

<https://doi.org/10.23913/ride.v10i20.597>

Artículos Científicos

**Proceso de rendimiento académico con la identidad
universitaria en argentinos, peruanos, mexicanos y
costarricenses considerando factores de la neurociencia**

*Process of Academic Performance with University Identify in Argentineans,
Peruvians, Mexicans and Costa Ricants Considering Factors of Neuroscience*

*Processo de desempenho acadêmico com identidade universitária em
argentinos, peruanos, mexicanos e costarriquenhos considerando fatores
neurocientíficos*

Joel Luis Jiménez Galán

Universidad Autónoma de Tamaulipas, México

jjimenez@docentes.uat.edu.mx

<https://orcid.org/0000-0001-9490-0824>

Patricia Lorelei Mendoza Roaf

Universidad de Guadalajara, México

patricia.mendoza@cucs.udg.mx

<https://orcid.org/0000-0002-3047-283X>

Jorge Alberto Aimaretti

Universidad Nacional de Rosario, Argentina

jorgeaimaretti@gmail.com

<https://orcid.org/0000-0002-5406-9383>

Pedro Flores Peña

Universidad Nacional Mayor de San Marcos, Perú

pfp.flores@gmail.com

<https://orcid.org/0000-0001-5110-2099>

Miguel Ángel Montalvo Vivanco

Universidad Autónoma de Aguascalientes, México

miguel.montalvo@edu.uaa.mx

<https://orcid.org/0000-0002-2536-3882>



Oscar Mena Redondo

Universidad de Costa Rica, Costa Rica

oscar.mena1958@gmail.com

<https://orcid.org/0000-0002-4352-8919>

Resumen

Como resultado del rendimiento académico que mantuvieron estudiantes de algunas universidades y su factor de riesgo hacia la ansiedad, se consideró la neurociencia en este trabajo de investigación. El objetivo fue identificar el rendimiento académico y los factores y habilidades pedagógicas bajo la identidad étnica universitaria de argentinos, peruanos, costarricenses y mexicanos y su relación con la ansiedad. Se analizó un total de 150 instrumentos y un universo de 1500 estudiantes mediante un diseño observacional multicéntrico, y fueron aplicados dos instrumentos de medición en la escalas de Medmar y de ansiedad de Hamilton, realizados bajo diferentes ambientes escolares de seis universidades latinoamericanas en el periodo 2018-2019. Los indicadores estadísticos sirvieron para medir las variables independientes y dependientes, tal y como morbilidad y afectivo emocional. Entre los principales datos se encontró que las habilidades pedagógicas y psicosociales respecto al rendimiento académico deben considerarse como algo integral. Además, un total de 90 % de los alumnos encuestados mostró un comportamiento de grupo casi normal, mientras que se detectó que 10 % de los alumnos manifestaban trastornos del estado de ánimo o trastornos del habla. Se concluye que las variables sobre el rendimiento académico, factores y habilidades psicosociales afectan las situaciones de aprovechamiento académico en su interacción con los programas académicos participantes, al manejarse un parámetro desde una leve hasta grave ansiedad, lo cual se demostró con los datos de consistencia interna, fiabilidad test-retest y validez concurrentes sustentada en la neuroeducación.

Palabras clave: comportamiento de grupo, habilidad pedagógica, identidad étnica, trastornos del habla.

Abstract

As a result of the academic performance maintained by students of some universities and their risk factor towards anxiety, neuroscience was considered in this research work. The objective was to identify the academic performance and the pedagogical factors and abilities under the university ethnic identity of Argentines, Peruvians, Costa Ricans and Mexicans and their relationship with anxiety. A total of 150 instruments and a universe of 1500 students were analyzed using a multicenter observational design, and two measuring instruments were applied on the Medmar and Hamilton anxiety scales, performed under different school environments of six Latin American universities in the 2018-2019 period. Statistical indicators were used to measure independent and dependent variables such as morbidity and emotional affective. Among the main data it was found that pedagogical and psychosocial skills regarding academic performance should be considered as integral. In addition, a total of 90% of the students surveyed showed almost normal group behavior, while it was found that 10% of the students manifested mood disorders or speech disorders. It is concluded that the variables on academic performance, factors and psychosocial skills affect situations of academic achievement in their interaction with the participating academic programs, when handling a parameter from mild to severe anxiety, which was demonstrated with internal consistency data, test-retest reliability and concurrent validity sustained in neuroeducation.

Keywords: group behavior, pedagogical ability, ethnic identity, speech disorders.

Resumo

Como resultado do desempenho acadêmico mantido por estudantes de algumas universidades e seu fator de risco para a ansiedade, a neurociência foi considerada neste trabalho de pesquisa. O objetivo foi identificar o desempenho acadêmico e os fatores e habilidades pedagógicas da identidade étnica universitária de argentinos, peruanos, costarriquenhos e mexicanos e sua relação com a ansiedade. Foram analisados 150 instrumentos e um universo de 1500 alunos, utilizando um desenho observacional multicêntrico, e dois instrumentos de medição foram aplicados nas escalas de ansiedade Medmar e Hamilton, realizadas em diferentes ambientes escolares de seis universidades latino-americanas no período de 2018-2019. Indicadores estatísticos foram utilizados para medir variáveis independentes e

dependentes, como morbidade e afeto emocional. Dentre os principais dados, verificou-se que as habilidades pedagógicas e psicossociais em relação ao desempenho acadêmico devem ser consideradas como integrais. Além disso, um total de 90% dos estudantes pesquisados mostrou comportamento de grupo quase normal, enquanto verificou-se que 10% dos estudantes manifestaram distúrbios de humor ou de fala. Conclui-se que as variáveis desempenho acadêmico, fatores e habilidades psicossociais afetam situações de desempenho acadêmico na interação com os programas acadêmicos participantes, ao lidar com um parâmetro de ansiedade leve a grave, o que foi demonstrado com dados de consistência interna, confiabilidade teste-reteste e validade concorrente sustentadas na neuroeducação.

Palavras-chave: comportamento em grupo, capacidade pedagógica, identidade étnica, distúrbios da fala.

Fecha Recepción: Abril 2019

Fecha Aceptación: Diciembre 2019

Introduction

The Latin American and Caribbean region currently shows a large deficit in achieving a confluence that leads to cooperative courses of action on the major issues of the global and regional agenda (Caetano, 2015). The intense situation of public universities in relation to academic performance for five years, characterized by uncertainty, the psychosocial factor in education and cognitive levels has shown low or not enough, medium or regular and very few good or excellent levels of approval by students. This is due to risk factors such as family, human profile, school profile, school environment and educational responsibility, linked to the symptoms and health conditions of the student.

Waiting for some qualification result or living difficult situations before arriving at school and that are of family discomfort, be it violence, authoritarianism, paternalism or lack of financial support, are reasons for anxiety, which can be classified as very serious or disabling, severe, moderate, mild or absent.

“According to the national survey conducted by the Peruvian Ministry of Education, there is a worrying increase in the occurrence of harassment problems. This situation can be

summed up in the following figures: 1) 54% of schoolchildren interviewed at national level, between 2007 and 2010, declared having suffered various aggressions; 2) 91% said nicknames were the most frequent type of aggression; 3) 36.5% accepted the so-called law or code of silence in class; 4) 64% of classmates witnessed these attacks but chose not to defend the assaulted; 5) the teachers refrained from intervening in 34.2% of the violent acts they witnessed, and 6) only 13.6% of the victims told their parents what was happening, and 30% of these parents did not give it due importance.”. (Castro,2011).

