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## EDUCATION POLICY | REVIEW ARTICLE

# Moving from international rankings to Mexican higher education's real progress: A critical perspective

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**Abstract:** Higher education in Mexico is under an ongoing transition process influenced by global tendencies. The world is changing, and Mexico is striving to fulfill the latest requirements to be part of the “elite universities.” Although higher education literature has tracked Mexico’s progress, the tension between global tendencies and their effects on Mexican higher education institutions have not been explored. Drawing upon academic capitalism and the theory of power, this article examines not only the academic growth but also global tendencies in higher education—such as privatization, international ranking, and academic stratification



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### PUBLIC INTEREST STATEMENT

Today, international rankings determine the quality of Higher Education. The inclusion in rankings relies on the combination of various factors such as funding, research in STEM fields, awards, internationalization, historical reputation, etc. During the last decades, Mexican universities have struggled against economic, cultural, and developmental factors to fulfill such requirements. Nonetheless, Mexico does not have a single university within the top 100. This condition has brought waves of criticism to Mexican universities, especially from those who base their opinions on international standards. This paper is grounded on critical theory to underline that dominant discourse reflects neither the effect of global tendencies on higher education nor the real progress made in term of science and technology in Mexico. Drawing on Academic Capitalism and the Theory of Power, the authors suggest that international rankings are shaped by dominant voices that exert their power to keep hegemonic relations that benefit those in top positions.

—that act as policy-drivers to reshape educational policy in Mexico. Furthermore, it examines current strategies in higher education policy, seeking to decipher its focus on science and technology as result of globalization pressure. The authors suggest higher education policy in Mexico is shaped by dominant voices that exert their power to keep current hegemonic relations that benefit those in top positions. Also, they assert the detrimental effects of current policies deserve to be explored.

**Subjects:** Higher Education; Sociology of Education; Education Policy & Politics

**Keywords:** higher education; global tendencies; academics; academic capitalism; theory of power; science and technology

### 1. Introduction

The efforts to improve science and technology in Mexico aim to diminish a multitude of critical issues that constraints its development. In 2013, World University Rankings—considered as the lead standard of rankings in global higher education—came out with its list of the world’s top universities. Neither then, nor now has Mexico had a single university represented within the top 100. This condition matched with some studies (Brunner, Santiago, García-Guadilla, Gerlach, & Velho, 2008; Gómez-Merino, Trejo-Tellez, Méndez-Cadena, & Hernández-Cazarez, 2017) that underline a late development and poor performance in higher education, in terms of science and technology. In this regard, Felsen (2013) asserts that rankings themselves cannot fully capture the progress made by Mexican institutions in strengthening their academic standards and in raising their global profiles in recent years. He highlights an ongoing misunderstanding of international rankings, particularly from scholars, who guided by international standards, hastily judge higher education’ progress in Mexico.

This paper explores the global tendencies in higher education—such as privatization, international ranks, and academic stratification—which act as policy-drivers to reshape educational policy in Mexico. As Levinson, Sutton, and Winstead (2009) propose, we use a critical approach to examine the ways in which power and discourse are intrinsic in educational policy construction. Therefore, we review past and current domestic strategies in higher education policy, seeking to decipher its focus on science and technology. Our analysis is grounded in critical perspectives, drawing on academic capitalism and the theory of power as the theoretical framework, as an attempt to understand strengths and opportunities in higher education in Mexico.

In this paper, we use academic capitalism, explained as an organizational behavior that occurs in response to the actions of external agents who control the resources (Nixon, 2004) as an attempt to understand the growing interest in science and technology as the primary goal of higher education. Levinson et al. (2009) assert that “the critical approach emphasizes the production of education policy as a contested political process in which dominant groups position themselves best to order an education system in its own vision and interests” (p. 774). Thus, our inquiry adopts critical approaches, informed by the work of Foucault (1977). Bazul and Carter (2017) consider that the work of Michel Foucault has been applied in numerous fields in wide-ranging ways, demonstrating there is no “one use” of Foucault. Hence, we draw on Foucault’s truth and power theory to explain higher education lags in Mexico. As Foucault, we also think that “truth is a thing of this world: it is produced only by multiple forms and constraints” (Foucault, 1980, p. 109).

To guide our analysis, we attempt to underline the cross-linking conditions that constraint science and technology evolvement. Therefore, we consider economic and social factors that led to the partial privatization of higher education; we also emphasize the power and influence that private sector exerts on higher education policy. Furthermore, we tackle the role of international ranks reinforcing STEM policies in Mexican educational system. Finally, we consider the academic

stratification and its effects on the centralization of scientific capabilities. Those conditions represent the crossroads where the country is, in relation to international tendencies in science and technology, regardless what the international rankings say.

Throughout this paper, we seek to critically analyze the current state of science and technology and higher education in Mexico, its strengths and opportunities. We put an especial emphasis on understanding the main dilemmas that HEIs have face during the last days. Therefore, our analysis is guided by three main topics. First, global trends that have reshaped higher education in Mexico are explored. Second, we review the strategies that the Mexican government has used to respond to the pressure of global trends in higher education. Third, we weight on the strengths and opportunities that Mexico face while higher education institutions (HEIs) are dealing with global trends on Higher education. Throughout the article, we highlight the ways academic capitalism is permeating and influencing the Mexican education system' strategies. In addition, we engage critical viewpoints related to truth, power, as crucial factors mediating policy construction, as in any other social practice.

## **2. Global trends impacting higher education in Mexico**

Some scholars (Gacel-Avila, 2005) argue that government's policies have a prominent role on education lags; however, it remains as crucial to acknowledge that those policies might be imposed by internal and external factors. Currently, HEIs undergone major transformations fueled by the twin forces of neoliberalism and globalization. To understand this point, it is important to consider that prior to 1982, Mexican education policies were shaped by an exacerbated need to boost enrollment growth. However, after a new economic crisis in 1982, the International Monetary Fund (IMF) conditioned a "rescue package" to deep changes in higher education policy—among other structural shifts in the country. Thereafter, concerns related to enrollment growth were replaced by quality and efficiency. Therefore, the cultivation of the intellect, the central objective of university life, started being threatened by political and economic pressures that are redefining and reshape the functions of higher learning (Axelrod, 2002). The latest changes led to a new audit culture (Apple, 2007) that has diminished institutional autonomy, and increase the emphasis on knowledge production for the industrial sector. As Slaughter and Rhoades (2004) suggest, this "new" dynamic led college and faculty members to interact market-like behaviors. As result, the fields of science, technology, engineering and mathematics (STEM) became a priority. In the following section, we address three of the most relevant global trends in higher education and their impact on Mexican higher education policy.

