





Analysis of institutional competitiveness of junior high schools through the admission Test to High School Education

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ABSTRACT

This descriptive and correlational research studies 15,658 students from 335 secondary schools in the state of Chihuahua, Mexico, through the results of the examination of admission to high school education (National High School Admission Test - EXANI I from the National Assessment Center for Education - CENEVAL) on logical-mathematical and verbal reasoning, mathematics and Spanish, comparing along the variables of sex, system (public or private), type of school of origin (there are seven types) and ranking of grades, with which, the main objective is to identify levels of institutional competitiveness. The main findings of the research were: (i) private schools, in comparison with public ones, showed percentages of more favorable grades (60.54 and 43.58 respectively); (ii) influence of the academic average of the students in the result of the examination of admission (correlation of .0403; (iii) greater competence in the area of verbal reasoning (56.47) compared to logical-mathematical reasoning (55.69); and (iv) the identification of a small number of secondary schools considered as having sufficient institutional competitiveness (11 schools, equivalent to 3.28% of the total).

KEYWORDS: INSTITUTIONAL COMPETITIVENESS; ACADEMIC EVALUATION; EDUCATIONAL CAREERS; ADMISSION TEST; JUNIOR HIGH SCHOOLS; HIGH SCHOOLS.

1 INTRODUCTION

Educational Assessment is a very complex process since the indicators or parameters for analysis used to measure these results vary in a wide range of elements, and do not necessarily address the current academic context.

Even though assessment is an institutional strategy to determine the importance or the qualities the student has developed and could be applied in a classroom environment, such as knowledge, attitudes and performance, we also know that this process conveys certain selection actions related to students who aim to enroll in a higher education institution (Cárdenas Ayala, 2012).

In order to understand the complex educational assessment dynamics, it is necessary to analyze if it really impacts the student's

academic development or if the sole purpose would be to regulate and select. Almost unavoidably, students remain in the midst of this dilemma throughout their academic journey.

The fundamental aspect of assessment is to lead the students' learning process and to create alternatives or strategies to improve the educational system. However, this notion of assessment that serves only to define the level of learning achievement seems too detached from reality, which varies from the natural selection of participants and the continuation of the status quo (Cliff & Montero Rojas, 2010; Mora, 2004;).

Considering this with a critical approach, when assessment is applied only as a quantified element and disregards socio-emotional elements, it might seem an improper, ineffective action since it only aims to provide for the assessor's expectations.

The previous argument poses the risk of a fragmented and partial perception of the assessed subject, this is not only due to the notion of assessment itself, but also caused by the manner in which it affects the student's performance, or the checking process, and by considering that every assessment process might present an incorrect balance (García-Castro & Bartolucci, 2007; Villardón Gallego, 2006).

By considering hard numerical data, the dynamics in modern institutions foresee assessment as an effective strategy to measure the effectiveness of processes and redirect them to obtain better results.

This quantitative trend is representative of the scientific approach for social analysis which defines the subject either as competent or not, and it might provide mechanisms so teachers and managers develop individual, collective and institutional feedback (González Rey, 2000; Álvarez Hernández, Aguilar Parra, Fernández Campoy, Salguero García, & Pérez-Gallardo, 2013).

One of the goals of this research is to assess institutional competitiveness according to the results of students in the admission exam for high education. The exam itself, even as a selection tool, poses a diagnostic and self-assessment opportunity for the institution to better understand this process, and to identify practical tasks performed by professors, managers, and directors (Mora Vargas, 2004; Torres Valderrama, 2012).

By doing this, the results of the program, the teaching experience, and the elements that, from a political administrative view, influence the production of a favorable academic setting are assessed. Although there might be items from the social context which are very difficult to modify, it becomes unavoidably necessary to perform a critical assessment of these items, which

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includes forward planning that will allow outstanding changes in the reality these educational institutions face (González Villalobos, Hernández, & López, 2011).

The analysis of the theoretical framework on admission processes to educational centers shows a series of similar features, mainly focused on two aspects: those related to the admission to higher education, and the determination of predictive validity as the desired element for the success of students once they have achieved enrollment in the formal educational system (González Corso, Martínez Cuevas, & Bañuelos Capuchino, 2009; Reyes Guevara and Rueda Beltrán, 2010; Montero Rojas, Rojas-Rojas, Negrín-Hernández and Francis Salazar, 2015).

In addition to the analysis this article poses on the prediction of academic success and how this is related to the student's performance in junior high education, it also intends to review the behavior of public and private institutions during the admission exam to high education institutions.

1.1 Standardized tests and the dilemma of their validity

In terms of effectiveness, assessment should be a tool that would allow diagnosis of functionality for the academic and administrative processes of educational institutions. Even when this is a narrow view, this type of process makes the control method clear which imposes an authoritarian status and fulfills a function that is more administrative than academic (González Pérez, 2001). In most of the cases, it does not take into account indicators, nor referents, that might provide insight into the student's perspective (Capote & Sosa, 2006; Reyes Guevara & Rueda Beltrán, 2010).

It is necessary to consider the following views regarding standardized tests that are used to select students:

- (1) The student must be prepared to modify certain former and somehow desynchronized patterns. An assessment of this kind has ultimately a self-forming function (Gimeno Sacristán, 1991; Pereyra, Kotthoff, & Cowen, 2013).
- (2) Assessment is characterized by the description of patterns that make weaknesses and strengths visible in a particular time and space frame in order for the individuals to face new situations (Márquez, 2004).
- (3) The demands imposed by new reforms to programs must show correlation with the features of the methods of evaluation in the previous school cycles these students face. Therefore, the results must present evidence of the program objectives and of the standardized test in the selection process (Chaves, Castillo, & Gamboa, 2008; Díaz-Barriga Arceo, 2012).
- (4) This type of exam should be conceptually aimed at the theoretical case for which they are developed for the real conditions of the generation that is being evaluated (Díaz-Barriga, 2006; González Barbera, Caso Niebla, Díaz López, & López Ortega, 2012).
- (5) National and international assessment tests analyze, in addition to the content and main items of the program, the efforts to achieve a successful transfer of knowledge and acquired behaviors (SEP, 2013). The modern tendency of this mass testing is to measure multiple variables in different implementation scenarios.
- (6) Although standardized tests regularly indicate the ranking of students in regards to a large ratio, they actually become

an individual diagnosis of skills in novel situations (Bringas Benavides, & Pérez Mejía, 2014).