In the American Declaration of the rights and duties of man (Inter-American Commission on Human Rights, 1948) where Peru was present, it is mentioned in Article 13 - Right to the benefits of culture is mentioned, among other things, “every person has the right to participate in the cultural life of the community, enjoy the arts and enjoy the benefits that result from intellectual progress and especially scientific discoveries ”(chapter. I). On the other hand, in Mexico, Article 3 of the Political Constitution of the United Mexican States (Official Gazette of the Federation [DOF], 1917) states that “the education provided by the State will tend to develop harmoniously all the faculties of the human being and it will foster in him, at the same time, the love of the country, the respect for human rights and the awareness of international solidarity, in independence and in justice ”. Likewise in Argentina, the following is considered or mentioned, “The school was responsible, together with the family for a successful socialization, distributing the credentials necessary to establish an integrated adult life; while crime was one of the residual options for those who. Among other setbacks, they were excluded or little favored by the education system ”(Kessler, 2004).

While in the National Council of Rectors (Conare, 2013). Compendium of Laws, Decrees and Agreements of the State University Higher Education in Costa Rica and the Political Constitution of Costa Rica of 1949 with reforms until 2013, in its articles 77 and 78, the following is mentioned:

Public education will be organized as an integral process correlated in its various cycles, from preschool to university (...). In state education, including higher education, the expenditure shall not be less than six percent (6%) per year of the gross domestic product, in accordance with the law, without prejudice to the provisions of articles 84 and 85 of this constitution.

On the other hand, Abarca and Sánchez (2005) found that defectors have little knowledge about the careers in which they are enrolled. In addition, they do not have entry to the desired career, a factor that stimulates the abandonment of the university. It is also reported that the economic factor is not decisive for attrition and that students who leave the institution are not by the university system, since they are incorporated into other options in higher education.

Returning to Mexico and according to article 3 of the aforementioned Mexican constitution:

Everyone has the right to receive education. The State - Federation, States, Mexico City and Municipalities - will provide and guarantee initial, preschool, primary, secondary, upper and higher education. Initial, preschool, primary and secondary education make up basic education; this and the higher average will be mandatory "Paragraph reformed DOF 12-11-2002 y 09-02-2012.

According to the report published by the Organization for Economic Cooperation and Development (OECD 2016), PISA 2015. Key results, among 15-year-old students, there is a level of satisfaction with life of 8.3 on a scale of 0 to 10 (average of OECD). Added to this, following this same source, a level of performance motivation above the OECD average: 83% stated that they want to be the best, whatever they do, and 96% are motivated to get the highest marks in all or in almost all subjects. With these data, it was possible to show whether or not there is progress in Latin America and within a universal coverage among all participating universities.

In this work, a finite sample of 4.5% of the size of the universe was taken, namely 1500 random sampling students, based on the finite formula.

As:

N = Total population;

$Z\alpha$ = 1.96 squared (if the reliability is of 95 %);

p = expected proportion (in this case 5 % = 0.05);

q = $1 - p$ (in this case $1 - 0.05 = 0.95$), and



d = precision.

According to the sample obtained, using the formula for the finite population, a sample size equivalent to 70 questionnaires was obtained.

The Likert scale was used for the instruments as a measurement tool that, unlike dichotomous questions with yes or no answer, allows measuring attitudes and knowing the degree of compliance of the respondent, by establishing in the instruments a certain scale as the reference for each of the items considered, according to the independent and dependent variables used.

coverage "at the level", that is, part of the population that accesses an educational service of the expected level given their age, which is usually known as the net enrollment rate; and coverage "in grade" or "timely," a fraction of the population served at the level and grade expected according to age. In no case are the "gross enrollment ratios" used, since in these the numerator is not a subset of the denominator, so it does not measure a proportion - and coverage is a proportion - but volume in relative terms. (Guadalupe 2002 and 2015).

Keep in mind that coverage is computed using (in the numerator) enrollment information and (in the denominator) population estimates. Thus, for example, if population estimates are overestimated, this may lead to an underestimation of coverage. Similarly, the discrepancy between the sources can generate estimation errors that are evident - but are not limited to - when rates exceed 100%.

For example, in Peru, Otárola (1999) in his comparative work with the UAEH, rescues from the Peruvian constitution of 1993 The following quotation:

On this point, Canales (2006: P5) cites what he mentions in terms of ANUIES coverage where he recognizes that one of the most important challenges is the development of infrastructure to respond to the growing demand at the level of secondary, upper secondary and higher education. higher. In round figures: seven out of ten young people who were of the age to pursue higher education were out of university classrooms. But, in addition, with great disparities by federative entities, for example: where it is perceived that the state of Hidalgo in the period presented has always been below the national average, except for 2014.

The aspirants of the National University of San Marcos, wanting to enter the Autonomous University of the State of Hidalgo (UAEH), in Mexico, had a better Pearson correlation with academic behavior and their ideal idea of the State Population Council with a range of young people whose ages were 15 to 29 years, through the Linear Regression, using the statistical software SPSS see 10.

Where an equation was applied to project the new applicants to 2030, which will show an accumulated growth of 5.94% and where the same National Population Council (CONAPO, 2012) projects it, by 2050, with a decrease of young people 18 years of age that will be 15.7%, if the Autonomous University of the State of Hidalgo maintains its growth equal to the previous period of 2011 TO 87% in 2016 (UAEHa: 26) that was 6% per year, it can be passed from a coverage of 34% in 2017 to one of 45.9% and in 2019 100% of students from the secondary level to the middle level will be accepted and thus until 2023 ”.

In the National University of San Marcos. Lima. Peru, therefore it is necessary that it is a totally free university, compared to others that are private at a cost to students. Higher education comprises: a) university careers; and b) tertiary careers in higher education institutes (tertiary). The entrance to both the university and the tertiary is done once finished secondary school, Ministry of Education of the Argentine Nation, Ferreyra (2009). Secondary education is compulsory and constitutes a pedagogical and organizational unit for adolescents and young people who have completed primary education that is divided into two cycles. In the last eight years, educational investment has gone through a period of historical increase. This was possible thanks to a combination of factors: a product growth greater than 8% per year, a strong increase in tax pressure (which went from 23% to 33% in the period).

This law established a pattern of increased investment in the sector in relation to the Gross Domestic Product: starting from 4% in 2004, it set and exceeded the goal of 6% for 2010. It is estimated that about 44% of children aged 3 to 5 do not have access to initial education, and that only 31 children out of 100 who enter primary school finish secondary school (Rivas, Vera, and Bezem, 2010), In fact, the available data indicate that there is a relevant percentage of children under 14 who use the Internet to search for information on political and social issues, (ECLAC, 2015) This exclusion mainly affects children and youth

of lower socioeconomic status: in the lowest income quintile it reaches 12% and in the highest income only 2%.

As in Costa Rica, such returns did not decrease. The study cited suggests that educational returns in LAC (Latin America and the Caribbean) were able to decrease due to an increase in the relative supply of skilled workers, which in turn could be the result of the educational improvement experienced by countries in the nineties decade. The objective of this work is to present aspects about the level of academic performance that exists in the different university careers, in the different countries of Latin America, also considering how anxiety affects to achieve a result of academic excellence.

While talking about the impact of the latest laws in the field of education approved and compliance with the standard that sets a minimum of 180 days of class, economist Alieto Guadagni (2015) states that: "And that our calendar is the most short of the world". The director of the (CEA), and member of the National Academy of Education, deepened: "It's 720 hours, but if you consider strikes, holidays bridges and others in some provinces end up being 620". Guadagni explains that the data on which his statement was based were published in the "World Compendium of Education" of the United Nations Educational, Scientific and Cultural Organization.

