Article **Journal-Economic History**
June, 2020 Vol.4 No.6 1-8

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

MÉNDEZ, Sandra P. †*, AGUILAR, Laura, GARCÍA, Martha G. and GARCÍA, José P.

Universidad Tecnológica de Tula-Tepeji

ID 1st Author: *Sandra P., Méndez*

ID 1st Coauthor: *Laura, Aguilar*

ID 2nd Coauthor: *Martha G., García*

ID 3rd Coauthor: *José P., García*

DOI: 10.35429/JEH.2020.6.4.1.8 Received February 14, 2020; Accepted June 18, 2020

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

Citation: MÉNDEZ, Sandra P., AGUILAR, Laura, GARCÍA, Martha G. and GARCÍA, José P. Equity in technological higher education. A look from the Subsystem of Technological Universities in Mexico. Journal-Economic History. 2020. 4-6: 1-8

† 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)

ISSN 2524-2059
RINOE® All rights reserved

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

ISSN 2524-2059
RINOE® All rights reserved

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.

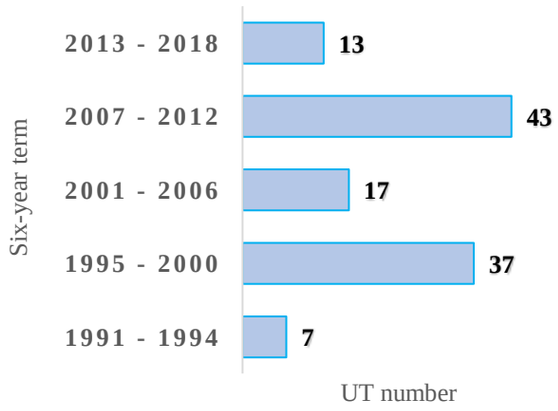
For Flores Crespo (2005) it was the unsatisfied desire to update their specialization at the undergraduate level and for De Garay (2006) the high expectations of being employed in productive activities related to their career that were not covered in reality.

ISSN 2524-2059
RINOE® All rights reserved

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.

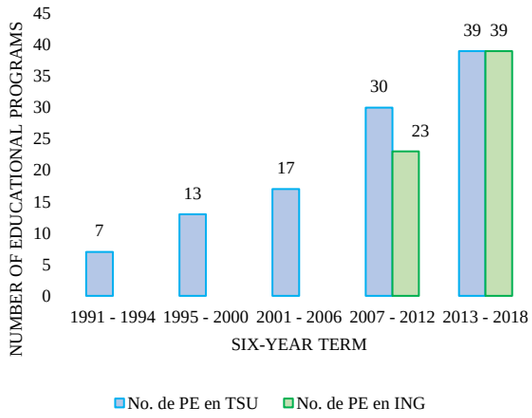
At present, the Technological Universities are distributed throughout the country (see illustration 1) and the SUT has a presence in the 31 States of the Mexican Republic, except in Mexico City; that is, there is at least one TU per State.

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.

ISSN 2524-2059
RINOE® All rights reserved



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).

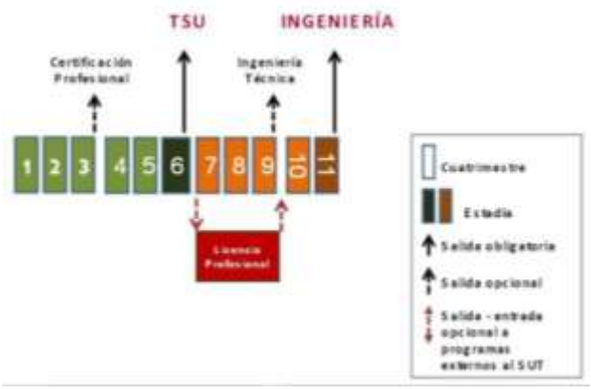
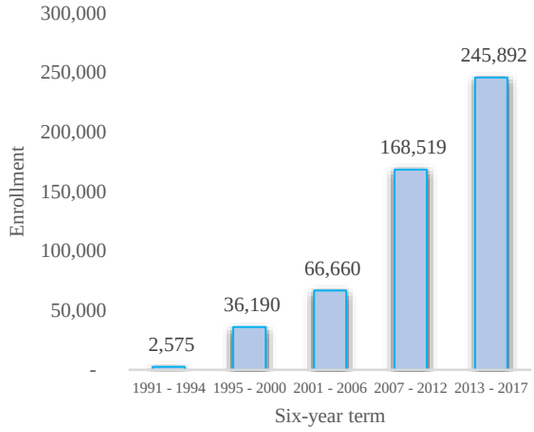


Figure 2 Curricular model of Technological Universities
Source: SEP-CGUT. (2008)

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.