### **2.1. Privatization**

Some scholars (Boggs, 1997; Pusser, 2011) explain that major reductions in government funding might be explained by notions of individual responsibility and academic capitalism (Slaughter & Leslie, 1999). As a result, a new era of financially driven policies started. Unfortunately, those new policies have not positively impacted education's investment in Mexico. According to the World Bank (2017) the investment in science and technology has remained stagnant between 0.4% and 0.6%.

However, economic factors themselves cannot fully explain the privatization process of higher education. Clark (1998, 2000, 2004) highlights two significant phenomena that shed light on the private-sector participation in educational systems. First, the growing demand for tertiary degrees, spurring many governments to open the door to the private sector. In the case of Mexico, private enrollments have stagnated at around 33% (National Association of Universities and Institutions of Higher Education [ANUIES], 2012). Second, the government constant request to the private sector to assist them to solve societal problems. Clark (1998, 2000, 2004) considers them as key facts to explain the privatization of higher education. Slaughter and Rhoades (2004) explain these conditions obligate universities to shift from "public good knowledge regime" to an "academic

capitalism knowledge regime” (p. 28). These factors shed light on the presence and relevance of a new key player in Mexican higher education: the for-profit sector.

In 2000, one of the leaders of the industry, U.S. based Sylvan Learning Systems (now Laureate International Universities) bought the first of several universities in Mexico, the Mexico Valley University (UVM). The company later acquired The Professional Development University (UNIDEP) and the Mexican Technological University (UNITEC); together, the three institutions enroll more than 130,000 students in dozens of campuses throughout Mexico (Millán, 2014). In 2008, Mexican largest beer manufacturer, Grupo Modelo, bought the ETAC University network for \$ 20 million. The university now forms part of the alliance Aliat-ETAC, with 50 campuses in 18 states including the capital (Millán, 2014). As expected, the private sector has an active participation in both providing higher education and reflecting their own interests in policy construction. Hence, it is critical to consider the private sector’s role as a factor that boosts interest in STEM fields.

## 2.2. The university rankings

The international university ranking is another factor impacting HEI transformation. The Academic Ranking of World Universities emerged in 2003 as a dominant measure of institutional performance. The rankings respond to demands of classifying institutions for the benefit of potential consumers and bringing order to a progressively chaotic higher education market (Ordorika & Lloyd, 2015). Nowadays, rankings reward institutions with the highest levels of production in the STEM fields relying primarily on easily measurable indicators of scientific production, the number of articles published in internationally indexed journals, and Nobel Prize winners. Today, such institutional branding is an important part of the efforts to attract international talent—both students and academics—which in turn improve the institutions’ standing in the rankings. Therefore, HEIs are expected to adjust themselves as an attempt to fit into first-class universities.

University rankings influence current strategies in higher education in an international context. Some governments—including Mexico, France, Spain, Russia, Malaysia, Ecuador, and Peru—have also seized on the rankings either to justify existing higher education strategies or to promote new ones (Ordorika & Lloyd, 2013). This is the case with the government-funded study abroad programs in the STEM fields, which often rely on the rankings to determine where to send scholarship students abroad (Ordorika & Lloyd, 2013). In the case of Mexico, the government has increased its support to studies abroad; however, this is conditioned to the access to top ranked universities. To do so, since 1971 the National Council of Science and Technology (CONACYT by its Spanish acronym), operates not only science and technology issues but also administers Mexican funds to studies abroad for Mexican graduate students. Although the number of scholarships for graduate studies grew dramatically from 5,197 in 1993 to 53,000 in 2014, only 5,535 of these scholarships were granted abroad (Sánchez, 2014). There are two important facts that explain this discreet growth in studies abroad. First, the scholarship program gives priority to students studying in the STEM fields. Second, the government is giving preference to students accepted at top-ranked universities—preferably in Europe, Canada, and the United States (Sánchez, 2014).

Mexican Government preferences have led to a controversial debate among academics and policy-makers. Mexican academics question rankings’ methodologies and its implications on HEIs with a discrete development in sciences and technology. In 2012, the National Autonomous University of Mexico (UNAM) hosted an international conference on the rankings, entitled *The Latin American Universities and the International Rankings: Impacts, Scope, and Limits*. At the end of the conference, many university presidents in Latin America universities signed a statement questioning the role of the rankings in determining from university funding to institutional strategic planning (Final Declaration, 2012). Some scholars in Mexico are striving to raise awareness about the negative effects of international ranks on HEIs located in developing countries (Martínez, 2011; Villaseñor, Moreno, & Flores, 2015). Mexican scholars argue that empowered universities, consciously or unconsciously, exert influence education policy around the world. Those policies may have had an adverse effect on powerless universities, mostly located in developing countries.

Therefore, we embrace Foucault's teachings, as an attempt understand the role of power in higher education policy around the world. As he said, "each society has its regime of truth, its general politics of truth: that is the type of discourse which it accepts and makes function as true... the status of those who are charged with saying what counts as true" (Foucault, 1980, p. 131). Therefore, those in power will exert hegemonic discourse as an effort to keep the status quo, and that discourse cannot fully explain Mexican higher education progress objectively.

### **2.3. Academic stratification**

As we mentioned above, HEIs are transforming in several ways. Emerging changes are mostly influenced by privatization which brought an increased interest in STEM fields and international rankings as determining policy drivers (Ordorika & Lloyd, 2013). During the first half of the twentieth century, HEIs were characterized by a relatively standardized educational offer, and similar staff recruitment procedures (Eurydice, 2000; Shin & Teichler, 2013). Nevertheless, this situation has been challenged by recent transformations. In the 1980s and 1990s, problems generated by "mass higher education" led to offer education diversification to handle with a growing diverse student population (De Vries & Álvarez, 2014; Galaz et al., 2012). Thereafter, stratification became a phenomenon that permeates higher education policy (Estévez & Martínez, 2011; Galaz et al., 2012; Gil Antón, 2009; Stromquist, 2009) around the world, including Mexico. Today, performance indicators have been introduced to monitor institutions' results but also as determining factors to distribute funding resources. As result, in many countries, full-time teaching jobs are giving way to poorly-paid hourly positions (Altbach, 2000; Stromquist, 2009). In Mexico, only 34% of professors in the public sector and 8.4% in the private sector held tenured positions in 2013 (UNAM, 2015). The rest held a combination of part-time and hourly jobs, often at multiple institutions, limiting their financial earnings and capability to conduct research.