- (7) The type of options included in the verbal and Spanish reasoning skills explore whether the student has developed a reading skill to complete specific activities in long texts such as articles, or discontinuous texts such as charts, tables, etc. (González Barbera, Caso Niebla, Díaz López y López Ortega, 2012). In regards to mathematics and logical-mathematical reasoning skills, the ability the student has to effectively reason and communicate ideas by outlining, formulating, solving and interpreting mathematical problems in different situations is analyzed (OCDE, 2004).
- (8) In Mexico, it is considered that massive assessment for the purpose of admission and selection is in the process of ongoing improvement, even when necessary feedback on results is rarely shown. It is necessary to consider that these types of measurement processes represent the trend in the assessment of students' careers (Laia & Zabala, 2008).

1.2 Approach to the problem

Basic education is defined as the system that is offered by the government free of charge and mandatory to all citizens, and is characterized by its availability, accessibility and adaptability. In Mexico as from 2013, according to the education sector programme 2013-2018 (SEGOB, 2013), higher education will be integrated into basic education, which was previously formed of preschool, elementary, and secondary school.

Nowadays, education infrastructure conditions in Mexico are not suited to accepting all applicants, therefore, selection tests are called upon.

Considering this, the approach to the problem for this research is based on the following factors:

- (1) It is unavoidably necessary to consider the application of selection tests due to the limited number of available seats in the educational centers. These models are developed in other countries and the proposals do not match the national educational reality. The countries Mexico took as reference for creating selection exams included Chile, Spain, Finland and Australia, to mention only the main ones. National newspaper *the Economist* analyses this issue in an article called *Finni-shed* (2013) in which experiences related to the selection of students are described, and indicate that these kind of evaluations can only measure individual competitiveness rather than institutional competitiveness. There is a theoretical assumption that the establishment of quality standards to measure competitiveness of institutions belongs solely to private schools, however, public schools should not be excluded from showing global academic behaviors in the analysis of specific data which identifies the academic success of these institutions. It is essential to form a culture that commonly perceives the educational system as a value chain, one in which each previous academic level determines the behavior of the subsequent one.
- (2) There is an extensive theoretical framework on assessment of the behavior of higher education selection tests, which are almost all predictive in design and include non-repre-

sentative samples. In contrast, there is little evidence of similar research that combines higher education and the behavior of basic education in secondary levels (this topic has been widely studied by Backhoff, Tirado, & Larrazolo, 2001; Chain, Cruz Ramírez, Martínez Morales, & Jácome, 2003; Gallardo Rayo, Álvarez Aguirre, & Rojas Gorigoytia, 2003; Cortés Flores, & Palomar Lever, 2008; De Anda Padilla, & López Olmos, 2010).

1.3 Objectives of the research

The cornerstone of the research for this article proposes to identify the level of institutional competitiveness of secondary schools in the state of Chihuahua, Mexico, by observing the results of the mass selection test for candidates for higher education. The following was considered in doing so: (i) the correlation between selection test results and grade point average in the secondary school; (ii) institutional competence levels in public and private schools; (iii) competence comparison by considering logical-mathematical and verbal reasoning, and Spanish and mathematics; (iv) index indicator assessment by considering secondary schools that might have provided more significant density of candidates that surpassed the general arithmetic mean; and (v) perspectives of teachers and directors from schools that showed high institutional competitiveness on the elements that contributed to obtaining favorable results.

2 DESCRIPTION OF THE COLLECTION AND DATA ANALYSIS PROCESS

The collection and data analysis process initially started as a stage to identify the information obtained from the results of candidates from 355 secondary schools, during the 2016 selection test EXANI-I (all of this processed in SPSS) by considering the following variables of the origin school and the results expressed in indexes and grades from the admission exam: system (public or private), type (general, technical, telesecondary, open, for adults, workers, part of Acuerdo 286).

From the collected data, a statistical analysis was done. This analysis was descriptive and about the behavior of the complete population. Afterwards, specific data was analyzed by considering the logical-mathematical and verbal reasoning indicators, and Spanish and mathematics indicators.

The final stage involved a statistical trim, and by doing so the analysis focused on those secondary schools that might have provided at least 180 candidates to the higher education institution in which the research was carried out, and whose results surpassed the general statistical means. This was the main reason for considering such institutions within the ratio of institutional competitiveness.

The research is centered on the analysis of results from the National Exam for the admission to Higher Education Institutions (EXANI-I) provided by the National Center of Evaluation for Education (CENEVAL), which is the official selection exam for secondary school students who aim to be admitted to higher education institutions. The purpose of this exam is to accurately assess the academic level of the students regarding what they know and how they use what they know; in other words, what skills they have (González Corso, Martínez Cuevas, Marín Oropeza, & Bañuelos Capuchino, 2009). It should be emphasized that the constructivist theory is taken as the foundation for this competence-based approach (Ortiz Cárdenas, 2003; Cázares, 2007), which means that the student should learn to be thorough, to de-

velop memory skills and reasoning and to use his imagination and physical skills (Delors, 2008).

