Comparison of digital learning barriers in university students

Comparativo de barreras de aprendizaje digital en estudiantes universitarios

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Abstract

The general objective of the research was to identify the variables that integrate the learning barriers in students at the higher level of the Autonomous University of Coahuila, the methodology used was quantitative, transversal, exploratory, descriptive and explanatory with a comparative and integrational methodical derivation. The collection of responses was carried out from a virtual instrument composed of 23 signalitic variables and 105 variables on a decimal scale of ratio. The sample consisted of 320 subjects, for which a non-probabilistic sample was used through the convenience strategy. The statistical levels that were processed were: frequencies and percentages in addition to comparison. The main results indicated that students are in family contexts within which there is helplessness, disinterest, violence and detachment, which generates limitations and complications that are reflected in the teaching-learning process. The outstanding conclusions are that most of the havoc and complexities for the educational process of the university student come from digital skills, abilities and abilities, which can be said given that tools, platforms and virtual sites have symbolized limitations and arduous obstacles in the generation of student knowledge, as well as.

Resumen

El objetivo general de la investigación fue identificar las variables que integran las barreras de aprendizaje en los estudiantes en nivel superior de la Universidad Autónoma de Coahuila, La metodología que se utilizó fue cuantitativa, transversal, exploratoria, descriptiva y explicativa con una derivación metódica comparativa e integracional. La recopilación de respuestas se realizó a partir de un instrumento virtual integrado por 23 variables signalíticas y 105 variables en una escala decimal de razón. La muestra se conformó por 320 sujetos, para lo cual se utilizó un muestro no probabilístico mediante la estrategia por conveniencia. Los niveles estadísticos que se procesaron fueron: frecuencias y porcentajes, además de comparación. Los principales resultados señalaron que los estudiantes se encuentran en contextos familiares dentro de los cuales existe un desamparo, desinterés, violencia y desapego, lo cual genera limitantes y complicaciones que se plasman en el proceso de enseñanza-aprendizaje. Las conclusiones destacadas radican que la mayor parte de estragos y complejidades para el proceso educativo del estudiante universitario provienen de las habilidades, destrezas y capacidades digitales, lo cual se puede afirmar dado que las herramientas, plataformas y sitios virtuales han simbolizado limitantes y obstáculos arduos en la generación del conocimiento del alumno, asimismo, se observó que la muestra estudiantil ha experimentado emociones apáticas, de desánimo y de indiferencia durante el proceso de integración a la modalidad establecida por la institución en la que pertenecen.

Learning barriers, Digital skills, Educational Environment

Barreras de aprendizaje, Habilidades digitales, Entorno educativo

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Introduction

The pandemic caused by the COVID-19 virus has caused in the student community different problems and deficiencies in spheres related to the emotional, family, school and digital, within which situations such as: under the domain of technological tools are reflected; emotional imbalances; negative attitudes; family experiences that threaten emotional health and poor school performance, which can lead to school dropouts. It is throughout the quantitative research of transversal design with an exploratory, descriptive and comparative scope that it seeks to inspect and address in a pertinent way the themes of learning barriers, in order to identify the significant differences, and with it, reach an understanding on what are those limitations and deficiencies that hinder the teaching-learning processes.

For these reasons, it is absolutely necessary to touch in a profound way these issues to offer solutions and proposals in favor of the integral formation of the learner. To this end, throughout this article the sections of practical background, theoretical framework, methodological procedures, analysis and discussion of results, conclusions, bibliographic references will be presented.

General question

What variables make up the learning styles of higher education students from various states of Mexico?

General objective

Identify the variables that make up the learning styles of Higher Education students from various States of Mexico.

Specific objectives

−   Show the percentage of students who study in the City of Saltillo Coahuila

−   Frequency the percentage of students who study at the Autonomous University of Coahuila.

−   Contrast the differences of opinion that exist between the age of 18 years and 23 years regarding the method of study.

−   Compare the differences of opinion that exist between the Engineer in Business Management and the Lic. in Business Administration, with respect to conventional attitudes.

−   Define the factor that integrates the study method, with respect to agentic processing and conventional attitudes of university students.