Considering neuroscience as an important field of science that studies the brain and nervous system and all its aspects; such as its structure, function, ontogenetic and phylogenetic development, biochemistry, pharmacology and pathology; and how its different elements interact, giving rise to the biological basis of cognition and behavior as well as the term neuroeducation that suggests an encounter between the sciences of education and neurosciences, that is why expressions such as educational neurosciences and others.

The article is also divided into Materials and methods, which explain the strategies that were used for the application of the instruments to the citizens of different countries, their participation, the participating careers, faculties and universities, as well as the object of study, criteria of inclusion, data capture and its method represented in corresponding figures and tables. Also the part of the discussion regarding the inconveniences that were had, as well as the achievements of the research and what would be the new lines for future research. Results and conclusions were considered, as well as references. The purposes of

integrating those border sciences into education. Several important research questions are asked that refer to the concepts described as: What psychosocial factors are those that affect good academic performance? How can the family environment contribute to developing a good connectivity or synapse reflected in the good cognitive attitude? in the academic trajectory of a student ?, How does the school environment influence the motivation and performance of the student to work in a team ?, in the answer of a biannual exam which manifestation of psychic anxiety presents ?. In the absence of study, when the need arises to offer a projection of an investigation before the group, how is somatic anxiety manifested ?, In the hypothesis can it be managed as increasing the level of academic performance in the face of psychic anxiety and somatic anxiety, family performance and school environment performance, with the development of psychosocial skills that are important for citizens to increase their academic achievement and reduce the lack of interest and motivation to learn.

Neuroscience

Like most biology fields, neuroscience is assuming an "epidomy" of data collection. There are important projects underway to fully characterize proteomic, metabolic, genomic and methylomic signatures for all different types of neurons and glial cells in the brain smoke, in order to help education by strengthening academic performance. In addition, "connectomics" plans to provide the complete network structure of the brains, and "synaptomics" aims to discover all molecules and their interactions at synapses. This is a good time to pause and ask ourselves what we hope to find at the end of this huge comic brain.

The challenges to understand the human brain are immense, and neuroscientists will require powerful technologies to address them. Fortunately, a revolution in optical microscopy, driven by surprising advances in molecular labeling and digital processing, has given us a new window into the inner life of cells. The ability to see the locations and traffic of molecules and the dynamic organization of synapses with an unprecedented resolution has revealed extraordinarily complex control systems. The biochemical environment within the synapses is rarely in equilibrium and the compartments are not well mixed, so a stopped flow

biochemistry and new computational physics tools, such as Monte Carlo models, will be needed.

“Electrical recordings of one neuron at a time deep in the brain can give us clues about what information has passed through an area of the brain. But neurons are not independent, they interact with each other and with the world on a wide range of time scales. New techniques have been developed to simultaneously register and manipulate many neurons in several brain areas that can give us an idea of how the neuronal populations that give rise to behavior interact. ” (Sydney B, Terrence J. and Sejnowski, 2011), The movement of the mind, brain and education (MBE), also known as neuroeducation, is gaining momentum as a research field. Consider the recent formation of the International Society of Mind, Brain and Education and its magazine Mind, Brain and Education, which published its first issue in 2007. Also noteworthy are the neuroeducation initiative led by former president of the Society for Neuroscience Tom Carew and the growing visibility of research that unites neuroscience and education.

Education and neuroscience

Education in Mexico has had several models applied to the learning of Mexican citizens. With the beginning of the 2018-2019 school year, the new way of associating the reorganization of the system in three axes was also launched so that human beings develop their full potential in the school, where they will be able to make decisions in an integral way. , such as academic training, which consists of national observance subjects; Personal and Social Development, including socio-emotional skills; and Curriculum Autonomy, which gives school communities the opportunity to define a part of the curriculum, according to their interests and needs, ”the Ministry of Public Education said in this regard through a statement.

This is where socio-emotional skills have a substantial part from their own experience with students. One of the main concerns that I have had is the meaning and importance of each of the emotions that I still remember today, both positive and negative in different instances of the school learning process itself. “The presence of the teacher who fully inhabits

his class is immediately noticeable. The students feel it from the first minute of the year, we have all experienced it: the teacher who has just entered is absolutely there, he is warned by his way of looking, of greeting his students, of sitting down, of taking possession of his table. He has not dispersed for fear of his reactions, he has not shrunk over himself, no, he goes to his own, from good to first, is present, distinguishes every face, for him the class exists immediately ”(Pennac, 2008), In my experience for 40 years and having taught at all educational levels from kindergarten to the Doctorate, it is essential that teachers be trained in the changes that occur at the brain level against certain emotions and stimuli of citizens, so What the brain does. “In our emotional repertoire, each emotion plays a unique role, as revealed by its characteristic biological tunings. With new methods to explore the body and the brain, researchers are discovering more physiological details about how each emotion prepares the organism for a physiological class about how each emotion prepares the organism for a different kind of response ”(Goleman, 2009) . As well as the need to promote in the other citizens of countries such as Argentina, Peru and Costa Rica, is related: “Neuroeducation is the new interdisciplinary or transdisciplinary subject that promotes greater integration of Education Sciences with those that deal with development neurocognitive of the human person. Interdisciplinary, meanwhile, is the intersection of many neurosciences related to learning and teaching in all its forms; transdisciplines in that it is a new integration, absolutely original, of those others, in a new conceptual and practical category. This implies the training of neuroeducators aimed at those teachers interested in neuroscience research and neuroscientists interested in education; that is to say, neuroeducation opens the doors to a new profession and a new type of experts specialized in the field. On the other hand, neuroeducation also aims to study in the classroom the neurocognitive processes of learning and teaching during the dialogue between teachers and students” (Battro, 2011).

Materials and methods

The methodological framework observed the cultural and sociological positions of the different countries participating in the research, the research was exploratory to be able to know the impact of academic performance in the different universities of Mexico, Central America and South America, it was a cross-sectional study conducted in the Autonomous University of Tamaulipas, including independent variables: family support, school environment, psychic anxiety and somatic anxiety that are presented in table 1, where its variable, description and type of relationship are described as; Dependent variable is academic performance. A random sampling was carried out by means of which a sample of 150 students was obtained who study the upper level of bachelor's degree in 2017. Therefore, it is considered that there was a free, voluntary and dynamic academic action for participating in each of the universities and powers, when requesting the consent for participation in the research, where the teacher had to take special care to give instructions to the participating students, where he shows that he is potentially linked with him feeling of the students and for having a certain relationship of dependence or ability pedagogical and be aware of the type of pressure that the student shows or that nothing has to do with the student in their relationship (DoH, 2013). At the time of applying the different instruments of academic performance (Medina, L., and Martell, F. 2008) and anxiety (Hamilton.M. 1959), 150 in total in the different degree programs.

Several criticisms described were presented as: a) what is the filling of the questionnaires, b) the number of students participating in the survey, c) how the formats are presented, d) the material for filling (pencil, # 2). This is when the analytical approach proposed by (Lucas, 2001) arises, which mentions "who analyzes the effects of social origin, both on the probabilities of transition at different levels." As in the location of the people and the curricular choices they have adopted, which indicates that an educational level is not universal, the most socioeconomically favored use their advantages and resources to ensure access to that level (quantitative advantage); when access to the level becomes almost universal, the inequality of origin will not disappear. That is, the most economically favored people will seek to occupy better positions within a stratified education system.