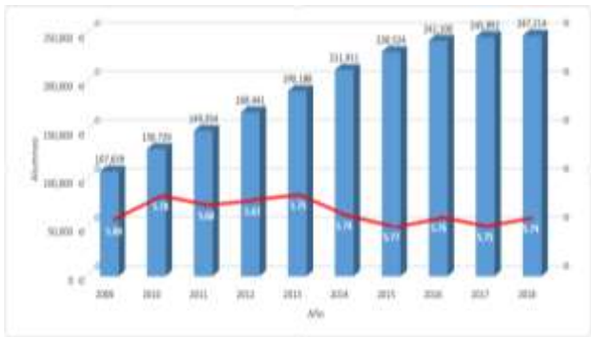


Graphic 3 SUT enrollment growth by six-year term
Source: Own elaboration based on CGUTyP (2018)

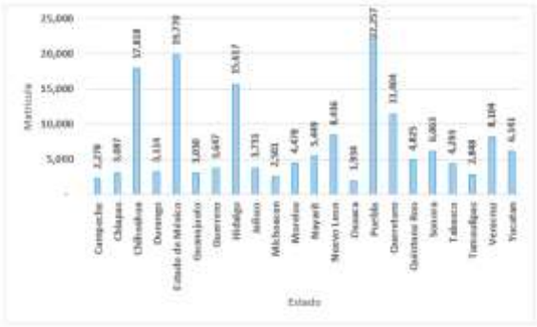
In addition to the enrollment indicator, Figure 4 also shows the behavior of the percentage participation percentage of the SUT in the Higher Education System, especially from the teaching of the Bachelor level.

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.

References

Bolívar, A. (2005). Equidad educativa y teorías de la justicia. REICE. *Revista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación*, *3(2)*, 42-69.

Coordinación General de Universidades Tecnológicas (CGUT) (2000). *Universidades Tecnológicas. Mandos Medios para la Industria*. SEP-CGUT-Noriega.

De Garay Sánchez, Adrián (2006). *Las Trayectorias Educativas en las Universidades Tecnológicas. Un acercamiento al modelo educativo desde las prácticas escolares de los jóvenes universitarios*. SEP-CGUT-Universidad Tecnológica de la Sierra Hidalguense.

Didou Aupetit, S. (2011). La promoción de la equidad en educación superior en México: declinaciones múltiples. Septiembre 2009. *REencuentro. Análisis de Problemas Universitarios,* (61), 7-18. https://www.redalyc.org/articulo.oa?id=340/34019137002

Flores Crespo, P. (2008). *Análisis de política pública en educación: línea de investigación.* Universidad Ibeoramericana. file:///C:/Users/SANDRA/Downloads/Analisis_de_politica_publica_en_educacio.pdf

Flores Crespo, Pedro (2005). *Educación Superior y Desarrollo Humano. El caso de tres universidades tecnológicas*. ANUIES.

https://www.redalyc.org/articulo.oa?id=551/55103205

Instituto de Estadística de la UNESCO. (1998). Clasificación Internacional Normalizada de la Educación, CINE 1997.

Instituto de Estadística de la UNESCO. (2012). Clasificación Internacional Normalizada de la Educación, CINE 2011.

Méndez Viera, S. (2020). Políticas Públicas y Equidad en la Educación Superior Tecnológica: El Caso de la Universidad Tecnológica de Tula-Tepeji. Trabajo de investigación en proceso para el obtener el Grado de Maestría.

Mercado-Suárez, Álvaro L., Amador-Cogollo, A. A., & Cabana-Gaviria, J. C. (2014). Políticas de acceso de la población vulnerable a la educación superior, una visión desde la experiencia de la Universidad del Magdalena. *Clío América*, *8*(15), 8-21. https://doi.org/10.21676/23897848.826

Muñoz Izquierdo, C. (2009). *¿Cómo puede la educación contribuir a la movilidad social? Resultados de cuatro décadas de investigación sobre la calidad y los efectos socioeconómicos de la educación (1968-2008).* Universidad Iberoamericana.

Poder Ejecutivo Federal (2001). *Programa Nacional de Educación 2001-2006*. México. Diario Oficial. http://dof.gob.mx/nota_to_imagen_fs.php?codnota=706000&fecha=15/01/2003&cod_diario=28401

Secretaría de Educación Pública - Coordinación General de Universidades Tecnológicas y Politécnicas. (2018). Solicitud de información estadística no. de folio EDUCA-0000156710. Documento no publicado.

Secretaría de Educación Pública - Coordinación General de Universidades Tecnológicas y Politécnicas. (2019). Solicitud de información estadística no. de folio SES-2019-001722. Documento no publicado.

Secretaría de Educación Pública- Coordinación General de Universidades Tecnológicas. (2008). Fortalecimiento del subsistema de Universidades Tecnológicas "su evolución al nivel de estudios 5A". Documento no publicado.

Secretaría de Educación Pública. (2017). Principales Cifras del Sistema Educativo Nacional Educativo 2016-2017. https://www.planeacion.sep.gob.mx/Doc/estadistica_e_indicadores/principales_cifras/principales_cifras_2016_2017_bolsillo.pdf

Silva Laya, M. (2012). Equidad en la educación superior en México: la necesidad de un nuevo concepto y nuevas políticas. *Archivos Analíticos de Políticas Educativas*, *20* (4). http://epaa.asu.edu/ojs/article/view/965

Silva Laya, M. (2014). Equidad en la educación superior mexicana: el reto persistente. *Universidades, (59),* 23-35. ISSN: 0041-8935. https://www.redalyc.org/pdf/373/37332547004.pdf

Silva Laya, M. y Rodríguez, A. (2012). *El primer año universitario entre jóvenes provenientes de sectores de pobreza: un asunto de equidad*. ANUIES.

Silva Laya, Marisol. (2006). *La Calidad Educativa de las Universidades Tecnológicas. Su relevancia, su proceso de formación y resultados*. ANUIES.

Villa Lever, L. (2017). *La construcción de oportunidades educativas en contextos de desigualdad*. ISS-CONACYT.