Research questions

−   What is the percentage of students who study in the City of Saltillo?

−   What is the percentage of students who study at the Autonomous University of Coahuila?

−   What differences of opinion exist between the age of 18 and 23, regarding the method of study?

−   What difference of opinion exists between the Eng. en Business Management and the Lic. in Business Administration, with respect to conventional attitudes?

Hypothesis

−   The largest student population is concentrated in the City of Saltillo Coahuila

−   The largest student population belongs to the Autonomous University of Coahuila

−   There are differences of opinion between the age of 18 years and 23 years, regarding the study method.

−   There is a difference of opinion between the Engineer in Business Management and the Lic. in Business Administration, with respect to conventional attitudes.

Theoretical framework

On the other hand, emphasis is placed on the AXIS of COVID-19, where, the World Health Organization (2021) is contemplated indicating that COVID-19 is a disease caused by SARS-CoV-2 mostly known as coronavirus which had its first report of contagion on December 31, 2019 in Wuhan China being reported as a case of pneumonia reason why it was handled as a known disease, until months later the cases of this disease increased exponentially. The name was given to the virus on February 11, 2020 by the World Health Organization while major efforts were underway to contain the outbreak in Wuhan.

In the same way, Flores (2022), expresses that even after the 12 weeks of incubation of the virus the sequelae can still be present and even some people have died from them. The sequelae range from chronic fatigue, headache, loss of the sense of smell and taste, but medical studies have shown that there is a great diversity of disorders in different organs. Finally, with regard to learning barriers, the Ministry of Public Education is visualized as sharing the following:

> "The term learning barriers is adopted rather than special educational needs, to refer to all the difficulties experienced by any student. Such barriers are considered to arise from the interaction between students and the contexts, people, policies, institutions, cultures, and social and economic circumstances that affect their lives."

Corrales, et. al (2017) comment that "learning barriers can be conceptualized as the presence of contextual factors that hinder or limit full access to education and learning opportunities"

Likewise, it is worth mentioning that virtual education has brought with it barriers and lags in terms of the development of digital skills in university students. Consequently, it is of vital importance to address through the perspective of scientific research these phenomena that are present in higher education.

According to ECLAC-UNESCO (2020) they establish that the essential conclusions they reach within the framework of their research are: "The COVID-19 pandemic exacerbated social inequalities, inequality and exclusion, while paradoxically transforming itself into an opportunity for the strengthening of social relations, guided by feelings of solidarity and collaboration around the search for the common good, and also by responsibility for the care of the other, as an essential dimension of one's care and survival.

In this scenario, and given the next stages of the pandemic and the phenomena or processes of future global crisis or with which we already coexist – such as climate change – it is increasingly common for the discourses of key actors to point out the need to rethink education, giving priority among the new contents to the preparation of students to understand reality, living together and acting in times of crisis and uncertainty, making decisions at the individual and family level and promoting collective solutions to urgent challenges that contribute to the structural transformation of the world.

In the document "Strategy of equity and inclusion in basic education" of the Ministry of Public Education (2018) it refers to three types of barriers in the pedagogical environment which correspond to:

1. "Attitudinal. Those related to the attitude of rejection, segregation, exclusion or overprotective attitudes of the actors who interact with the student (teachers of regular or special education, group mates, among others). These barriers include actions such as denial of enrollment or lack of inclusion in activities because they are not planned considering the characteristics and needs of the students. Likewise, when peers assume behaviors of overprotection, aggression or rejection, the participation of students in the classroom or in the school is limited.

2.   Pedagogical. They have in common that the conception that educators have about their teaching actions and learning practices do not correspond to the rhythm or style of learning of the students. For example, when the teaching is homogeneous or when the teacher does not offer the required supports for the students thinking that, if he does, the rest of the group will be delayed and will not cover the program. An example, referring to students with disabilities, is when the teacher plans for them activities of lower grades arguing that "they do not have the capacity" or that the activities are very complicated for the student. It should be noted that students with outstanding aptitudes may also face limitations when school activities do not respond to their pace or interests.