The population targeted in the research is made up of countries such as: Mexico, Argentina, Peru and Costa Rica, with their own characteristics of the question sections that have to do with independent and dependent variables respecting from culture, type of teacher hiring, design curriculum and the participating educational program, according to their regionalization, studying at the university, applying 25 questionnaires with open questions such as name, age, sex, number of siblings, place in the family, if you have any type of

scholarship and the average and the others by multiple choice such as family aspects, school environment, etc. and on the other hand the Hamilton anxiety scale with multiple choice questions and which is divided into psychic anxiety and somatic anxiety, the frequency was used of use that included the numbers shown in table 2. by classroom, in each faculty, (Medicine, Commerce, Economics, Technologies of the Information and Administration).

During the months of June-December 2018. Considering that operationally if more people had been selected, there would be difficulties with the application of the questionnaires used, due to the need to have more pollsters than were available, as well as the Time and space mobility. The inclusion criterion was that the student citizens were enrolled in the university and in the courses taught in the faculties. Where the maximum number of students per classroom is 25, between the ages of 19 and 21, with a mixed gender, the filling of them was carried out in the classroom, at the time of teaching the subject According to each professor participating in the research and their available time, the sampling is not probabilistic by the selection of the students, the criteria were inclusive, each student was given an explanation of the filling of the instruments.

It began with the academic performance (Medina, 2008) that contains 59 items and which are divided into five subgroups as variables: school environment, families, under the Likert scale (1- Strongly agree, 2-Agree, 3- Neither agree nor disagree, 4- Disagree, 5- Strongly disagree). Likewise, the anxiety instrument (British Journal of Medical Psychology. 1959), which is divided into two variables, psychic anxiety with seven items and somatic anxiety, also with seven items, both under the Likert scale (1-absent, 2 -Slight, 3-Moderate, 4-Severe, 5-Very Serious, students took approximately 60 minutes to complete, where for academic performance it was 40 minutes and for anxiety 20 minutes, the student's name was omitted to ensure the anonymity and security of the respondent.

Once the filling was completed, the instruments were put in an envelope and sealed in front of the students, a matrix was created for data that includes the coding of questions, fields and possible answers, the instruments were collected, checking that the items were completely filled, Subsequently, the data was captured in the statistical package version, IBM SPSS, 17.0, for analysis of statistical information with the advice of a specialist in psychology. The instruments used in this research were published under the Spanish

language, are validated and adapted for the study. Reviews were also made to other similar examples with this study, with similar experience on various authors and their original version, such as adaptations to other contexts.

The method used was quantitative oriented to conclusions or manipulation with descriptive variables in figure 1, with its variable, the family performance that is manifested according to the family environment in the student's education and in figure 2, considers the school environment performance, whose The student's school environment is objective, both are synchronously expressed in cross-sectional designs correlated to the Pearson coefficient, taking as a variable dependent on the academic performance where it was sought to answer certain research questions, relate to the contents of the table1.

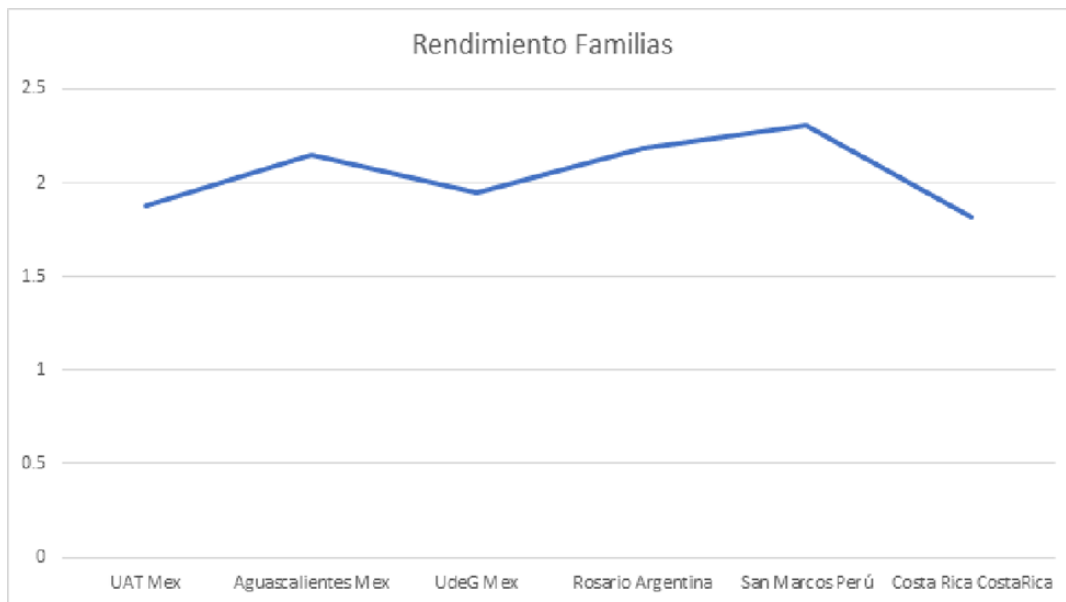
Tabla 1. Explicación de las variables del modelo

Variable	Descripción	Tipo de relación
Rendimiento académico (Y)	Aprovechamiento de conocimientos adquiridos en el aula bajo un indicador numérico. Decimal.	Dependiente: Variable principal para analizar los factores psicosociales que influyen para la adquisición de los conocimientos.
Apoyo familiar	Personas que tienen relación económica, moral y ética con el estudiante cuando esta estudiando	Independiente: Variable considerada por ser un factor que puede influir en el estado emocional del estudiante, donde le pueden otorgar motivación, a través del estímulo afectivo para mejorar el rendimiento académico, la vida y el trabajo
Ambientes escolares	Situación que influye en la escuela como sus factores sicosociales y ambientales, propicios para el aprendizaje del alumno	Independiente: Variable considerada para el desarrollo emocional y profesional del estudiante, así como para su integración con los compañeros de estudio y su relación con los docentes y administrativos de la institución educativa y mejorar el rendimiento académico.
Ansiedad Psíquica	Persona que tiene su conducta algún estado actitud asertiva, pasiva o agresiva manifiesta en algún grado de ansiedad	Independiente: Variable considerada debido a que está relacionada con lo lógico, mental, psicológico en determinado tipo de capacitación o instrucción recibida para el trabajo en equipo o estudios y esto puede influir para mejorar el rendimiento académico
Ansiedad Somática	Persona que tienen alguna situación en particular con sus movimientos, gestos, reacciones, destrezas y habilidades	Independiente: Variable considerada debido a que está relacionada con el tipo de movilidad, habilidad y destreza en sus miembros del cuerpo al momento de alguna capacitación o instrucción recibida para el trabajo en equipo o estudios y esto puede influir para mejorar el rendimiento académico.

Fuente: Elaboración propia

The purpose of recognizing aspects associated with table 1, the academic performance of the students, shown in Figure 1, and Figure 2. where the family performance and school environment performance that are manifested in the Universities participating in the study, such as: National University of San Marcos de Lima, Peru, is the one with the least family support he felt and there is a regular relationship between family members, followed by the Faculty of Economic and Statistical Sciences of the National University of Rosario, Argentina and then the University Autonomous of Aguascalientes, Mexico, later the Benemérita University of Guadalajara, Mexico, then the Autonomous Universities of Tamaulipas, Mexico and the University of Costa Rica, where the latter is the one that gave the most support to his family to the children. "Some frequent answers that relate to these variables too: social isolation, withdrawal, abandonment of studies or work, without depressive shots, alterations in your self-concept, etc.". (López-M, Haro Amezcua y Pichardo, 2000).