Stratification in higher education makes clear differences on the types of qualifications, which are associated with differentiated rewards in the labor market or other beneficial outcomes. Past studies (Reimer, Noelke, & Kucel, 2008; Van de Werfhorst, 2008) have shown that different fields of study have different occupational returns in terms of wages, unemployment risks, occupational status and affect individuals' consumption patterns and socio-political orientations (Van de Werfhorst, Kraaykamp, & De Graaf, 2001). This pattern is also affecting higher education in Mexico.

The increasing stratification is becoming a demonstration of power in Mexico, especially among teachers and researchers, with the latter group deemed as more valuable in its contribution to the knowledge society. Since 1984, when the government linked the salaries of top scientists to their scientific production after creating the National System of Researchers (SNI) the financial division became particularly extreme. In 2015, there were 23,316 SNI members (CONACYT, 2016), who received substantial bonuses depending on their levels of production. The system currently offers bonus which ranges from \$750 to \$1,750 in a monthly basis. Today, SNI members are considered as part of the elite working in Mexican universities (Didou & Gérard, 2011). In many regards, their voices are the guidelines to define HEIs performance and research topics. Nowadays, those privileged professor-researchers represent a minority of university professors, with just 3.7% of the 380,000 professors employed nationwide (UNAM, 2015).

As Foucault (1998) said, "power is everywhere and comes from everywhere, so in this sense is neither an agency nor a structure, instead is a kind of meta-power or regime of truth that permeate society, and which is in constant flux and negotiation" (p. 63). Mexican higher education is a good example of the influence of power in policy construction. Global tendencies such as private-sector participation in higher education, international rankings, and academic stratification are themselves policy-drivers reshaping educational policy and strategies across the country.

### **3. Higher education strategies to get in international university rankings**

According to the ANUIES (2012), higher education is moving forward, despite several challenges in the past. The association asserts that the main problem is due to science and technology policies



had not been efficiently linked to national development strategies. The Scientific and Technological Advisory Forum (FCCyT by its Spanish acronym, 2006, 2013) underlines that budgets at all three levels of government reflected in the past a low priority consigned to the sector. However, global tendencies' effects—privatization, international ranks, and academic stratification—on HEIs in Mexico have forced the government to revert this condition. Currently, the Mexican government is striving through different federal programs to facilitate the transition to an era of science and technology in the country. During the next session, we review the main federal strategies aimed to enhance STEM policies and programs as an attempt to get access to international rankings.

### 3.1. The CONACYT

Currently, this federal program is considered as the main doorway to science and technology in Mexico. Therefore, its strength is a priority in national policy. The development of science and technology in Mexico during the 1970s was a weak link that educational policy has attempted to strength (CONACYT, 2014; Hernández, 2002). Unsurprisingly, human and institutional capabilities available for generating and adopting new knowledge proved meager. As an effort to counteract this situation, the government established the CONACYT and tripled expenditure for science and technology. Currently, the scholarship program for postgraduate studies absorbs one-third of CONACYT's financing, making it the largest program in the country (CONACYT, 2014). These efforts allowed the funding of scholarship programs to train highly qualified human resources. Furthermore, it allowed the funding for research in basic science and technological infrastructure (CONACYT, 2014, 2016; Corona, Dutrénit, Puchet, & Santiago, 2013).

Science and technology growth in Mexico has historically depended on federal support throughout the last decades. Thus, its transformation is highly linked to CONACYT's growth. Also, science and technology progress has depended on different leadership that has supported its transformation in different ways. Vicente Fox's presidential term (2000–2006) is characterized by elevating the compulsory promotion of science to a constitutional status. During Fox's administration, the CONACYT's Organic Law and the Science and Technology Law were enacted in 2002. This new normative framework was especially helpful, as it smothered the lack of coordination between authorities and agencies involved in the operation of CONACYT (Thiri6n & Oliver, 2004). Therefore, the attainments during this period were bound to the creation of new legal dispositions.

The diagnoses devised by presidents Felipe Calder6n's (2007–2012) and Enrique Pena Nieto's (2013–2018) teams agreed on the under-funding situation that science and technology faced in the last decades. In this context, policies made through both administrations consisted of a set of instruments aimed at bonding science and technology and the national productive sectors as an effort to funding innovation, science, and technology. Calderon and Pena Nieto administrations encouraged the investment in basic and applied science. Both administrations sought the improvement of scientists' qualifications, but also the decentralization of science as an attempt to strengthen the different regions in the country. They also showed interest in the modernization of the country's scientific and technological infrastructure. Their efforts were reflected in the 2014 National budget, which allocated 2,288.7 million of pesos to the renewal, substitution, and construction of scientific and technological infrastructure, a budget 300% bigger, compared to 2012. However, despite the growing support and investment, some scholars (Gil Ant6n, 2012; Kent, 2014; L6pez-Z6rate, 2014) warn that Mexico's budget is still below OECD countries. However, Mexico does not just rely on CONACYT to improve science and technology. Concurrently, the government funds different programs, seeking to transform higher education.

### 3.2. SNI

The SNI is a federal program that contributes to CONACYT's efforts to strengthen science and technology. Today, Mexican government considers as a priority to increase the number of researchers throughout the country to better position national universities in international ranks. The SNI has been operating for over three decades as a device for recognizing and certifying generations of Mexican scientists who conduct research, publish in specialized journals, and form

human resources. Therefore, evaluating its members, the SNI relies almost exclusively on the number of indexed publications, while giving little weight to quality, the level of innovation or the degree of coordination with other agents of the national innovation system. Certainly, these strategies have allowed the formation of human capital and the creation of a solid base of researchers supporting science and technology activities. The SNI has been effective in drawing in new practitioners and containing the emigration of Mexican academics. In 1984 SNI recognized 1,396 members, by 2016, this figure reached 25,072 (Rodríguez, 2016). The program also allows the strength of the exchange and cooperation among academics, scientists, and private sectors (Dutrénit & Arza, 2010).