3.   Of organization. Barriers of this type refer to the order and stability in work routines, the application of standards and the distribution of space and furniture. For example, changes in rooms, spaces or activities without prior planning; when the materials are not accessible to the students, as well as environments of disorder within the classroom are factors that negatively affect the learning of any student; in the case of students with disabilities they become more serious because many of them need structure, stability and routines to achieve learning." (p.26)

It is worth mentioning Gómez (2017) whoalludes to five technological barriers that concern teaching-learning processes which are:

1. Cost.

2. Lack of training.

3. Resistance to adopting new technologies.

4. "Little technological development".

5. Insufficient infrastructure.

Methodology to develop

The research approach is quantitative as:

Part of an idea that is limited and, once established, objectives and research questions are derived, sources of information are reviewed, from which a framework or a theoretical perspective is built. From the questions, hypotheses are displayed and variables are determined; a plan is drawn up to examine them (design), the variables are measured in a certain context; the measurements obtained using statistical methods are analyzed, and a series of conclusions are drawn regarding the hypothesis or hypotheses. (Hernández, Fernández and Baptista, 2014, p. 4-5)

As for its design, it is transversal since it is an investigation that collects data in a single moment (Hernández, Fernández and Baptista, 2014, p. 154). Therefore, a single measuring instrument was applied, in order to explain the relative frequency of the axes of the research, so that an instrument was sent virtually through Google Forms, which covers a total of 128 reagents, of which 23 correspond to the general data and 105 are on a decimal scale of reason. It should be noted that the final instrument obtained an alpha of Cronbrach = 0.93, so the test satisfies the criteria of reliability and validity.

Due to its scope, the research taking into consideration the above:

1.   Exploratory. Exploratory studies are conducted when the goal is to examine a poorly studied, unknown, or novel research topic or problem.

In this sense, when analyzing the state of the art of the COVID-19 axis, it is characterized by being a topic in vogue and current, on the other hand, there is the axis of learning barriers, which there are very few reliable sources and indexed journals that comprehensively address this topic, therefore, the requirements to be an exploratory research are covered.

2. Descriptive. It consists of detailing and specifying the properties, characteristics and profiles of people, groups, communities, processes, objects or any other phenomenon that is subject to an analysis. That is, they only intend to measure or collect information independently or jointly about the concepts or variables to which they refer, that is, their objective is not to indicate how they are related. The above can be seen in that the present research aims to characterize the student sample with the signalitic variables according to the analysis of frequencies and percentages.

3. Explanatory. It is aimed at answering for the causes of physical or social events and phenomena. It focuses on explaining why a phenomenon occurs and under what conditions it manifests itself, or why two or more variables are related.

By its implication and methodical derivation is:

Comparative. It contrasts differences between opinion groups and variables on a numerical scale, according to the error probability criteria $p \leq 0.05$ and Levene test $p \geq 0.05$.

Results

Frequencies and percentages

1. There is a greater generalization in the female sex because they are those who are represented in a higher degree.

2. Students belonging to the age of 19 are the most represented.

Comparative analysis

In order to examine significant differences between the groups of the participating sample, the general data are analyzed in contrast to the complex variable referring to the *digital competences* of the *learning barriers* axis, from this, an analysis of means is carried out using the Student's T test for independent samples with a probability value of error less than 0.05 ($p<0.05$) also, the Levene test is performed, which is considered for the study of variances a value of $p<0.05$.

Comparative Age Analysis

It was found that a variable linked to learning barriers in the field of digital competences that presents a significant difference depending on their means in contrast to the signalitic variable age, in which there is a gap of opinion that is reflected in that 17-year-old learners, unlike 20-year-old students, manifest to a greater degree that *general information search sources such as Google, Yahoo, Bing, Ask,* etc., have represented a difficulty in their teaching-learning processes.

Consequently, it can be inferred that 17-year-old students demonstrate that one of their obstacles in their learning in times of pandemic has been the management of search engines for general knowledge and information on platforms such as Google, Yahoo, Bing and Ask, consequently, individuals in their 20s, according to their lowest average, are noted for further development in their virtual skills and capabilities in virtual education.

Therefore, H_1 is accepted for this analysis: there is a relevant difference between subjects aged 17 and 20 years in terms of the simple variable information search engines.

