through the creation of the Department of Education and Indigenous Culture in 1934 and the Tabasco project in 1939; in 1963 the Secretary of Public Education (SEP) tried bilingual education without good results; In 1993, modernization sought to compensate indigenous people by trying to educate them in their own language, but without in-depth curricular reforms.

Finally, it highlights that in the last 20 years the educational plans contemplate the preservation of indigenous languages with measures such as the creation of the Coordination of Intercultural Bilingual Education, dependent on the SEP, and the promulgation of the General Law of Linguistic Rights of the Peoples Natives; but, the results are not yet perceived (08-10-2014).

The process of language extinction is currently measured through a methodology called the linguistic replacement index (or also known as the linguistic displacement index) which, in the case of Mexico, refers to the process of assimilation of the mother tongue by the Castilian.

The study of the intergenerational transmission of the language supposes the questioning of a common hypothesis that ensures that the greater the number of people who speak a language, it will be stronger and will have less risk of disappearing, therefore, in an exercise of the National Commission to the Development of Indigenous Peoples (CDI).

It is recognized that the decrease in the teaching of the language from one generation to another has its explanation in aspects such as discriminatory stereotypes towards the indigenous and lack of opportunity for those who do not speak Spanish; that is, there would be a direct relationship between conservation of the mother tongue with a low level of development and high marginalization, particularly in older generations, while young generations abandon their language to survive (CDI, s / a; 3-5).

Analysis and results of the evolution of the indigenous population in five municipalities of the Toluca Valley: Toluca, Metepec, Zinacantepec, Lerma and San Mateo Atenco

In the five municipalities that make up the current industrial and urbanized zone, once part of Matlatzinco, Matalcingo or Valle de Toluca, the following process can be observed in a rudimentary outline.

Year	Total population	Indigenous population	Population speaking the indigenous Otomí and Nahuatl languages
1990	66 912	11 625	3 230
2000	99 870	10 936	3 135
2005	105 578	8 011	2262
2010	134 799	7 623	2124

Table 2 Indigenous language-speaking population: Municipality of Lerma

It can be observed that in the municipality of Lerma in 1990 the indigenous population represented 17.3 percent of the total population and of that percentage only 4.82 percent spoke an indigenous language, either Otomí or Nahuatl; while in 2010 the indigenous population decreased to 5.65 percent of the total population of the municipality and that only 1.57 spoke one of the two indigenous languages.

Year	Total population	Indigenous population	Population speaking the Otomí and Mazahua indigenous languages
1990	140 268	2 223	764
2000	194 463	3 327	1180
2005	206 005	2 819	990
2010	214 162	2 390	546

Table 3 Indigenous language-speaking population: Municipality of Metepec

In the case of Metepec, the comparison of the data of the extreme dates showed that of the total population in 1990, 1.58 percent was indigenous and of this only 0.54 percent used the Otomí or Mazahua to communicate. By 2010, 0.25 percent of the indigenous population, which constituted 1.11 percent of the total municipality, spoke their mother tongue.

Year	Total population	Indigenous population	Population speaking the Otomí and Mazahua indigenous languages
1990	41 926	430	133
2000	59 647	645	199
2005	66 740	712	241
2010	72 579	801	174

Table 4 Indigenous language-speaking population: Municipality of San Mateo Atenco

In another of the riverside municipalities of the river and the Lerma lagoon, San Mateo Atenco, the indigenous language-speaking population changed as follows: in 1990, 1.02 percent were indigenous and only 0.31 percent practiced their mother tongue, while the 2010 census shows that the indigenous population increased to 1.10 percent; but, indigenous language speakers decreased to 0.23 percent.

Year	Total population	Indigenous population	Population speaking the Otomí and Mazahua indigenous languages
1990	487 612	51 009	22 438
2000	666 596	62 237	23 187
2005	747 512	52 683	17 730
2010	819 561	61 156	21 144

Table 5 Indigenous language-speaking population: Municipality of Toluca

In the municipality where the capital of the entity is located in 1990, the indigenous population represented 10.46 percent of the total and 4.60 percent spoke Otomí or Mazahua; In 2010, of the total population, 7.46 were indigenous and of this, 2.57 percent spoke the original languages.