Additionally, it is very important to explain the different elements of the EXANI-I Evaluation (CENEVAL, 2013; Martínez Pineda and Herrera Ortiz, 2014), mainly considering that:

- (1) The exam indicates the CENEVAL Index, also known as ICNE, on a spatial scale.
- (2) The results from the test range from 700 points (the lowest grade) to 1300 points (highest grade); the technical mean is 1000 points, which represents a score of 50% in terms of correct answers.
- (3) The exam is made up of 80 questions designed so most of the candidates should answer 50% of the questions correctly, which would represent 1000 points in the ICNE or CENEVAL index.
- (4) The scores of the candidates accumulate around the center, and a gradual reduction in the number of candidates that approach very high or very low grades is seen.
- (5) The results are expressed in relation to the ICNE or CENEVAL index scores, and these have been converted to percentages to ease the analysis.
- (6) The exam is structured into two skill areas: verbal reasoning—which measures the range of vocabulary by including questions of synonyms, antonyms, analogies, and the meaning of sentences and texts—and logical-mathematical reasoning—which evaluates numeric sequences and reasoning problems, in addition to assessing the ability to understand the visual world of objects, forms, spatial series and spatial imagination. It also includes the Spanish and Mathematics areas, both of which refer to curricular knowledge.

3 ANALYSIS OF RESULTS

This research considers as its main focus the results obtained from CENEVAL's selection exam EXANI-I presented in Colegio de Bachilleres (COBACH) in the state of Chihuahua for admission to the cohort class of 2016. This included 15,658 secondary school students, comprising 54.8% female and 45.2% male candidates from high school institutions.

The selection of this institution was done by observing that: (i) it is a public institution, located in the main urban areas of the state of Chihuahua, Mexico (with student registration of 54,000); (ii) it has a strong social influence and is considered the most accepted and selected institution by secondary school students and parents, and as the main education option to continue high school courses; and (iii) it offers a bivalent general high school curriculum that includes general and training courses for work activity, and which would be more favorable for later admission to any scientific field in higher education institutions.

3.1 Overall Results

According to data collection, 94.8% of students come from public sending secondary schools, and only 5.2% come from private schools. These schools are classified as follows: (i) general secondary (55.4%), (ii) technical secondary (42.5%); (iii) telesecondary (distance learning) (0.8%); (iv) open secondary (1.3%). The following systems of secondary schools did not provide data since these students are over the legal age, and by law high school institutions only admit candidates from regular sending secondary

schools: these systems of schools are for adults or the National Institute for Adult Education (INEA), for workers and the Acuerdo 286 (Agreement modifying the decree number 286).

In addition to including the total for the participant population and to avoid bias in the data analysis, the distribution of the candidate grades was identified with no samples according to educational regulation from the lowest grade of 6 and the highest grade of 10. A normal distribution was observed in the score levels (Figure 1) which indicates that the statistical distribution includes all performance levels without excluding any participants by means of high or low grades.

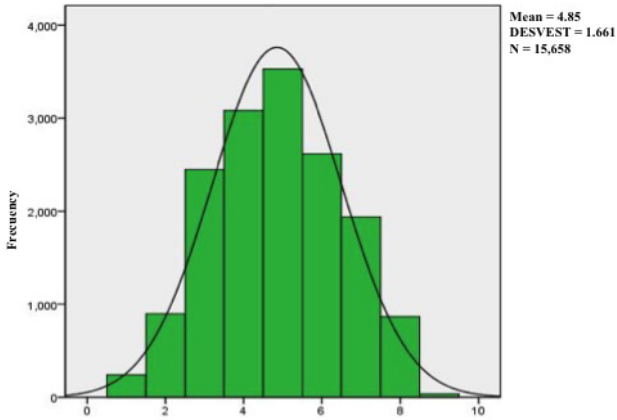


Figure 1. Average score levels in secondary schools

By correlating previous results with the score levels these candidates obtained in their secondary preparation, it was possible to observe normal statistical levels in the study group.

The statistical distribution observed in the candidates for the admission exam will be analyzed in the following section, first in an overall manner, and then by selecting each element that was assessed (logical-mathematical reasoning, verbal reasoning, and Mathematics and Spanish) and, by doing this, prove that the normal statistical distribution is constant in the previous academic settings and the results of the admission test from the study group.

In the same way, and to avoid information being biased, Figure 2 shows that the normal statistical distribution is preserved in the way the results vary according to the overall results obtained from the selection exam for all candidates of the study group and the percentage grades of the correct answers.

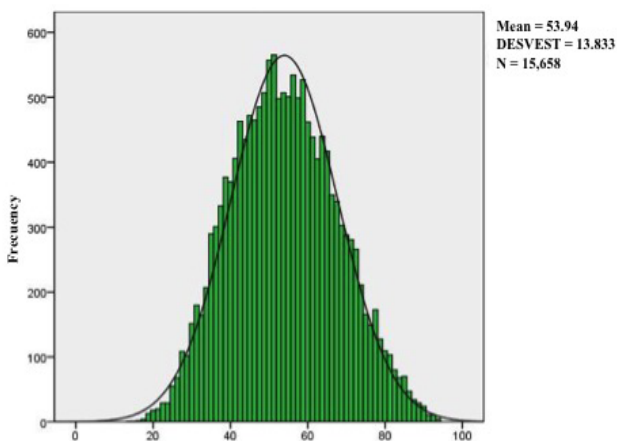


Figure 2. Admission test - correct answers percentage grade

A normal distribution was observed in the total for candidates of the study group in relation to the results from the selection exam, the distribution of each item evaluated (logical-mathematical reasoning, verbal reasoning, Mathematics and Spanish), and the percentage grades of correct answers. These results are shown in Figure 3.