The SNI program has brought satisfactory outcomes. In 2017, there were 5,813 research groups registered in Mexico, formed by full-time professors who have the recognition of the ideal profile –27,238 in total at public HEIs—of the Teacher Development Program (PRODEP, 2017) of Mexican Secretary of Public Education (SEP). The areas with the largest number of consolidated research groups are Natural and Exact Sciences (23.5%), Engineering and Technology (22.4%) and Social and Administrative (21.7%) (Teacher Development Program [PRODEP], 2017) (see Table 1).

Further, the program itself seems to contribute to decentralize scientific skills in the country. According to Enrique Peña Nieto’s second government report, a good progress was made in the distribution of researchers throughout the states: 35.2% out of 21, 358 of SNI researchers, reside in Mexico City, while 64.8% reside in different states of the country (see Presidencia de la República, 2015). However, there is still a lot to do as those numbers confirm that research project funding and infrastructure continues to favor institutions from states with greater scientific maturity, thus current policies have not completely taken down territorial differences. As result, better-positioned institutions are still absorbing both a larger number of qualified (SNI members) researchers and therefore, researching funds.

After realizing that most of the national researchers are in the biggest cities, a decentralization campaign started to compensate this situation. Peña Nieto’s administration enacted the Lectures for Young Researchers program. This project aims the incorporation of more than 3000 doctors into HEIs and research centers across the 32 states of the country (CONACYT, 2014).

However, despite the increasing number of researchers, it is still insufficient to meet the demands on knowledge and technology in the country (CONACYT, 2014). Higher Education analysts (De Vries & Álvarez, 2014; Galaz et al., 2012) have criticized the overvaluation in the increases of these indicators. They argue that from the beginning, those policies were planned to reorganize the academic work and get better results in research and teaching and to have more consolidated faculties.

**Table 1. Number of research groups by area of knowledge and development level**

Area of knowledge	Consolidated	In consolidation	In training	Total
Agricultural	105	125	123	353
Education, Humanities and Art	186	257	485	928
Engineering and Technology	305	413	1015	1733
Natural and Exact	320	255	250	825
Health	148	183	217	548
Social and Administrative	295	437	694	1426
Total	1359	1670	2784	5813

Note. Own devising based on data from PRODEP (2017)

#### 4. Strengths and opportunities after global trends effecting higher education in Mexico

Global trends in higher education—such as privatization, international ranks, and academic stratification—have led the Mexican government to apply a variety of strategies to respond to their pressure on national HEIs. Federal programs such as CONACYT, SNI, and Lectures for young researchers have proven to be effective to contend international pressure, but also a virtuous tool to develop science and technology in the country. According to the Organisation for Economic Co-operation and Development [OECD], (2014) academia evolvement and scientific and technological growth have been improved over the last decades. This evolvement is reflected on both the growing number of indexed publications in the field of natural and exact sciences (i.e., healthcare, agricultural, engineering, and technology) and the rising number of PhD awarded in those fields (Kent, 2014). Undoubtedly, this is a result of the unprecedented support to HEIs, field-study diversification, the increase of professors-researchers, the growing number of students in tertiary education, and the study programs offering a scientific training.

Apparently, government' strategies to promote science and technology among Mexican students has paid off. According to CONACYT (2014) from 1971 to 2007, CONACYT granted more than 150,347 scholarships for studies in Mexico and abroad. By 2014, CONACYT held 52,403 active scholarships, 88% of which were for postgraduate studies within the country and 9.9% for postgraduate studies abroad (CONACYT, 2014).

Although CONACYT has overtly acknowledged the valuable efforts from different fields, the STEM fields' contributions are constantly praised. Disciplines such as Engineering Sciences, Biotechnology, Physics and Mathematics and Earth sciences, among others are considered as nourishment to the science and technology training offered by HEIs to Mexican students. Students' enrollment in STEM fields grew significantly over the last decades. The ANUIES disclosed data that shows the burst of STEM fields' enrollment, which went from 235 641 to 498 441 from 1998 to 2012, respectively. Table 2 shows the students enrolled in STEM disciplines (46.5%) and non-STEM disciplines (53.5%).

Mexican students have access to STEM fields through 646 institutions and universities across the country (ANUIES, 2017). The SEP ranks institutions forming the following profiles: federal public, state public, public technological, and public research center. All of them contribute in different degrees to develop science and technology. However, Santelices (2010), reports that federal and state public research institutions, compound the base of the academic system that produces more science and technology. Figure 1 shows the location of the main public institutions—federal, state and technological. The map shows a centralized higher education system despite the efforts to decentralize it. There is still a high concentration in the center and south of Mexico.

The limited number of qualified researchers is the constraining factor that Mexican government is attempting to defeat. According to the CONACYT (2017), only 226 of 646 public HEIs have a

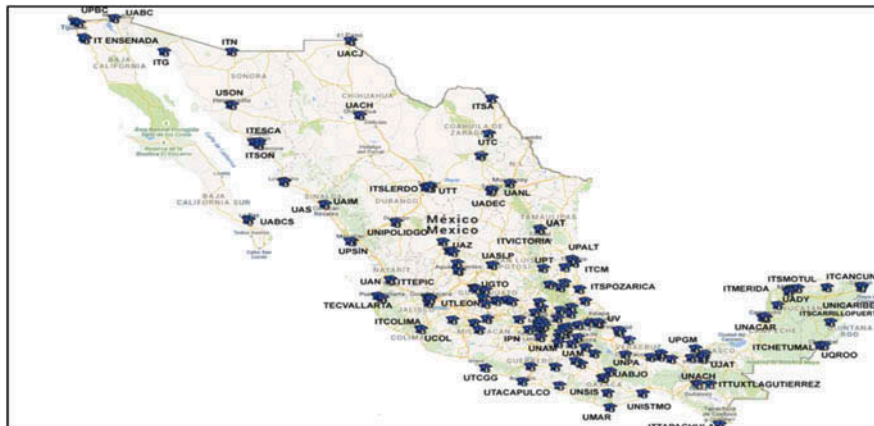
**Table 2. Student enrollment in 2016–2017 for first degree programs in Mexico**

Field	N	%
Agricultural sciences	92,722	2.5
Health sciences	444,102	11.8
Natural and exact sciences	205,326	5.5
Social and administrative sciences	1,690,093	44.9
Education and humanities	325,946	8.7
Engineering and technology	1,004,016	26.7
Total	3,762,205	100

Note. Generated from Statistical Yearbook 2017 of the ANUIES (This classification corresponds to the six study areas applied by the ANUIES since 1983 for higher education).