Year	Total population	Indigenous population	Population speaking the Otomí and Mazahua indigenous languages
1990	83 197	3 974	1 088
2000	121 850	3 605	839
2005	136 167	2 803	656
2010	167 759	2742	579

Table 6 Indigenous language-speaking population: Municipality of Zinacantepec

In Zinacantepec, the last municipality in the metropolitan area, at the beginning of the last decade of the 20th century, 1.30 percent spoke an indigenous language, out of 4.77 percent of the population with this characteristic, with respect to the total municipal population. However, in 2010 the indigenous population decreased to represent only 1.63 percent of the total, at the same time that the indigenous language-speaking population decreased to 0.34 percent.

In a globalization exercise of the area that make up the five municipalities, it is observed that in 1990 there was a total population of 819,915, of which 69,261 was indigenous, a figure that represented 8.44 percent of the total and only 27,653 people; this is 3.37 percent communicated through one of the three predominant native languages.

However, in 2010, one hundred percent of the population consisted of 1,418,860 inhabitants, of which 5.26 percent were considered indigenous; However, only 1.72 spoke their native language, which represents the decrease of 1.65 percent of indigenous language speakers in a period of twenty years.

In light of these results, the hypothesis presented at the beginning is verified: factors such as growth, industrialization and urbanization of the Toluca Valley have accelerated the disappearance of indigenous languages; however, the growth does not correspond to the increase in the number of speakers of indigenous languages in the region. Although the data reflect that the increase in the indigenous population, this does not correspond to the increase in users of indigenous languages, but there is a possible relationship between the growth of the indigenous population in the Toluca Valley and the growing poverty rates. extreme, coupled with low development rates in indigenous communities.

Therefore, the most alarming indicator is the disappearance of indigenous languages in the Toluca Valley, the processes of linguistic and cultural assimilation into Spanish, probably the result of current prevailing public and educational policies, which place emphasis on promotion and learning. of Spanish as the dominant language.

However, and despite efforts to promote the main indigenous languages (Nahuatl, Mazahua and Otomí), inequality in access to education and other basic services for indigenous communities seems to contribute even more to the segregation and exclusion of people. the inhabitants limiting their access to equal opportunities in all areas of citizen participation.

Unfortunately, the various educational and cultural programs are not permanent nor do they belong to long-range social projects, as they derive from short- and medium-term government plans. In this context, and in the absence of public policies translated into effective language policies that contribute to a national project based on respect and guarantee of opportunities for all Mexicans in a context of linguistic and multicultural diversity. The proposal presented below has the main objective of ensuring that each member of an indigenous community is fully represented in the educational, linguistic, cultural, social and political levels, thereby avoiding marginalization and exclusion in the different spheres of citizen participation.

Linguistic policies for the maintenance and conservation of indigenous languages in the Toluca Valley: Proposal

Initially, the following question arises: how to maintain and preserve indigenous languages that are in continuous threat of disappearance or death in the complexity of our present realities and, in terms of human linguistic rights and linguistic democracy?

At present, and in light of this first historical-linguistic approach, we have a set of assimilationist linguistic policies that point to the following results:

–   Denial / limitation in education at all levels in the students' mother tongue (segregation and exclusion).

–   A large number of indigenous languages are of oral tradition, mainly and lack a writing system
–   (situation of the various dialect variants derived from the main languages of the region: Nahuatl, Mazahua and Otomí).
–   High illiteracy rates in indigenous communities, mainly.
–   Situation of extreme poverty among members of indigenous communities due to the scarcity of educational, cultural and linguistic opportunities.
–   High rates of marginalization and social exclusion.
–   Low levels of development in indigenous communities.
–   Lack of political representation of indigenous peoples.

Possibilities for change through effective language policies?

As has already been pointed out, there have been some important changes in the main languages such as Otomi and Nahuatl, but the data indicate a decrease in the number of users of these languages due to the lack of educational, employment, health and security offered to the speakers of these languages in the areas studied here. Therefore, it is necessary to design and implement language policies whose main objective is the preservation of linguistic-educational human rights, with special emphasis on the right to education through the mother tongue at all levels of training. of citizens of indigenous communities.

Without this last condition, the integral reproduction of the present generations of indigenous peoples will not be possible, since their integration into social life will always be forced towards the assimilation or else, towards the disappearance and death of indigenous languages and not towards a true process of acculturation.