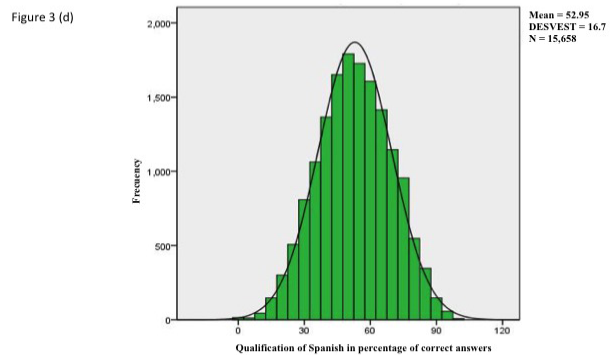
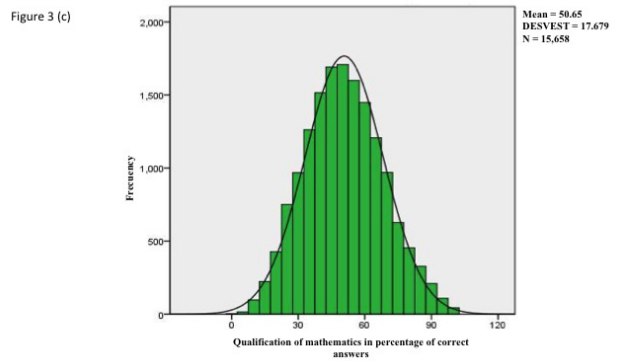
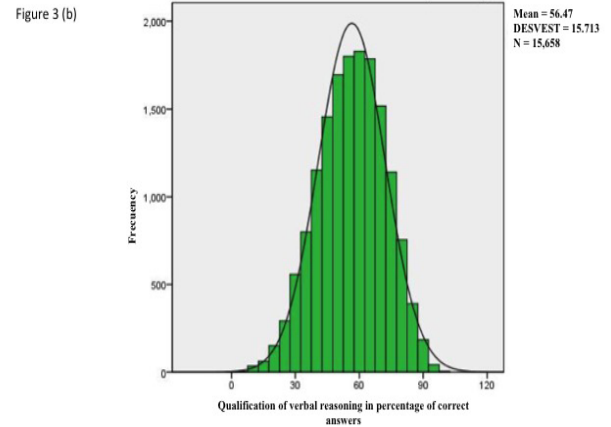
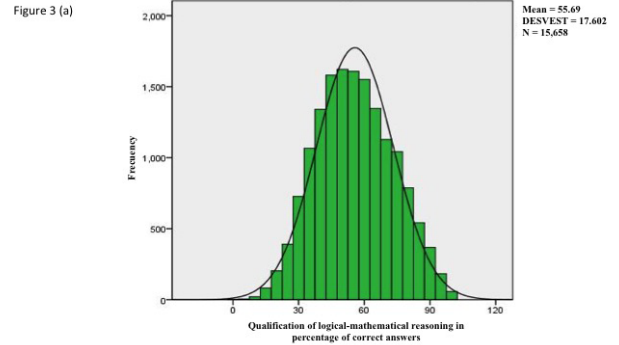


Figure 3. Results distribution of evaluated items - correct answers percentage grade

These previously described results prove that academic performance in secondary schools, which is seen in each of the student’s grade levels, is directly related to the performance in the admission test.

There is a specific criticism of different competitiveness research studies in different populations concerning admission exams that provided manipulated samples. These commonly cause biased results for distinctly featured subjects, therefore the resulting statistical distribution is not normal and the results fail to be representative of all candidates. Concerning the development of our research, the evaluation of grades levels and correct answer percentages were assessed with no exclusions.

In addition, another indicator that was possible to assess by observing the study group’s overall results was the performance of the admission test candidates’ achieved ranking, information that was classified from the lowest to the highest score, and which helped identify the position of the highest and lowest correct answers and error frequency (Figure 4). This classification presents an overwhelming number of candidates with low levels of correct answers and a reduced number of candidates with high levels of correct answers.

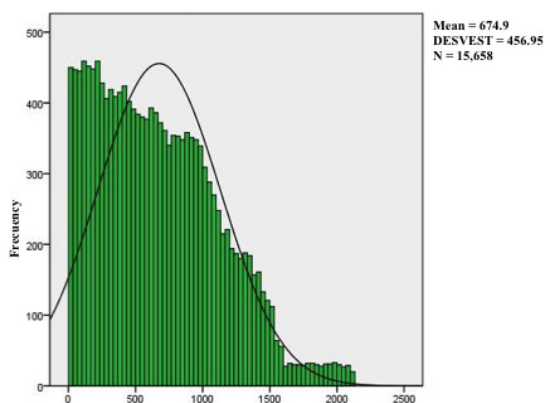


Figure 4. Admission Test Candidates’ Achieved Ranking

As a manner of summarizing the compilation of indicators that describe the candidates’ general conditions, the percentage of those who surpass the ICNE or CENEVAL’s Index was also studied. Figure 5 shows results surpassing the mean of 1000 points of this index, and the ratio of candidates who obtained scores below this indicator.

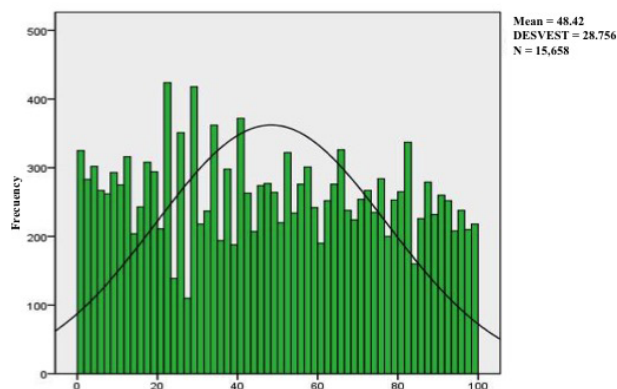


Figure 5. Percentage of candidates surpassing ICNE

3.2 Correlation of results from admission test and general point average

Factors that provide validity to the assessment by means of admission tests are usually questioned, with the argument that multiple elements related to the candidate can affect his/her performance (physical, pedagogical, psychological and sociological factors), thus causing unfavorable results, even if the academic performance of the previously completed level was high (Izar Landeta & López Gama, 2010).