Figura 1. Variable independiente sobre Rendimiento Familias.



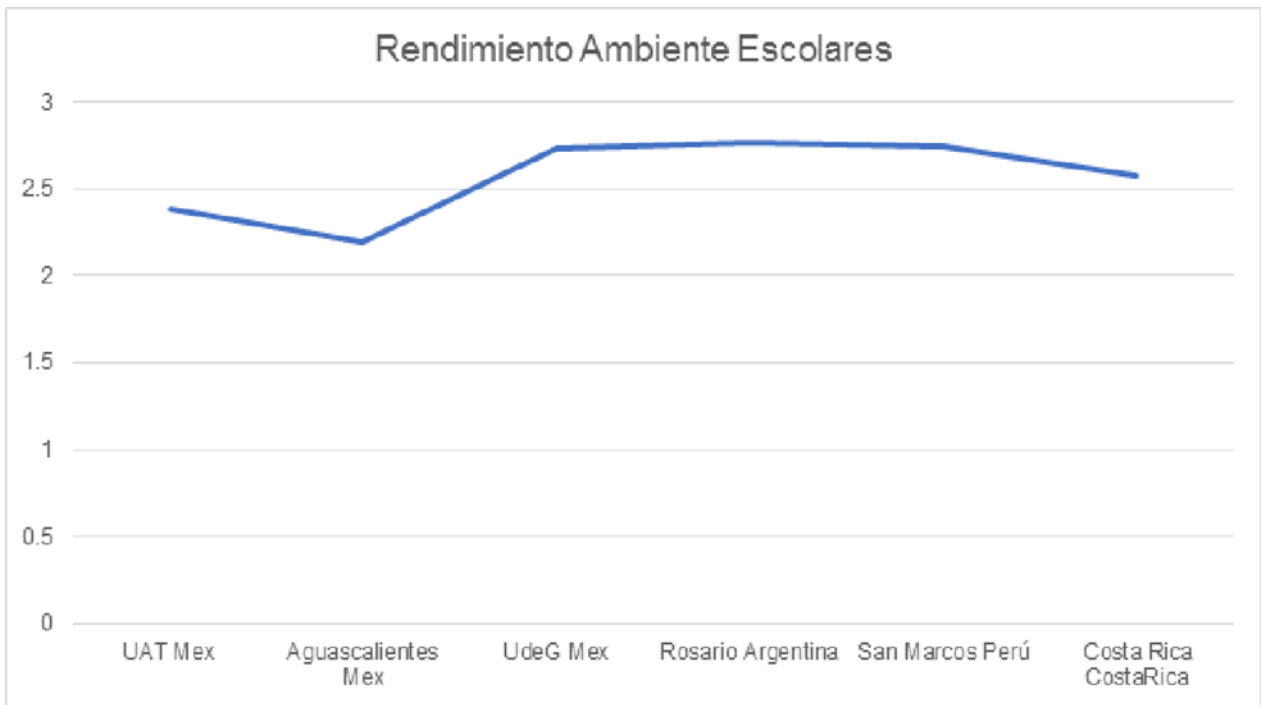
Fuente: Elaboración propia

Figure 1. Performance Families. Indicate the names of the participating universities, in relation to the families' performance to the score corresponding to the Likert scale where 1- Strongly agree, 2- Agree, 3-Neither agree nor disagree, 4- Disagree, 5- Strongly disagree.

In Figure 2. The school environment performance variable. It is the variable where three fundamental items are contemplated, where the first one is related to the school environment. Are there students who separate from the class group or isolate themselves so as not to work in a team? The second is, is it necessary that in addition to acquiring disciplinary knowledge and pedagogical and didactic skills, a critical thinking related to verbal reasoning and argument analysis skills is developed in the student body ?, the third mentions that if the ability to explain, predict and control events of everyday life and ability to reflect on them, has the ability to reason ?, In the recognition and definition of a problem from certain data, the selection of relevant information and contrast of the different solution alternatives and their results (Yanes and Ries, 2013).

You can observe the Academic Performance with the independent variable School Environment, we observe that in the Benemérita University of Guadalajara, Mexico, it has the same as the National University of San Marcos de Lima, Peru and the Faculty of Economic and Statistical Sciences of the University Nacional de Rosario, Argentina, a more favorable atmosphere between the group relationship, followed by the University of Costa Rica, Costa Rica, and the University of Tamaulipas, Mexico, which have a relationship that is considered as not much trust among students, because they have the flexible educational system, where each student selects their group and teacher, then the Autonomous University of Aguascalientes, Mexico. It does not have any trustworthy environment among students and each one sees for their own academic development, “A comfortable environment is needed to acquire the knowledge and develop the skills of the assessed subject”, and since it is essential that the student “needs to strengthen most of the knowledge and develop the skills of the assessed signature” (SEP 2013).

Figura 2. Variable independiente sobre rendimiento ambiente escolares



Fuente: Elaboración Propia

Figure 2. School Environment Performance. Indicate the names of the participating universities in the different countries, in relation to the score corresponding to the Likert scale where 1-Strongly agree, 2- Agree, 3-Neither agree nor disagree, 4- Disagree, 5- Strongly disagree

Results

The results of the analysis of the points on academic performance are achieved through the direct participation of the countries involved in this research and with the determined and direct action of their universities interested in knowing what indicators and factors are those that are affecting or benefiting their academic programs at the higher level, as well as which are independent variables that support the dependent variable academic performance.

The multivariate analysis is defined by Hair et al., (1999) which has the purpose of measuring and explaining and predicting the degree of relationship of theoretical values, are

linear combinations of variables composed from empirical weights applied and in this work towards academic performance related to anxiety. The correlation matrices that are shown, as dependent and independent variables are related highlighting, there may be a low or high significant correlation with variables such as: family performance, school performance and psychic anxiety and somatic anxiety. Considering the Pearson correlation (r) is greater than 0, which will correspond to a positive correlation with a direct sense and if its proximity to 0 is positive but low.

With independent variables such as: family performance, school environment performance, psychic anxiety and somatic anxiety, where they were checked to analyze the interaction of the variables. A multiple linear regression model was also generated, estimated by the method of ordinary least squares, with the corresponding predictive procedure that has responded to the characteristics in the Likert scale. Likewise, the independent variables already specified above, such as: “family performance”, “school environment performance”, “psychic anxiety”, “somatic anxiety”, the work was elaborated according to what is indicated in equation 1.

$$\text{Academic performance } Y = f_0 + f_1 \text{ rendimiento familiar} + f_2 \text{ ansiedad psíquica} + f_3 \text{ ansiedad somática) (1)}$$

Equation 2 is also available, which represents the theoretical model that is presented and that analyzes the academic performance (Y) with the variables already mentioned in table 1. According to the scores of the subjects in two variables, one considered as predictive variable psychic anxiety (x) and the other as response variable families (y) that are represented by the equation of a straight line:

$$Y = \beta_0 + \beta_1 \text{ rendimiento ambiente escolares} + \beta_2 \text{ ansiedad psíquica} + \beta_3 \text{ ansiedad(2)}$$

A reliability analysis of the data obtained from the questionnaire was carried out considering the Pearson model. Student t values indicate all the coefficients of the explanatory variables of the model are statistically significant, because they were greater than 1 in absolute terms and with p -value less than 0.05; In addition, the signs agree with the empirical analysis. Therefore, all explanatory variables within the model are considered.