The current educational system and the media represent the main agents leading to the displacement and death of indigenous languages. Behind them are accelerated and uncontrolled urbanization and growth; as well as the global economic, military, political and technological systems that contribute to the rapid process of disappearance of indigenous linguistic communities.

Given this, language policies should be thought from the following axes:

1. Use of the students' mother tongue as a means of instruction in the first years of schooling and gradual learning of the second language (Spanish) and third languages (foreign languages).
2. Maximum exposure and development of the mother tongue in all areas of citizen training.
3. Total eradication of illiteracy in indigenous communities.
4. Promotion of bilingual and trilingual literacy, as appropriate, at all educational levels and public spaces.
5. Development of teaching materials and resources in the mother tongue and second language that cover the different areas of knowledge (mathematics, science, language, arts, sports) and are not limited to some areas as at present (literature and culture).
6. Training of bilingual teachers (preferably, teachers should belong to indigenous communities).
7. Permanent bilingual cultural programs and activities with a medium and long-term focus.
8. Full political and legal representation for all members of indigenous communities.
9. Development of bilingual communication channels and media in all regions where indigenous communities are present.
10. Reorganization of the institutions that serve the different needs of indigenous peoples, which are equitably represented.
11. Autonomy for indigenous peoples. Freedom for its organization, management and distribution of resources.
12. Well-planned financial incentives from needs studies in which members of indigenous peoples participate.
13. Promotion of the cultural and linguistic capital of indigenous peoples through the inclusion of the media that is currently used to promote a dominant culture.
14. Publication of literature, history, and knowledge generated by members of indigenous communities.
15. Conservation and effective plans for the biodiversity of indigenous peoples.

Conclusions

As final reflections we have the following:

First, the hypothesis raised at the beginning of the research is verified, in which it is stated that factors such as growth, industrialization and urbanization of the Toluca Valley have accelerated the disappearance of indigenous languages.

Second, the loss of linguistic capital that influences the low level of development of indigenous peoples is evident.

Third, it was also observed that the registered growth does not correspond to the increase in the number of speakers of indigenous languages in the region. On the contrary, it is demonstrated that through a historical-linguistic approach in the municipalities: Toluca, Metepec, Zinacantepec, Lerma and San Mateo Atenco, this growth is inversely proportional to the maintenance of the central indigenous languages of the region.

Fourth, likewise, an accelerated process of disappearance of indigenous languages is evidenced due to the scarcity of effective linguistic policies that contribute to the maintenance and preservation of linguistic and cultural diversity in the Toluca Valley.

Fifth, neglect of the phenomenon of language displacement and its relationship with the latent danger of extinction of a large part of biodiversity puts at risk not only the members of linguistic communities, but the entire population in general, since inequality and its effects extend due to the lack of job, educational, cultural, health and safety opportunities that are concentrated in the great human centers. The social climate that is generated due to the disproportionate population growth that was registered from 1990 to 2010 in the Toluca Valley has accelerated the decline in speakers of indigenous languages, assimilating them more and more to the dominant culture. Otherwise, they are permanently discriminated against and socially marginalized.

Based on the sources consulted, this first historical-linguistic approach is achieved in the Toluca Valley, since although there were studies from separate historical and linguistic approaches, these had not been gathered in a single study as possible angles of analysis for inquire about the impact that the growth of the region has on indigenous linguistic communities.

Therefore, it is necessary to carry out more research on languages from other disciplines in order to pay for and enrich the angles of analysis and interpretation and thus contribute to projects that directly intervene in the solution of social problems.

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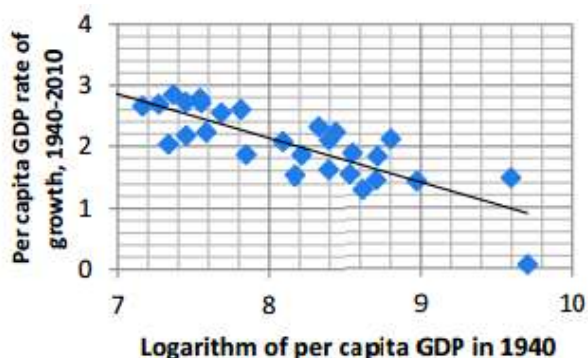
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