To comply with the objectives of this research, an analysis of the correlation between candidates’ grade point average during secondary school and the scores obtained from the admission test was performed. This showed that there are positive results (correlation of 0.0403, considering that positive correlation is 0.01 [bilateral]), and that candidates with the best academic grades during secondary school obtained high scores in the admission exam EXANI-I (Table 1).

3.3 Comparative analysis of admission competitiveness by secondary school system (public and private)

Education is a transforming process that establishes high performance standards for teachers and students. Quality in education is a topic that is more related to a particular level of excellence than the origin of resources for academically and administrative-

Table 1. Correlation between second grade average vs. admission test results

		Secondary Grade Point Average	CENEVAL Index score in admission test
Secondary Grade Point Average	Correlation coefficient	1.000	.403**
	Sig. (bilateral)		.000
	N	15,658	15,658
CENEVAL Index score in admission test	Correlation coefficient	.403**	1.000
	Sig. (bilateral)	.000	
	N	15,658	15,658

ly managing an institution. Therefore, hypothetically, making a distinction between public and private education should not be relevant.

However, the collective worldview and that found in almost every country is that education somehow represents some aspects of the person's social status and that social status unavoidably determines their education's quality. Evidently, this puts those who educate the masses at a disadvantage compared to those who educate the social elite since the latter has more accessibility to elements that can benefit the educational process (McEwan & Carnoy, 2000; Bellei, 2007).

In the course of this research, fundamental data showed notable differences in percentages between private secondary schools and public schools, in terms of the number of candidates they present and the number of institutions that participate. This in turn causes private schools not to be listed as the most competitive institutions.

Therefore, it was considered relevant, and fair, to perform a comparison on the competitiveness levels of both educational systems. The results are listed below:

- (1) Grade point average comparison in secondary schools shows that the highest ranking was 8.5-8.9 for private schools; on the other hand, for public schools the highest was 8.0-8.4.
- (2) In regards to CENEVAL's ranking, private school system institutions obtained a mean of 499.97 in the general position, whereas public schools obtained a mean of 684.57. Candidates' scores accumulate in the middle and a gradual reduction of candidates is seen as they reach very high or very low scores. The previous process allows the comparison of results with the rest of the population that has been evaluated and, by doing so, identifies the position they occupy relative to the rest of the study group.
- (3) Average CENEVAL index or ICNE of the private secondary school system was 1,063.47, whereas in the public school system it was 1,021.71. This shows an approximate 60 point difference.
- (4) CENEVAL's percentile is a central tendency which indicates, once data has been arranged in descending order, that the private secondary schools have a 60.68 percentage whereas public secondary schools record a 51.08 percentage.
- (5) According to obtained data, admission test correct answer percentage grades show an arithmetic mean for correct answers of 60.54 in private schools, and 53.58 in public schools.
- (6) The comparison of item to evaluate in private and public secondary schools respectively show the following means: (i) logical-mathematical reasoning (arithmetic mean) 60.98 and 55.40; (ii) verbal reasoning (63.30 and 56.09); Mathematics (57.21 and 50.29); and (iv) Spanish (60.65 and 52.52).
- (7) The comparison of admission test grades in private and public secondary schools in terms of scores were shown, respectively: (i) logical-mathematical reasoning (1,065.89 and 1,032.39 points); (ii) verbal reasoning (1,079.83 and 1,038.80 points); Mathematics (1,043.24 and 1,003.93 points); and Spanish (1,015.15 and 1,063.88 points).

3.4 Competitiveness of Secondary schools according to the evaluated item

The general performance of participating secondary schools is presented in the following selection according to the four evaluated items of EXANI-I (logical-mathematical reasoning, verbal reasoning, Mathematics, Spanish) as an admission test for higher education institutions; only institutions above the general mean and providing more than 180 candidates were included.

Data is included in Tables 2, 3, 4 and 5 showing the differences in ranking of each secondary school depending on the item that was being evaluated. The names of the secondary schools match the names found in the research of the governmental catalogue of schools according to a particular code that students register in their admission test.

Table 2. Competitiveness of Secondary schools in logical-mathematical reasoning

School	Shool candidates	Mean	Desvest
1. Secundaria técnica 72	285	67,39	16,58
2. Secundaria técnica 2	354	65,38	17,44
3. Secundaria técnica 61	166	64,22	18
4. Secundaria estatal 3015 Sor Juana Inés de la Cruz	221	64,21	16,6
5. Secundaria general 1	395	61,76	17,77
6. Secundaria técnica 33	312	61,54	17,46
7. Secundaria estatal 3008 centro escolar Benito Juárez	259	61,06	16,97
8. Secundaria técnica 42	201	60,7	18,08
9. Secundaria general ES-23	162	59,81	17,21
10. Moisés Sáenz Garza	383	59,66	18,08
11. Secundaria técnica 57	168	59,2	17,5
12. Maria Curie	198	58,66	16,95
13. Secundaria estatal 3009 centro escolar Centenario	154	58,6	18,63
14. Secundaria técnica 64	352	58,57	16,4
15. Secundaria técnica 44	339	57,6	17
16. Secundaria estatal 3016	187	57,25	16,25