Where they are shown in the table. 2. The coefficients estimated in the model according to their structural form.

Tabla 2. Resultados estadísticos del modelo en su forma estructural

	Variable dependiente	Variables independientes			
	constante	Familia	Ambientes escolares	Ansiedad psíquica	Ansiedad somática
Coeficiente estimado	3.75				
<i>T</i>	3.4	25.8	31.7	29.1	28.0
Valor. p	0.000	0	0	0	0
F	1.78				
Prob F	0.000				

Fuente: Elaboración propia

Table 2. In this information, the regression estimate is used to indicate the effect that family performance has on young people and school environment performance and its affinity with psychic anxiety and somatic anxiety that are involved in academic performance.

The coefficients obtained show that there is a direct relationship between academic performance and family performance and school environment performance; more, however, an inverse relationship is observed between the types of psychic anxiety and somatic anxiety among students.

Tabla 3. Frecuencias de la variable ambiente escolares

Variable ambiente escolares	Frecuencia	Porcentaje	Porcentaje valido	Porcentaje acumulado
2,2	1	16.7	16.7	16.7
2,3	1	16.7	16.7	33.3
2.5	1	16.7	16.7	50.0
Valido 2.7	1	16.7	16.7	66.7
2.7	1	16.7	16.7	83.3
2.7	1	16.7	16.7	100.0
Total	6	100.0	100.0	

Fuente: Elaboración Propia

Table 3. Here the frequency relationship on the independent school environment variable is shown. It can be seen that the frequency on the school environment performance variable is selected and loaded on the item in the 6 universities involved in the research.

In the following Table 4. A Pearson correlation is shown. You can see the correlations between the dimensions of study. With Pearson's r technique. Among the independent variables of psychic anxiety and family performance, here is determined under an index their absolute values ranging between 0 and 1 being in the graph it is shown that there is a lower correlation that is effective for its reliability under a certain test of its validity at show -.3 and .5.

Tabla 4. Correlación Pearson entre las variables de ansiedad psíquica y rendimiento de familias

Variabes independientes		Ansiedad Psíquica	Familias
Ansiedad psíquica	Correlación de Pearson	1	-3.21
	Sig (bilateral)		.535
	N	6	6
Rendimiento Familias	Correlación de Pearson	-3.21	1
	Sig (bilateral)	.535	
	N	6	6

Fuente: Elaboración Propia

Table 4. The independent variables of psychic anxiety and family performance are shown. Here you can see the Pearson correlation between two variables, where its correlation is negative -3.2 is not significant, since both are effectively correlated in the opposite direction, considering data on the sample of the 6 universities involved.

In Table 5. Pearson's Correlation is seen. Between the dimensions of study. With Pearson's r technique. Among the variables of somatic anxiety and family performance, here is determined under an index their absolute values ranging from 0 to 1 being in the graph it is shown that there is a lower correlation that is effective for its reliability under a certain test of its validity at show -.3 and .5.

Tabla 5. Correlación de variables independientes de ansiedad somática y familias

Variables independientes		Ansiedad somática	Familias
Ansiedad somática	Correlación de Pearson	1	-.324
	Sig (bilateral)		.532
	N	6	6
Rendimiento de Familias	Correlación de Pearson	-.324	1
	Sig (bilateral)	.532	
	N	6	6

Fuente: Elaboración propia

Table 5. Somatic anxiety and performance Families. Here you can see the correlation between two variables, independent somatic anxiety and performance families, where their correlation is negative, -.32 not significant, since in both they are effectively correlated in the opposite direction, considering data on the sample of the 6 universities involved

The following Table 6 shows the statistical results of the model in its structural form. Where the correlation variables can be seen correlations between the dimensions of study. With Pearson's r technique Considered for the research study among the seven variables that show values with negative and positive indices with low reliability in some research data with the sample of 6 participating universities.

Tabla 6. Correlación de variables independientes de rendimiento familias, ambiente escolar, ansiedad psíquica ansiedad somática

Variables independientes		Familias	Ambiente escolar	Ansiedad psíquica	Ansiedad somática
Rendimiento Familias	Correlación de Pearson	1	.223	-.321	
	Sig(bilateral)		.571	.535	
	N	6	6	6	6
Rendimiento Ambiente Escolares	Correlación de Pearson	.223	1	-.651	
	Sig(bilateral)	.671		.152	
	N	6	6	6	6
Ansiedad Psíquica	Correlación de Pearson	-.321	-.551	1	
	Sig(bilateral)	.535	.102		
	N	6	6	6	6
Ansiedad Somática	Correlación de Pearson	-.324	-.725	.565	1
	Sig(bilateral)	.532	.102	0.02	
	N	6	6	6	6

Notas. *La correlación es significativa en el nivel 0.05 (dos colas). ** La correlación es significativa en el nivel 0.01 (dos colas), N= Número de participantes en el estudio.

Fuente: Elaboración propia

Table 6. Correlation variables. Where independent variables are observed with negative and positive correlations.

The results obtained show that the variables used during the investigation such as family performance and school environment performance show that the items are considered as academic risk factors for students enrolled in different countries such as: Argentina, Costa

Rica, Peru and Mexico . Where positive effects were obtained such as receiving students support from their families, when they are studying, where that increases by 10% would improve the student's academic performance, coupled with other variables such as school environment performance, with normal anxiety psychic and somatic, there are also negative effects where it is considered that if there is no attention, or support from relatives towards the child being studied by relatives, the effort to overcome their academic performance will be reduced by up to 20%, because not receiving support deteriorates the emotional and motivational state and can create a serious psychic and somatic anxiety.

The following Table 7 shows the positions obtained according to the participating universities and the statistical results obtained by this research work on academic performance.

Tabla 7. Listado de universidades según su rendimiento académico de menor a mayor.

Número	UNIVERSIDAD
1	Autónoma de Aguascalientes. México
2	Nacional Mayor de San Marcos, Lima, Perú
3	Autónoma de Tamaulipas, México
4	Autónoma de Guadalajara, México
5	Facultad de Ciencias Económicas y Estadística de la Universidad Nacional de Rosario, Argentina
6	Costa Rica, Costa Rica

Fuente: Elaboración propia

Table 7. It shows the universities that showed lower academic performance and greater anxiety (1), even the university with better academic performance and lower anxiety (6).

Discussion

Interesting results were obtained by identifying the problem on each of the aspects of academic performance in each participating country, because it helps to highlight in a positive way how academic achievement can be improved on the negative state of the universities where the indicators each again downward, for example in a study conducted by the BBC (British Broadcasting Corporation) mentions that Latin American countries "with worse academic performance", This time is a study of the Organization for Economic Cooperation and Development (OECD), based on data from the 64 countries participating in the Program for International Student Assessment (PISA), which indicates that the region is below the global school performance standards, In fact, among the nations that appear in the report, Peru, Colombia, Brazil and Argentina are among and the ten whose students have a lower level in areas such as mathematics, science and reading.

Latin American countries were well below the average established by the OECD. The four South American countries - along with Indonesia, Qatar, Jordan, Tunisia, Albania and Kazakhstan - are those with the highest number of 15-year-old students below the average performance in math, reading and science. (PISA Evaluation, 2015) Considering in this work that the constitutional norms, which surely helped to consider and identify the strategies used by each government for the bases of education and that they dedicate to their peoples, so that in this study it serves as an agreement to the analysis and results obtained, where new lines of research are proposed where neuroscience is included within the cognitive development of teachers and students to continue conducting a longitudinal study of generations and previous cohorts, both of the qualitative and quantitative model, thus allowing them to be Their variables are really significant with cross-sectional studies in the short, medium and long term, based on their independent and dependent positions, according to the findings that are being developed in higher education.