**Figure 1. Geographic distribution in Mexico of HEIs and Research centers that produce research.**



minimal quantity of researchers recognized by the SNI in STEM fields. The limited number of researchers recognized by the SNI, along with the global trends in higher education encouraged the Mexican government to increase and strength of the teaching/research force. President Pena Nieto's administration has supported the CONACYT's longest standing instruments for the strengthening of highly qualified human capital: scholarships for postgraduate studies and the SNI. Today, the rise of teachers/researchers is reflected two interesting ways.

First, the number of SNI researchers in Mexico grew tenfold during the last 31 years. While there were only 833 researchers registered in 1998, this number escalated to 23,316 by 2015. Biology and Chemistry (17.10%); Physics, Mathematics and Earth sciences (16.21%) are the fields with a larger number of researchers (CONACYT, 2015). By 2015, there were 5,376 research groups registered in Mexico, which embody 20,271 full-time professors at public and private HEIs (PRODEPT, 2017).

Second, the reinforcement of research force caused academic indicators blooming in the country. The number of indexed publications significantly grew throughout the last years. In 1999, there were 4,379 published documents on indexed journals. By 2008, there were 9,294 published documents on indexed journals (Intersectoral Committee for Innovation [CII by its Spanish acronym, 2011). As result, in 2012, the Global Innovation Index located Mexico on the 79<sup>th</sup> place out of 143 countries, and on the 63<sup>rd</sup> place by 2013 (Ministry of Economy, 2013). Further, the scientific academic growth was reflected in the number of patent applications. In 2000, from 431 patent applications, just 3.2% were requested by Mexicans. The percentage increased to 6.1% of 951 applications by 2010. Similarly, the patents granted increased from 118 in 2010 to 229 in 2010 (FCCyT, 2011). Interestingly, in spite of the positive signs that Mexican higher education system has shown, international organizations are questioning its evolution.

## 5. Conclusion

Universities are "charged with special responsibilities for producing the future political, business and civic leaders" (Gerald & Haycock, 2006, p. 3). Therefore, public universities were founded on the premise that higher education should be the doorway to better opportunities but also as a promise to increase knowledge. In the past, their primary purpose was educating the masses to ensure the strength and competitiveness of human capital" (Campbell, 1995, p. 38). Nevertheless, when public universities fell short in enrolling a mass population (Jaquette, Curs, & Posselt, 2016) as many countries, Mexico did not have options but partially transfer its duty to educate the coming generations to private sectors. Thereafter, the inclusion of private sector in education policy building has played an important role reshaping higher education.

Meanwhile, Mexico does not have a single HEIs within top 100 international ranking, some studies (e.g., Gil Antón, 2012; OECD, 2014) suggest a slow and inefficient education policy leading HEIs in Mexico. Moreover, the OECD (2014) asserts that the interaction between research agents in México is still limited, weak, and irregular to consolidate a real system of innovation that could ease the transition towards a knowledge-based society and economy. Paradoxically, the OECD has also acknowledged the efforts and advances that Mexico has done in the past toward its inclusion in international ranks (see AHELO 2012 report). Although these conditions seem to be unfavorable to better position Mexican HEIs in top rankings, remains as crucial to critically consider the factors that mediate the current situation of higher education in Mexico.

Throughout this paper, we highlight that higher education quality standards switched from social good to science and technology standards development. Therefore, when private sector got involved in education policy construction, a new perspective changed the traditional mission to promote the share and creation of knowledge. Afterward, STEM fields became a priority in Mexican HEIs. This behavior matched with academic capitalism as a unique hybrid that ties scientific search and the maximization of profits (Münch, 2016). Robert Münch explains this phenomenon turns universities into enterprises competing for capital accumulation and business into knowledge producers looking for new findings that can be turned into patents and profitable commodities.

In the case of Mexico, one of the most powerful corporates, Laureate International U., educates more than 130,000 students after buying three HEIs—UVM, UNIDEP, and UNITEC—(Millán, 2014), proving that in Mexico, education is something that may be sold or bought. The private sector has considered STEM field as crucial to boosting economies all around the world. Today, it is essential to acknowledge that HEIs in Mexico are increasingly dependent on the market requirements and opportunities posed by a globalized world (Clark, 2000). During the last years, some scholars warned that letting economic values become the foundation of higher education threatens the traditional mission of educating mass and the search for knowledge (Rubins, 2007). For that moment, an academic capitalism arose to demonstrate that power can permeate everything, including education freedom. Hence, we argue that the investigation of how certain forms of academic capitalism, power, and truth interrelate in moment-to-moment interactions in education policy construction in Mexico deserve more exploration.

Grounding our analysis on critical perspectives and inspired in Foucault's teachings, we concluded that top-ranked universities and private sector assume "the control" on the promotion of science and technology to keep the status quo. Exerting hegemonic roles, both powerful universities and private sector determine the terms and conditions of success in international rankings. As result, it is complicated for powerless universities, mostly located in developing countries, to be competitive and successful. The conditions mentioned above intensify the relevance of international rankings and academic stratification, which are themselves manifestations of power. According to Foucault, "Power is not omnipotent or omniscient—quite the contrary! If power relationships have produced forms of investigation, of analysis, of models of knowledge, etc., it is precisely not because the power was omniscient, but because it was blind..." (Foucault, 1977, p. 183).

Today, the manifestation of Power in Mexico as Foucault (1977) suggests is permeating education policy at least in two different ways. First, education policy in Mexico has an empowered group of researchers, working in STEM fields, who are getting public recognition. They are in control of science and technology in the country. As result, social sciences fields, and all those who do not fit in STEM fields have been set aside. Today, higher education is the scene of hegemonic relationships, where empowered and disempowered actors struggle for recognition. Hence, there is an imminent risk. Those privileged groups might be a "tribe" who decide what is researched, and who are part of the "elite groups."

Second, from stratification, higher education differentiation is of interest if different types of qualifications are associated with differentiated rewards in the labor market or other beneficial

outcomes. A lot of studies to mention (e.g., Reimer et al., 2008; Van de Werfhorst, 2008) have shown that different fields of study have different occupational returns in terms of wages, unemployment risks, occupational status and affect individuals' consumption patterns and socio-political orientations (Van de Werfhorst et al., 2001).