Table 3. Competitiveness of Secondary schools in verbal reasoning

School	Shool candidates	Mean	Desvest
1. Secundaria técnica 72	285	66,07	13,57
2. Secundaria técnica 2	354	65,06	14,18
3. Secundaria estatal 3015 sor Juana Inés de la Cruz	221	62,31	14,51
4. Secundaria estatal 3008 centro escolar Benito Juárez	259	61,91	15,64

5. Maria Curie	198	61,52	15,17	10. Secundaria general 1	395	57,3	16,07
6. Secundaria Técnica 33	312	61,22	15,38	11. Moisés Sáenz Garza	383	57,08	16,59
7. Secundaria general 1	395	61,15	15,72	12. Secundaria federal 5 Adolfo Barranco Fuentes	217	54,59	16,38
8. Moisés Sáenz Garza	383	60,25	15,51				
9. Secundaria estatal 3016	187	60,13	13,71				
10. Escuela secundaria federal núm. 11 Chihuahuenses Ilustres	283	59,29	14,56				
11. Secundaria tecnica 42	201	58,63	15,93				
12. Secundaria federal 5 Adolfo Barranco Fuentes	217	58,39	15,96				
13. Secundaria estatal 3002	244	57,21	15,67				

Table 4. Competitiveness of Secondary schools in Mathematics

School	Shool candidates	Mean	Desvest
1. Secundaria técnica 2	354	61,37	18,12
2. Secundaria estatal 3015 Sor Juana Inés de la Cruz	221	61,27	16,85
3. Secundaria técnica 72	285	60,79	17,26
4. Secundaria estatal 3008 centro escolar Benito Juárez	259	59,21	17,9
5. Secundaria técnica 42	201	57,96	17,74
6. MARIA CURIE	198	57,12	15,75
7. Moisés Sáenz Garza	383	57,05	18,6
8. Secundaria general 1	395	55,71	17,8
9. Escuela secundaria federal 11 Chihuahuenses Ilustres	283	55,48	17,79
10. Secundaria técnica 33	312	54,74	16,7

Table 5. Competitiveness of Secondary schools in Spanish

School	Shool candidates	Mean	Desvest
1. Secundaria técnica 72	285	63,6	15,63
2. Secundaria estatal 3008 centro escolar Benito Juárez	259	60,5	16,74
3. Secundaria técnica 2	354	60,23	15,47
4. Secundaria estatal 3015 Sor Juana Inés de la Cruz	221	59,68	15,33
5. Secundaria técnica 33	312	58,67	16,25
6. Maria Curie	198	58,64	17,26
7. Secundaria estatal 3016	187	58,21	15,48
8. Escuela secundaria federal 11 Chihuahuenses Ilustres	283	58,04	16,88
9. Secundaria técnica 42	201	57,94	15,88

3.5 Identification of Competitive Secondary schools from admission test scores

This section of the research analysis presents the percentage average of the previously described four evaluated items. This groups 24 secondary schools and an arithmetic mean of 55.33 points. From this result, 11 schools that are above the arithmetic mean were identified, and as such are henceforth identified as competitive secondary schools. They correspond to 3.28% of the total participant schools (Table 6).

Table 6. List of Highly Competitive Secondary Schools

School	Arithmetic mean
1. Secundaria técnica 72	64,46
2. Secundaria técnica 2	63,01
3. Secundaria estatal 3015 Sor Juana Inés de la Cruz	61,87
4. Secundaria estatal 3008 centro Escolar Benito Juárez	60,67
5. Secundaria técnica 33	59,04
6. Maria Curie	58,98
7. Secundaria general 1	58,98
8. Secundaria técnica 42	58,81
9. Moisés Sáez Garza	58,51
10. Escuela secundaria federal 11 Chihuahuenses Ilustres	57,41
11. Secundaria estatal 3016	56,31
12. Secundaria federal 5 Adolfo Barranco Fuentes	54,77
13. Secundaria técnica 44	54,51
14. Secundaria técnica 64	53,56
15. Secundaria estatal 3002	53,22
16. Batalla de sacramento	53,16
17. Guillermo Prado Prado	52,37
18. Secundaria general 16 ES-98	51,64
19. Secundaria técnica 60	51,27
20. Secundaria técnica 80	50,38
21. Secundaria técnica 88 complejo educativo Artemio de la Vega	50,18
22. Secundaria técnica 91	49,06
23. José Reyes Estrada	48,92
24. Secundaria Técnica 84	46,91

3.6 From the perspective of the participants, which factors promote institutional competitiveness?

Once the competitive secondary schools were identified, the research led us to look at the reasons that were considered factors in getting positive (or adverse) results in the admission test for higher education institutions. This was done by selecting focus groups (one per institution), using a participative qualitative approach.

In order of importance and according to information from collected data, factors that promote competitiveness in public secondary schools are the following:

- (1) Geographical location of the institution in low risk urban areas.
- (2) Socio-economic status indicated by parents' employment stability.
- (3) Cultural level of the student's family members, specifically meaning the last schooling level of the parents (at least high school level or incomplete college degree) and the extent to which they value education as a tool for progress.
- (4) Coming from functional families (father, mother and children household); this creates a better environment to expect higher academic results of teachers, and better attention is paid to children.
- (5) Infrastructure and educational equipment funded by parents' contributions; therefore, they have more resources such as electricity, drinking water, central heating, teaching material, computers, libraries, a department of counseling, a department of prefecture, assistance for disabled students, extracurricular activities, etc. - all this favors the management and functionality of the school and creates a harmonious environment.
- (6) Leadership and management skills from the administrators; an institutional vision that demands professional performance from the academic team and effective interaction with authorities and parents, all of which fosters collaborative work among professors as it limits the admission of troublesome teachers (those who are generally not admitted by other institutions), allows selection during the admission process (in terms of quality and number of students to be part of each class group), facilitates the finding of training sources for teachers.