It is worth mentioning that to increase academic performance, it is necessary to establish the different criteria that are always linked while preserving the psychic and physiological, cultural and scientific aspects of each country, especially taking into account those concepts that neuroscience manages between the brain and nervous system and its relationship with the academic achievement in education of each country involved in this research.

On the other hand, it is distinguished that the academic level has the family in the positive influence on the monthly personal income, since an increase of 10% in the academic level would cause an increase in the monthly personal income of 2.4%. This is consistent with the analysis carried out by Preoțiuc, Volkova, Lampos, Bachrachy and Aletras (2015) because they discovered correlations that show that a higher educational level indicates higher income. As mentioned by Picatoste, Pérez and Ruesga (2018), the higher level of education in a country leads to a higher level of income per capita, because a higher level of education translates into higher labor productivity and a higher level of performance throughout society. Therefore, it is considered, as well as various actors, at the educational level as a fundamental piece to determine the monthly personal income. Several authors mention that when investing in human capital (education and learning skills).

Income can be improved and is considered one of the most effective ways to reduce income inequality in the long term (Jaumotte, Lally Papageorgiou, 2008; Abdullah, Doucouliagos Manning, 2011; Gruber, Kosack, 2013; and Shahabadi et al ., 2016). In addition, it is considered that higher academic performance of education allows an indicator of academic excellence for the institution, which in turn gives the individual the possibility of accessing different sectors of production and increasing their income Islam y Slack (2016).

This research allows clarifying the importance of academic performance, family support and the school environment, psychic anxiety and somatic anxiety in countries such as Costa Rica, Argentina, Peru and Mexico. supported by Neuroscience so that individuals can increase their rates of memorization, processing and mental logic and their academic quality. However, the sample only includes university students who are mostly from public universities, where the type of malnutrition is detected and somatic anxiety increases and sometimes psychic anxiety, considering that there is mostly little income and little family economic support. The main strength of this research is that you can build a foundation based on the area of neuroeducation to be able to conduct training on the behavior of the brain and nervous system in the face of learning.

Finally, this work can be the basis of a more detailed analysis by the characteristics that could be obtained, academic performance and anxiety (analyzed in detail). There is the

possibility of implementing new types of more rigorous analysis at specific intervals of school averages such as: results of assessments in the subjects taken, the teaching of new subjects by newly hired teachers, a multivariate analysis (ANOVA and multi ANOVA) , which will serve as the next phase of the next research project on biological neurocomputing dedicated to the interpretation of instructions that are handled in examinations.

Conclusions

The results of the analysis allowed us to extract a database, to have good conclusions about the research work that was raised under the follow-up of a doctoral thesis with the title on psychosocial factors in the academic performance of the Autonomous University of Tamaulipas and allowed contrast your variables with local scenarios, to international management, thus allowing you to visualize with greater representativeness the management of instruments and information focused on academic performance.

Regarding the objective, if we could find and identify that academic performance, is a function of psychosocial factors and abilities, where there are important differences and aspects, which should be taken into account in the citizens of the public universities of the countries Participants such as: Autonomous University of Tamaulipas, Mexico, Autonomous University of Aguascalientes, Benemérita University of Guadalajara, Autonomous University of Tamaulipas, Argentina, Faculty of Economic and Statistical Sciences of the National University of Rosario, Peru, National University of San Marcos de Lima , Costa Rica, University of Costa Rica. However, considering as a reference, the authors agree that the indicative aspects are very important in some Universities such as the Autonomous University of Hidalgo, Mexico. Because it was identified that academic performance is a huge problem, which must be attacked with innovative strategies and methodological models of the fourth generation, on teaching and learning, where it is shown from the hiring of teachers to the entry and exit of the student, where the congruent definition of the profile of a graduate, in any academic program.

Considering the improvement of this research, it was possible to identify the use of new variables to improve future research such as: school profile, tutorials, counseling, semester average, student nutrition etc. with the idea of improving and identifying solutions for new generations based on better values and indicators in the public universities of the participating countries.

The education policy is in accordance with the regulations when they review their concepts of each country such as that of Mexico that says, "It will be of quality, based on the constant improvement and the maximum academic achievement of the students"; in Peru, "the student has the right to training that respects his identity, as well as good psychological and physical treatment", in Costa Rica, "Public education will be organized as an integral process correlated in its various cycles", in Argentina, "Develop harmoniously, all the faculties of the human being and will foster in him, at the same time, the love of the Fatherland, respect for human rights and the awareness of international solidarity". As well as being able to determine the frequencies, correlations, regressions, standard deviations, coefficients, Bootstrap specifications and descriptive statistical data to identify the following points: Regarding the variables and their indicators in the means were: the human profile, academic responsibility, Psychic anxiety and somatic anxiety, were considered with improvements, were positive correlations, with an effectiveness greater than 99%.

This is consistent with what was previously stated by other authors because the lack of family support, the school environment, psychic anxiety and somatic anxiety is used as a means to indicate low or high academic performance; On the other hand, a higher academic level generally translates into greater motivation and emotion on the part of the student and therefore, in a higher level of knowledge. The results of this research allowed us to identify the importance of improving the level of education and psychosocial skills of the student population, mainly in those related to teamwork, because, in order to obtain the economic and social benefits of adopting these tools, appropriate educational programs that allow individuals to develop better educational skills in andrology and pedagogy should be designed, implemented and evaluated.

Perform an exhaustive analysis of the cross-correlation matrices that provide useful information on the performance of academic performance. The observations that were made were for different time delays in the correlation matrix of the Spearman variation coefficient due to the interdependence between the variables. As regards p. a punctual correlation cannot be made, with its respective counterpart, because it does not have useful information that can be used to describe its behavior in its respective order.

References

- Abarca, A, y Sánchez, M. A. (2005). La deserción estudiantil en la educación superior: El caso de la Universidad de Costa Rica. *Actualidades investigativas en educación*. 5, pp.1-21
- Abdullah, A., Doucouliagos, H. & Manning, E. (2011). Education and Income Inequality: A Meta-Regression Analysis. (Unpublished manuscript). Deakin University. Retrieved from <https://pdfs.semanticscholar.org/3745/da57966971c0c86abae05c59eda3e28d170f.pdf>
- Battro, K.& Fischer, L. (2011) "The educated brain". Essays in neuroeducation. Cambridge University Press.
- Hamilton M. (1959). "The assessment of anxiety states by rating", *british Journal of Medical Psychology*, 32(1):50-55. doi: <https://doi.org/10.1111/j.2044-8341.1959.tb00467>.
- Caetano, G. (2015) "¿Hacia un nuevo paradigma integracionista en el MERCOSUR? Contextos y desafíos de la encrucijada actual", *Relaciones Internacionales*, Grupo de Estudios Internacionales (GERI), UAM, Número 30. Recuperado de <http://www.relacionesinternacionales.info/>.
- Canales, A. (2006). La cobertura y el financiamiento de la educación superior en la gestión del cambio. *Reencuentro de la Universidad Autónoma Metropolitana Unidad Xochimilco*, 45, 4.

Castro, J. (2011), Acoso escolar. *Neuro-Psiquiatría*, 74, (2), 242-249.