Nowadays, stratification is receiving increasing attention both from international organizations and academic scholars (OECD, 2008; Shavit, Arum, & Gamuran, 2007). For Mexico, it is fundamental to comprehend if the ongoing stratification triggers the development of new disciplines and emergent fields of study might contribute to increase general knowledge. There is no need to abandon Foucault's (1977) general analysis of power in all this, as he says:

If we wish to change the distribution of scientific knowledge and prestige in society through a new kind of science education, then the study and practice of science education needs to address issues of the political economy and the semiotics of scientific knowledge and skill are deeply embedded in issues of power, risk, trust, legitimacy, and in-group/out-group distinction and ranking (p. 1454).

At this time, we still do not know the effects of academic stratification in the development of emergent fields in the future, the efforts to improve science and technology and to get access to international rankings have both altered the goals and leadership of traditional HEIs. Therefore, while researchers underline scientific and technological lags in higher education, possible aftermaths of privatization, international rankings, and academic stratification deserve to be explored and understood.

Undeniable, the new circumstances in the national and international contexts require profound changes; however, latest national strategies stimulated sustained growth in science and technology, yet not spectacular, but constant. Those strategies are also reflected in the increase of highly qualified researchers, who are dedicated to science and in the growth of Mexican scientific production. For some international agencies (e.g., OECD), those improvements are not enough, and this paradoxical situation further motivates studies of how higher education, science, and technology are constructed in the Mexican context, out of the "Western" perspective. Hence, it is imperative to deconstruct its evolution and current state to better understanding the progress made during the last decades.

Finally, it is important to acknowledge that global market is unpredictable and its requirements might change. Therefore, HEIs should not respond strictly to market demands, even when is they might have led by the private sector. On the contrary, HEIs should find a balance between current market requirements and their traditional goals or future ones. But most of all, education researchers' concerns should also be oriented to understand the effects of current policies on the development and evolution of other than STEM fields.

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## References

- Altbach, P. (2000). The deterioration of the academic estate: International patterns of the academic work. In P. Altbach (Ed.), *The changing academic workplace* (pp. 11–33). Boston: Center for International Higher Education.
- Apple, M. (2007). Ideological success, educational failure? *Journal of Teacher Education*, 58(2), 108–116. doi:10.1177/0022487106297844
- Axelrod, P. (2002). *Values in conflict: The university, the marketplace, and the trials of liberal education*. Montreal, Canada: McGill-Queen's University Press.
- Bazul, J., & Carter, L. (2017). (Re) considering Foucault for science education research: Considerations of truth, power, and governance. *Cultural Studies of Science Education*, 12(2), 435–452. doi:10.1007/s11422-016-9800-2
- Boggs, C. (1997). The great retreat: Decline of the public sphere in late twentieth-century America. *Theory and Society*, 26(6), 741–780. Retrieved from <http://www.jstor.org/stable/657934>
- Brunner, J., Santiago, P., García-Guadilla, C., Gerlach, J., & Velho, L. (2008). *OECD Reviews of tertiary education*. France: OECD Publications.
- Campbell, J. (1995). *Reclaiming a lost heritage: Land-grant and other higher education initiatives for the twenty-first century*. Ames, IA: Iowa State University.
- Clark, B. (1998). *Creating entrepreneurial Universities: Organizational pathways of transformation*. Oxford, UK: Pergamos.
- Clark, B. (2000). *Collegial entrepreneurialism in proactive universities*. Oxford, UK: Change.
- Clark, E. (2004). Delineating the character of the entrepreneurial university. *Higher Education Policy*, 17(4), 355–370. doi:10.1057/palgrave.hep.8300062
- Corona, J. M., Dutrénit, G., Puchet, M., & Santiago, F. (2013). La co-evolución de políticas STI, el sistema de innovación y el ambiente institucional en México [The co-evolution of STI policies, the innovation system and the institutional environment in Mexico]. In G. Crespi & G. Dutrénit Eds., *Políticas de ciencia, tecnología e innovación para el desarrollo. La experiencia latinoamericana* (pp. 21–50). México: Foro Consultivo Científico y Tecnológico. Retrieved from [http://www.foroconsultivo.org.mx/libros\\_editados/politicas\\_de\\_cti.pdf](http://www.foroconsultivo.org.mx/libros_editados/politicas_de_cti.pdf)
- De Vries, W., & Álvarez, G. (2014). Los éxitos y fracasos de las políticas de educación superior [The success and failure of policies for higher education]. In H. Muñoz (Ed.), *La universidad pública en México. Análisis, reflexiones y perspectivas* (pp. 15–35). México: UNAM-Porrúa.
- Didou, S., & Gérard, E. (2011). El Sistema Nacional de Investigadores en 2009: ¿Un vector para la internacionalización de las élites científicas? [The National System of Researchers in 2009: A vector for the internationalization of scientific elites?]. *Perfiles Educativos*, 33(132), 29–47.
- Dutrénit, G., & Arza, V. (2010). Channels and benefits of interactions between public research organizations and industry: Comparing four Latin American countries. *Science and Public Policy*, 37(7), 541–553. doi:10.3152/030234210X512043
- Estévez, E., & Martínez, J. M. (2011). El peso de la docencia y la investigación desde la visión de los académicos de una universidad pública mexicana. El caso de la Universidad de Sonora [The weight of teaching and research from the vision of the academics of a Mexican public university. The case of the University of Sonora]. *Archivos Analíticos De Políticas Educativas*, 11(12), Retrieved from <http://epaa.asu.edu/ojs/article/view/832>
- Eurydice. (2000). *Two decades of reform in higher education in Europe: 1980 onwards*. Luxemburg: European Commission.
- Felsen, D. (2013). International Business Times. Retrieved from <http://www.ibtimes.com/higher-education-mexico-quest-become-more-competitive-globally-1439744>
- Final Declaration. (2012, May 18). *Latin American Universities and the international rankings: Impact, scope and limits final declaration*. Mexico: National Autonomous University of Mexico. Retrieved from <http://www.encuentro-rankings.unam.mx/Documentos/Final-declaration-english.pdf>
- Foucault, M. (1977). *Discipline and Punish: The birth of the prison*. London: Allen Lane.
- Foucault, M. (1980). *Truth and power*. New York: Pantheon.
- Foucault, M. (1998). *The history of sexuality: The will to knowledge*. London: Penguin.
- Gacel-Avila, J. (2005). The internationalization of higher education: A paradigm for global citizenry. *Journal of Studies in International Education*, 9(2), 121–136. doi:10.1177/1028315304263795
- Galaz, J., Gil, M., Padilla, L., Sevilla, J., Martínez, J., & Arcos, J. (2012). La educación superior mexicana en la encrucijada: Temas para una agenda de políticas públicas [Mexican higher education at the crossroads: Issues for an agenda in public policy]. In J. Galaz, M. Gil, L. Padilla, J. Sevilla, J. Arcos, & J. Martínez (Eds.), *La reconfiguración de la profesión académica en México* (pp. 23–42). Mexico: UAS-UABC.
- Gerald, D., & Haycock, K. (2006). *Engines of inequality: Diminishing equity in the Nation's premier public Universities*. Washington, DC: The Education Trust.
- Gil Antón, M. (2009). ¿Segmentación o diversificación? Una aproximación a las condiciones de la profesión académica en México [Segmentation or diversification? An approach to the conditions of the academic profession in Mexico]. In N. Stromquist (Ed.), *La profesión académica en la globalización* (pp. 53–100). México: D.F: ANUIES.
- Gil Antón, M. (2012). *Reporte final. Evaluación de la coherencia y los resultados del programa de apoyo al fortalecimiento y desarrollo de la infraestructura científica y tecnológica* [Final report. Evaluation of consistencies and results of the program to support the strengthening and development of scientific and technological infrastructure]. México: Colegio de México. Retrieved from [http://www.foroconsultivo.org.mx/documentos/grupo\\_trabajo/grupo\\_de\\_evaluacion/4/basica\\_infraestructura/evaluacion\\_externa\\_infraestructura\\_gil\\_colmex.pdf](http://www.foroconsultivo.org.mx/documentos/grupo_trabajo/grupo_de_evaluacion/4/basica_infraestructura/evaluacion_externa_infraestructura_gil_colmex.pdf)
- Gómez-Merino, F., Trejo-Tellez, L., Méndez-Cadena, M., & Hernández-Cazarez, A. (2017). Education, science, and technology in Mexico: Challenges for innovation. *International Education Studies*, 10(5), 115–128. doi:10.5539/ies.v10n5p115
- Hernández, R. (2002). La política de la ciencia y de la tecnología en México. La educación científico-técnica y la formación de recursos humanos [The politics of science and technology in Mexico. Scientific and technical education and training of human resources]. *Aportes*, VII(20), 87–94. Retrieved from <http://www.redalyc.org/pdf/376/37602007.pdf>
- Intersectoral Committee for Innovation. (2011). *Programa Nacional de Innovación* [National innovation program]. México: Secretaría de Economía. Retrieved