Factors that are considered unfavorable to the students' performance throughout their secondary schooling, and that are reflected later on in their future academic activities are: (i) lack of availability from parents; (ii) students' personal attitude and motivation lacking initiative; (iii) low self-esteem; (iv) loss of family values; and (v) strong influence of gangs and violent environment.

4 FINAL ARGUMENTS AND CONCLUSIONS

Institutional competitiveness seems to be more of an industrial term, a concept that sways back and forth between different productivity-linked scenarios through observing the value of the generated product by means of systematic work, and then taking into account profitable efficiency.

Regarding educational institutions, competitiveness becomes very relative, especially when it comes to valuing the product by means of specific indicators in which multiple factors that cannot be controlled intervene and affect the success of the person

that is being educated. These factors might be demographic elements, economic and social conditions and, above all, individual and collective expectations indicating confidence towards school institutions and how the social responsibility they face is acknowledged.

Measurement of institutional competitiveness will never be thorough in an educational institution since it can be affected by multiple nuances that are rarely significant of the current educational state.

The educational institution is influenced by elements of the setting, long-term perspectives that cause the insertion of the subject into other educational or occupational environments, usage of financial resources, levels of training for teachers, definition of processes and their results, and features of the type of teaching offered.

Contrary to the practices of public scientific research on admission tests - theoretical frames in which results arise from selected samples - this analysis includes the total population of a generational cohort, which allowed objectivity in results during the identification process of competitive secondary schools.

Previous collected data from the grade's average and admission test results was correlated by comparing the performance of private and public secondary schools and two results were seen: (i) the vast majority of the school population is covered by the public sector; and (ii) since private secondary schools provided the bare minimum of the student population, and given the analytical model that was used, these schools should have had almost no possibility of being identified as competitive, nevertheless, the students from this type of schools proved to have better results in every evaluated academic indicator, both previously and during the admission test in comparison to those from public secondary schools.

The identification of competitive secondary schools not only showed consistent performance in the four evaluated indicator sequences, but also demonstrated another relevant factor: these can be described as public secondary schools, located in urban areas of high social risk. The total of schools identified according to the type of evaluated indicator were: (i) logical-mathematical reasoning (16); (ii) verbal reasoning (13); (iii) mathematics (10); and (iv) Spanish (12), but mostly coinciding in all, and adding a total of 24 secondary schools that were institutionally represented in at least two indicators. The final list of competitive schools included 11 entities, seemingly a low number given the ratio of participating secondary schools in this admission test process.

Finally, since the research only provided strong data that identified institutional competence by means of numeric indicators, the qualitative data collection section for teachers and school administrators of highly competitive schools offers elements of a more social contribution that are linked to the students' social environment and the school setting, which is regularly out of the school institution's reach.

These elements emphasize a socio-demographic aspect that is related in a lesser way to academic matters, therefore the high education system in Mexico will experience, in the short term, a crisis in terms of withdrawal, graduation efficiency rate, and academic performance unless intervention strategies to face the greatest educational challenges of the XXI century are designed.

REFERENCES

- Álvarez, J., Aguilar Parra, J. M., Fernández, J. M., Salguero, D., & Pérez-Gallardo, E. R. (2013). El estrés ante los exámenes en los estudiantes universitarios: propuesta de intervención. *International Journal of Developmental and Educational Psychology*, 2(1), 179-187.