CEPAL (Comisión Económica para América Latina y el Caribe)(2015), *Informe regional sobre el examen y la evaluación de la Declaración y la Plataforma de Acción de Beijing y el documento final del vigesimotercer período extraordinario de sesiones de la Asamblea General (2000) en los países de América Latina y el Caribe (LC/L.3951) (2014b), Pactos para la igualdad: hacia un futuro sostenible (LC/G.2586(SES.35/3))*, Santiago de Chile.

CONSEJO NACIONAL DE POBLACIÓN (2012). *Extracto de proyecciones de población (2012-2050)* Recuperado de https://www.gob.mx/cms/uploads/attachment/file/63977/Documento_Metodologico_Proyecciones_Mexico_2010_2050.pdf

Consejo Nacional de Rectores [Conare]. (2013). *Compendio de Leyes, Decretos y Convenios de la Educación Superior Universitaria Estatal en Costa Rica*. Recuperado de https://www.conare.ac.cr/images/docs/leyes_acuerdos/OPES_22013_Leyes_convenios_y_decretos.pdf

The Declaration of Helsinki [DoH]. (2013). *Ethical Principles for Medical Research Involving Human Subjects* was revised by the *World Medical Association (WMA)* at the *64th WMA General Assembly*, Fortaleza, Brazil. Recuperado de <https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf>

Evaluación PISA (2015) *Resultados de México*, Recuperado de <http://www.oecd.org/pisa/PISA-2015-Mexico-ESP.pdf>

Ferreya, H, Cingolani, M, Eberle, M, Gallo, G, Larrovere, C. y Luque, M. (2009). *Educación Secundaria Argentina. Propuestas para superar el diagnóstico y avanzar hacia su transformación*. *Noveduc*. 373.(5), 82. Recuperado de <https://scholar.google.com/citations?user=dcE4Ow4AAAAJ&hl=es>

Goleman, D. (2009). *La inteligencia emocional*. España: Editorial Zeta.

- Gruber, L. & Kosack, S. (2013). The tertiary tilt: education and inequality in the developing world. *World Development*, 54, 253-272.
- Guadagni A. (2015) - Clarín.com Sociedad, Educación, Buenos Aires Argentina.
- Guadalupe, César (2002). *Indicadores de cobertura, eficiencia y flujo escolar. Necesidades de política, problemas metodológicos y una propuesta*. Santiago de Chile, Unesco.
- Guadalupe, César (2015). *Contar para que cuente: una introducción general a los sistemas de información educativa*. Lima Perú, Universidad del Pacífico.
- Hair, J. F. et al. (1999): *Análisis Multivariante*. Madrid, Prentice Hall
- Islam, M. & Slack, F. (2016). Women in rural Bangladesh: Empowered by access to mobile phones. Paper presented at the 9th International Conference on Theory and Practice of Electronic Governance. Montevideo, Uruguay.
- Jaumotte, F., Lall, S. & Papageorgiou, C. (July 2008). Rising Income Inequality: Technology, or Trade and Financial Globalization? International Monetary Fund. Retrieved from <https://www.imf.org/external/pubs/ft/wp/2008/wp08185.pdf>.
- Kessler, G. (2004). *Sociología del delito amateur*, Buenos Aires: Paidós.
- Ley Nacional de Educación (2007). Hacia una educación de calidad para una sociedad más justa. (Ley N°. 26.206) Recuperado de <http://www.bnm.me.gov.ar/giga1/documentos/EL002610.pdf>
- López M.; Fernández de Haro, E., Amezcua, J., & Pichardo, M. (2000). ¿Difieren en autoconcepto los adolescentes con baja visión de los adolescentes con visión normal? *Integración*, 33, 14-20.
- Lucas, S. (2001), "Effectively Maintained Inequality: Education transitions, track mobility and social background effects", *American Journal of Sociology*, 106, (6), 1642-1690.
- Medina, L, y Martell, F. (2008) *Evaluación Integral del rendimiento escolar en educación superior. Instrumentos de evaluación*, Veracruz México, Covaev

- OCDE (2016). PISA, 2015: Assessment Framework Key competencies in reading, mathematics and science. OCDE. Recuperado de http://www.oecd.org/document/44/0,3746,en_2649_35845621_44455276_1_1_1_1,00.html. [Fecha de consulta: 23/ enero/2015].
- Otárola A. (1999) “*La Constitución de 1993. Análisis Comparado*” (pp 937) Santiago de Chile: Paulinas.
- Pennac, D. (2008) *Mal de escuela*. Barcelona: Editorial Mondadori.
- Picatoste, J., Pérez, L.& Ruesga, S. M. (2018). A new educational pattern in response to new technologies and sustainable development. Enlightening ICT skills for youth employability in the European Union. *Telematics and Informatics*, 35, 1031-1038.
- Preoțiu, D., Volkova, S., Lampos, V., Bachrach, Y. & Aletras, N. (2015). Studying user income through language, behaviour and affect in social media. *PLOS ONE*, 10(9), 1-17.
- Rivas, A., Vera A., y Bezem, P. (2010). *Radiografía de la educación*. Argentina. Nahon
- SEP (2013). *Las estrategias y los instrumentos de evaluación desde el enfoque formativo*. Libro 4. Serie: herramientas para la evaluación en educación básica. México: SEP.
- Shahabadi, A., Nemati, M. & Hosseinidoust, S. (2016). The Effect of Education on Income Inequality in Selected Islamic. *Journal of Asia-Pacific Studies* 14(2), pp.61-78
- Sydney B, Terrence J (2011) Understanding the Human Brain, *Science*, 334, (6056), p. 567.
- Yanes, C. y Ries, F. (2013). Liderando el cambio: estudio sobre las necesidades formativas de los futuros docentes de secundaria. *Revista Fuentes*, 14, pp. 105-124. Recuperado de <http://www.revistafuentes.es/>

Rol de Contribución	Autor (es)
Conceptualización	PRINCIPAL. Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, Pedro Flores Peña, Miguel Ángel Montalvo Vivanco, Oscar Mena Redondo
Metodología	PRINCIPAL Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, IGUAL Jorge Alberto Aimaretti, Oscar Mena Redondo APOYO Pedro Flores Peña, Miguel Ángel Montalvo Vivanco
Software	Joel Luis Jiménez Galán
Validación	PRINCIPAL. Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, Pedro Flores Peña, Miguel Ángel Montalvo Vivanco, Oscar Mena Redondo
Análisis Formal	PRINCIPAL. Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, Oscar Mena Redondo
Investigación	PRINCIPAL. Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, Oscar Mena Redondo, APOYO Miguel Ángel Montalvo Vivanco
Recursos	PRINCIPAL. Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, Pedro Flores Peña, Miguel Ángel Montalvo Vivanco, Oscar Mena Redondo
Curación de datos	PRINCIPAL Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf
Escritura - Preparación del borrador original	Joel Luis Jiménez Galán
Escritura - Revisión y edición	PRINCIPAL Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, APOYO Pedro Flores Peña, Miguel Ángel Montalvo Vivanco
Visualización	PRINCIPAL Joel Luis Jiménez Galán, IGUAL Patricia Lorelei Mendoza Roaf, Jorge Alberto Aimaretti, Pedro Flores Peña, Oscar Mena Redondo, APOYO Miguel Ángel Montalvo Vivanco
Supervisión	Joel Luis Jiménez Galán
Administración de Proyectos	Joel Luis Jiménez Galán
Adquisición de fondos	Joel Luis Jiménez Galán