- from [file:///C:/Users/eeste\\_000/Downloads/programa\\_nacional\\_de\\_innovacion.pdf](file:///C:/Users/eeste_000/Downloads/programa_nacional_de_innovacion.pdf)
- Jaquette, O., Curs, B., & Posselt, J. (2016). Tuition rich, mission poor: Nonresident enrollment growth and the socioeconomic and racial composition of public research universities. *The Journal of Higher Education*, 87(5), 635–673. doi:10.1353/jhe.2016.0025
- Kent, R. (2014). La expansión, diferenciación e institucionalización del Sistema de Ciencia y Tecnología en México: Una interpretación neo-institucionalista [The expansion, differentiation and institutionalization of the science and technology system in Mexico: A neo-institutionalist interpretation]. In H. Muñoz (Ed.), *La universidad pública en México. Análisis, reflexiones y perspectivas* (pp. 327–350). Mexico: UNAM-Porrúa.
- Levinson, A., Sutton, M., & Winstead, T. (2009). Education policy as a practice of power. *Educational Policy*, 23(6), 767–795. doi:10.1177/0895904808320676
- López-Zárate, R. (2014). El financiamiento público: ¿escaso y mal distribuido? [Public funding: Scarce and poorly distributed?]. In H. Muñoz (Ed.), *La universidad pública en México. Análisis, reflexiones y perspectivas* (pp. 409–424). México: UNAM-Porrúa.
- Martínez, F. (2011). Los rankings de universidades: Una visión crítica [University rankings: A critical view]. *Revista de la Educación Superior*, XL(1), No. 157, 77–97.
- Millán, A. O. (2014). *Transnational capital devours private universities*. Asia Pacific University. Retrieved from [http://www.asiapacifico.edu.mx/index.php?option=com\\_content&view=article&id=370:el-capital-transnacional-devora-a-las-universidades-privadas&catid=19:reflexiones-de-rectoria&Itemid=52](http://www.asiapacifico.edu.mx/index.php?option=com_content&view=article&id=370:el-capital-transnacional-devora-a-las-universidades-privadas&catid=19:reflexiones-de-rectoria&Itemid=52)
- Ministry of Economy. (2013). *Propuesta de un programa de innovación* [Proposal innovation program]. México: Gobierno de la República.
- Münch, R. (2016). Academic capitalism. *Oxford Research Encyclopedia of Politics*, 1–25. doi:10.1093/acrefore/9780190228637.013.15
- National Association of Universities and Institutions of Higher Education. (2012). *Inclusión con responsabilidad social. Una nueva generación de políticas de educación superior* [Inclusion with a social responsibility. A new generation of higher education policies]. México: ANUIES.
- National Association of Universities and Institutions of Higher Education. (2017). Anuario estadístico 2016–2017. In *Población escolar de la educación superior* [Statistical yearbook 2016–2017. School population of higher education]. México: ANUIES.
- National Autonomous University of Mexico. (2015). *Estudio Comparativo de las Universidades Mexicanas Explorador de Datos* [Data Explorer of the Comparative Study of Mexican Universities]. México: UNAM. Retrieved from <http://www.execumunam.mx/>
- National Council for Science and Technology. (2014). *Programa Especial de Ciencia, Tecnología e Innovación* [Special program of science, technology and innovation 2014–2018]. México: CONACYT. Retrieved from <http://www.siicyt.gob.mx/index.php/normatividad/nacional/631-3-programa-especial-de-ciencia-tecnologia-e-innovacion-2014-2018/file>
- National Council for Science and Technology. (2015). *Investigadores en el SNI 2015* [Researchers in SNI 2015]. México: CONACYT. Retrieved from [conacyt.gob.mx](http://conacyt.gob.mx)
- National Council for Science and Technology. (2016). *Reporte de auto-evaluación enero-diciembre 2016* [Self-assessment report January–December 2016]. México: CONACYT. Retrieved from <http://www.siicyt.gob.mx/index.php/transparencia/informes-conacyt/informe-de-autoevaluacion/informe-de-autoevaluacion-2016/3750-inf-autoevaluacion-2016-ene-dic-file>
- National Council for Science and Technology. (2017). *Investigadores SNI Vigentes por Área de Conocimiento 2017* [Current SNI researchers by knowledge field 2017]. México: Author.
- Nixon, G. (2004). Academic capitalism and entrepreneurial college leadership or lessons in how to juggle. *Leadership Abstracts*, 17(12). Retrieved from <http://www.league.org/publication/abstracts/leadership/labs0412.htm>
- Ordorika, I., & Lloyd, M. (2013). A decade of international university rankings: A critical perspective from Latin America. In P. Marope, P. Wells, & E. Hazelkorn (Eds.), *Rankings and accountability in higher education: Uses and misuses* (pp. 209–234). Paris: UNESCO.
- Ordorika, I., & Lloyd, M. (2015). International rankings and the contest for university hegemony. *Journal of Education Policy*, 30(3), 385–405. doi:10.1080/02680939.2014979247
- Organization for Economic and Co-operation Development. (2008). *Tertiary Education for the knowledge-society*. Paris: OECD Publishers.
- Organization for Economic Co-operation and Development. (2012). *Assessment of Higher Education Learning Outcomes (AHELO)*. Paris: Author.
- Organization for Economic Co-operation and Development. (2014). *Iberoamerican report: Outlook of OECD on science, technology and industry 2014*. Paris: Author.
- Presidencia de la República. (2015). *3er Informe de Gobierno* [3rd governance report]. México: Gobierno de México.
- Pusser, B. (2011). A critical approach to power in higher education. In A. Martínez-Aleman, B. Pusser, & E. Bensimion (Eds.), *Critical approach to the study of higher education: A practical introduction*. Baltimore: Johns Hopkins University Press.
- Reimer, D., Noelke, A., & Kucel, A. (2008). Labor market effects of field of study in comparative perspective. *International Journal of Comparative Sociology*, 49(4–5), 233–256. doi:10.1177/0020715208093076
- Rodríguez, C. (2016). *El Sistema Nacional de Investigadores en números* [The national system of researchers in numbers]. México: FCCyT.
- Rubins, I. (2007). Risks and rewards of academic capitalism and the effects of presidential leadership in the entrepreneurial university. *Perspectives in Public Affairs*, 27(4), 3–18. Retrieved from <https://www.asu.edu/mpa/Entre%20University.pdf>
- Sánchez, M. D. (2014). *Los programas de posgrado y becas del CONACYT y su impacto en el desarrollo de la ciencia y la tecnología en México* [Graduate programs and CONACYT's scholarships and their impact on the development of science and technology in Mexico]. México: CONACYT. Retrieved from <http://transdisciplinariocinvestav.mx/Portals/transdisciplinario/SiteDoc/Otros/Posgrado%20y%20becas%20impactos%20en%20la%20CT%20junio%202014.pdf>
- Santelices, B. (2010). *El rol de las universidades en el desarrollo científico y tecnológico. Educación Superior en América Latina. Reporte 2010* [The role of universities in scientific and technological development. Higher education in Latin America. Report 2010]. Chile: Centro Interuniversitario de Desarrollo.
- Scientific and Technological Advisory Forum. (2006). *Conocimiento e innovación en México: Hacia una*