- Backhoff, E., Tirado, F., & Larrazolo, N. (2001). Ponderación diferencial de reactivos para mejorar la validez de una prueba de ingreso a la universidad. *Revista Electrónica de Investigación Educativa*, 3(1), 21-31.
- Bellei, C. (2007). Expansión de la educación privada y mejoramiento de la educación en Chile: evaluación a partir de evidencias. *Revista Pensamiento Educativo*, 40(1), 285-311.
- Bringas-Benavides, M., & Pérez-Mejía, J. (2014). El examen de ingreso al nivel superior: ¿admisión o decepción? *Ra Ximhai*, 10(5), 103-114.
- Capote, S., & Sosa, A. (2006). *Evaluación: rúbrica y listas de control*.
- Cárdenas, A. (2012). Poder discriminativo y nivel de exigencia de los exámenes de selección. *Horizonte en la Ciencia*, 3(3), 73-81.
- Cázares, R. (2007). El enfoque de competencias y el currículum del bachillerato en México. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud*, 8(1), 481-508.
- Centro Nacional de Evaluación para la Educación Superior (2013). *Guía del Examen Nacional de Ingreso a la Educación Media Superior (EXANI-I)* (20ª ed.). México, D. F.: CENEVAL.
- Chain, R., Cruz, N., Martínez, M., & Jácome, N. (2003). Examen de selección y probabilidades de éxito escolar en estudios superiores. Estudio en una universidad pública estatal mexicana. *Revista Electrónica de Investigación Educativa*, 5(1), 1-17.
- Chaves, E., Castillo, M., & Gamboa, R. (2008). Correlación entre el examen de admisión y el rendimiento en el primer año de la carrera Enseñanza de la Matemática en la UNA. *Revista Educare*, XII(2), 65-80.
- Cliff, A., & Montero, E. (2010). El balance entre excelencia y equidad en pruebas de admisión: contribuciones de experiencias en Sudáfrica y Costa Rica. *Revista Iberoamericana de Evaluación Educativa*, 3(2), 7-28.
- Cortés, A., Palomar, J. (2008). El proceso de admisión como predictor del rendimiento académico en la Educación Superior. *Universitas Psychologica*, 7(1), 197-213.
- De Anda, H., & López, R. (2010). Predictibilidad de los exámenes de conocimientos para ingresar a las preparatorias de la Universidad De La Salle Bajío. *Nova Scientia*, 2(4), 169-190. doi:10.21640/ns.v2i4.217
- Delors, J. (2008). *La Educación encierra un tesoro*. Nueva York, NY: UNESCO.
- Díaz-Barriga, Á. (2006). Las pruebas masivas: Análisis de sus diferencias técnicas. *Revista Mexicana de Investigación Educativa*, 11(29), 583-614.
- Díaz-Barriga, F. (2012). Reformas curriculares y cambio sistémico: una articulación ausente pero necesaria para la innovación. *Revista Iberoamericana de Educación Superior*, 1(7), 23-40.
- Finn-ished (2013). *The Economist Newspaper*. Retrieved from <http://www.economist.com/news/international/21591195-fall-former-nordic-education-star-lat-est-pisa-tests-focusing-interest>
- Gallardo, I., Álvarez, Y., & Rojas, M. (2003). Estudio de validez predictiva del examen especial de admisión a la carrera de psicología. *Revista de Psicología de la Universidad de Chile*, 12(1), 65-81.
- García-Castro, G., & Bartolucci, J. (2007). Aspiraciones educativas y logro académico: un estudio de caso sobre características y condiciones sociales de los estudiantes de la UAM. *Revista Mexicana de Investigación Educativa*, 12(35), 1267-1288.
- Gimeno, J. (1991). *El currículum, una reflexión sobre la práctica*. Madrid: Ediciones Morata.
- González, F. L. (2000). Lo cualitativo y lo cuantitativo en la investigación de la psicología social. *Revista Cubana de Psicología*, 17(1), 61-71.
- González, M. (2001). La evaluación del aprendizaje: tendencias y reflexión crítica. *Revista Cubana de Educación Media Superior*, 15(1), 85-96.
- González, C., Caso, J., Díaz, K., & López, M. (2012). Rendimiento académico y factores asociados. Aportaciones de algunas evaluaciones a gran escala. *Bordón*, 64(2), 51-68.
- González, J. U., Hernández, C., & López, D. (2011). Control de admisión multicast. *Tectura*, 15(29), 42-53.
- González, E., Martínez, P., Marín, D. I., & Bañuelos, J. R. (2009). *Red curricular: una herramienta para el diseño de instrumentos de evaluación*. México, D. F.: CENEVAL.
- Izar, J. M., & López, H. (2010). El puntaje que obtienen los estudiantes de contaduría pública en el examen general de egreso de la licenciatura (EGEL) y su relación con el promedio obtenido durante su carrera. *Hitos de Ciencias Económico Administrativas*, 16(44), 27-34.
- Laia, L., & Zabala, A. (2008). *11 Ideas clave: cómo aprender y enseñar competencias*. Retrieved from http://moodle2.unid.edu.mx/dts_cursos_md/lic/ED/DC/AM/12/Evaluar_competencias_es_evaluar_procesos.pdf
- Márquez, J. A. (2004). Calidad en la educación superior en México. ¿Es posible un sistema eficaz, eficiente y equitativo? Las políticas de financiamiento de la Educación Superior en los noventa. *Revista Mexicana de Investigación Educativa*, 9(21), 447-500.
- Martínez, J. A., & Herrera, M. (2014). Propiedades psicométricas de la escala de cómputo para EXANI-II. *REDIE: Revista Electrónica de Investigación Educativa*, 16(2), 68-80.
- McEwan, P., & Carnoy, M. (2000). The Effectiveness and efficiency of Private Schools in Chile's Coucher System. *Educational Evaluation and Policy Analysis*, 22(3), 213-239. doi:10.3102/01623737022003213
- Montero, E., Rojas-Rojas, G., Negrín-Hernández, M., & Francis, S. (2015). Efecto de una capacitación sobre los puntajes de la prueba de admisión de la Universidad de Costa Rica: una aproximación bayesiana. *Actualidades en Psicología*, 29(119), 115-130. doi:10.15517/ap.v29i119.19283
- Mora, A. I. (2004). La evaluación educativa: Concepto, periodos y modelos. *Revista Electrónica Actualidades Investigativas en Educación*, 4(2).
- Organización para la Cooperación y el Desarrollo Económico – OCDE. (2004). *Proyecto PISA, la medida de los conocimientos y destrezas de los alumnos: un nuevo marco de evaluación*. Madrid: Ministerio de Educación, Cultura y Deporte, INCE.
- Ortiz, J. (2003). Gestión Universitaria, racionalidad y trayectorias escolares. *Reencuentro*, 36, 44-55.
- Pereyra, M. A., Kothhoff, H. G., & Cowen, R. (2013). La experiencia del PISA en Alemania: recepción, reformas recientes y reflexiones sobre un sistema educativo en cambio. *Profesorado: Revista de Currículum y Formación del Profesorado*, 17(2), 6-14.
- Reyes, P. M., & Rueda, M. (2010). Los procesos y pruebas de admisión en la Educación Superior. *Revista Iberoamericana de Evaluación Educativa*, 3(2), 4-6.
- Secretaría de Educación Pública (2013). *La evaluación en la escuela*. México, D.F.: SEP.
- Secretaría de Gobernación (2013). *Programa Sectorial de Educación, 2013-2018*. México. Retrieved from http://www.dof.gob.mx/nota_detalle.php
- Torres, L. (2012). *Incidencias de la admisión de estudiantes con bajos puntajes en las pruebas de estado en la deserción universitaria: caso Universidad Santo Tomás, Sección Bucaramanga* (Doctoral dissertation). Universidad de Granada, Granada.
- Villardón, L. (2006). Evaluación del Aprendizaje para promover el desarrollo de competencias. *Educatio Siglo XXI*, 24, 57-76.

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