Comparative Analysis of Educational Modality

Relevant disparities are observed between the groups of students who adopt the face-to-face and online model that is verified according to the average of each sample. As for the subjects who study in a totally online dynamic from an educational platform, they present in greater proportion impediments to their school training such as: the *development with learning managers such as EMINUS, MOODLE, Blackboard, Joomla, Word Press* at the same time as the *delivery of academic tasks via digital.* As a result of the previous paragraph, it is inferred that learners who have a professional preparation in a 100% virtual panorama, in contrast to students who attend in person, have at a higher-level barrier in their learning which can be shown in the sending of online works and the use of learning managers, which are tools that provide support to facilitate pedagogical processes.

For the above reasons, the H₁ is accredited for this study: there are substantial differences between the groups incorporated in the virtual and face-to-face modality according to digital competences.

Comparative Analysis of Affective State in Confinement

It is also observed that there are dissimilarities of opinion between the subjects who outsource that they are finding the coexistence unpleasant and the students who express that they have been alone and have still done well, with respect to the latter are those who lead to a greater degree the arithmetic average, therefore, they have had to experience predominantly a barrier to their learning that alludes to *the management of file storage in the cloud* on different platforms that offer this function.

As a consequence, it follows that the students who, although they have been in a period of solitude in quarantine, responded that they have known how to handle it well, are those who reflect weaknesses in terms of virtual cloud storage, therefore, it has problems for the use of Dropbox, Google Drive, iCloud, among others. Once the statistical basis of comparison has been exposed, the working hypothesis is assumed that states that there are relevant differences in terms of virtual skills between students who have known how to cope well with confinement even when they are alone and students who go through negative environments of coexistence.

Conclusions

In this segment, the conclusions are presented as proposals and solutions to generate innovation and educational change in higher education. In order to achieve a transformation in the educational field, it is absolutely necessary to have a scientific basis, which provides reliability and validity to the proposals and contributions that are presented. The statistical analyses that were carried out throughout the research serve as a kind of diagnosis of needs, to build solutions in favor of quality and efficiency in education. Below are the intervention proposals that have as their main objective to benefit the student community, in order that they have a training that provides them with essential tools and knowledge to function effectively in the current context:

1. Renewal of the curriculum of university careers. If the curriculum of the different degrees and engineering of the Autonomous University of Coahuila is analyzed, there are subjects focused on the development of specific competencies in a certain disciplinary area, also, additional subjects are counted such as the 5 levels of curricular English and in certain degrees physical education plans, however, it is highlighted that a large part of the careers of the maximum house of studies especially those related to the Humanistic area, arts and social lack in their training subjects aimed at the promotion and strengthening of digital skills, abilities and capacities. Therefore, the proposal is extended to the staff in charge of the design of plans and study programs to integrate into the curriculum subjects focused on raising and potentiating digital skills for mastery and specialization in:

–   General information search engines.

–   Cloud file storage.

–   Virtual platforms.

–   Office 365 Pack.

–   Creating and editing multimedia content.

–   Identification of main indexed journals.

In the same way, the results of the research showed that students manifest themselves with apathetic attitudes, discouragement and indifference in their educational environments for which, it is also recommended to insert subjects focused on stimulating and intensifying to the maximum degree a stable emotional health, in balance and harmony, which in turn to be a trigger in the quality of learning.

2. Another proposal for educational change is to involve mothers and fathers more in different cultural, artistic, academic and sports activities in which their children participate, since, in the results, tutors in the family context denote disinterest, violence and detachment with their children. Also, it is important to open up talks and workshops in which father and son participate to strengthen their affective and communication ties. All of the above may be a watershed in favor of university education.

3. Enabling spaces and a modern infrastructure for the management and exploration of digital tools, in which training programs that are practical, interactive and dynamic can be opened to maintain active learning in the student.

4. Generation of leisure activities of interest to students in each faculty to continue reinforcing emotional health.

5. Give greater promotion to the tutoring program of the Autonomous University of Coahuila.

6. Creation of an academic and psychological guidance department in each faculty to improve academic performance, as well as for the student to feel accompanied and emotionally supported.

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