- política de Estado. Elementos para el Plan Nacional de Desarrollo y el Programa de Gobierno 2006–2012* [Knowledge and innovation in Mexico: Towards a State policy. Elements for the National Development Plan and the Program for Government 2006–2012]. México: FCCyT.
- Scientific and Technological Advisory Forum. (2011). *Ranking de producción científica mexicana* [Mexican scientific production ranking]. México: FCCyT.
- Scientific and Technological Advisory Forum. (2013). *Propuestas para contribuir al diseño del PECITI 2012–2037* [Proposals to contribute to the design of PECITI 2012–2037]. México: FCCyT.
- Shavit, Y., Arum, R., & Gamuran, A. (2007). *Stratification in Higher Education: A comparative study*. Stanford, CA: Stanford University Press.
- Shin, J., & Teichler, U. (2013). The future of University in the post-massification era: A conceptual framework. In J. Shin & U. Teichler (Eds.), *The future of the post-massified university at the crossroads: Restructuring systems and functions* (pp. 1–12). New York, NY: Springer.
- Slaughter, S., & Leslie, L. (1999). *Academic capitalism, politics, policies, and the entrepreneurial University*. Baltimore: Johns Hopkins University Press.
- Slaughter, S., & Rhoades, G. (2004). *Academic Capitalism and the new economy: Markets, state, and higher education*. Baltimore: Johns Hopkins University Press.
- Stromquist, N. (2009). Introducción. La profesión académica frente a las cambiantes expectativas sociales e institucionales [Introduction. The academic profession in the face of changing social and institutional expectations]. In N. Stromquist (Ed.), *La profesión académica en la globalización. Seis países, seis experiencias* (pp. 13–52). México: ANUIES.
- Teacher Development Program. (2017). *Evaluación de los programas sociales apoyados con subsidios y transferencias* [Evaluation of social programs supported with subsidies and transfers]. México: PRODEP. Retrieved from <http://www.dgesu.ses.sep.gob.mx/documentos/DSA%20gobmx/4to.%20Trim%202017%20PRODEP.pdf>
- Thiri6n, J., & Oliver, R. (2004). La política de ciencia y tecnología en México, progresos y limitaciones [The science and technology policy in Mexico, progress and limitations]. In P. García, L. Gutiérrez, & G. Torres (Eds.), *El Nuevo Milenio. Tomo IV Los retos sociales* (pp. 355–374). México: UAM.
- Van de Werfhorst, H. (2008). Educational fields of study and european labour markets. Introduction to a Special Issue. *International Journal of Comparative Sociology*, 49, 227. doi:10.1177/0020715208093075
- Van de Werfhorst, H., Kraaykamp, G., & De Graaf, N. (2001). Intergenerational transmission of educational field resources. *The Netherlands' Journal of Social Sciences*, 36(2), 188–210.
- Villase6n, J., Moreno, C., & Flores, J. (2015). Perspectivas actuales sobre los rankings mundiales de universidades [Current perspectives on world university rankings]. *Revista de la Educaci6n Superior*, XLIV(3), No. 175, 41–67.
- World Bank. (2017, October 5). *The World Bank*. Retrieved from <https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS?locations=MX>



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