

# Variables Affecting Academic Performance In University Admission Tests And Desertion

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## Abstract

A documentary review was carried out on the production and publication of research papers related to the study of academic variables that affect academic performance in university entrance tests and desertion. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2016-2021, achieving the identification of 117 publications in total. The information provided by the said platform was organized through graphs and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics were described, the position of different authors regarding the proposed topic was referenced by employing a qualitative analysis. Among the main findings of this research, it is found that the United States, with 51 publications, was the country with the highest scientific production registered in the name of authors affiliated with institutions of that country. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material referring to the study of the Academic Variables that Affect Academic Performance in University Admission Exams was Social Sciences with 68 published documents, and the Type of Publication that was most used during the above-mentioned period was the Journal Article, which represents 82% of the total scientific production.

**Keywords:** University Admission Exams, Academic Achievement, Factors, Desertion.

## 1. Introduction

Higher education is the educational level that prepares professionals with knowledge that promotes meaningful learning in a specific area of knowledge. This education is divided into two levels, undergraduate, which includes the technical, technological and professional

levels, and graduate which are higher levels of knowledge specializing in a professional branch of the field of study. Although admission exams for higher education institutions are not globally implemented, they are very common, to determine the student's aptitude and basic knowledge in the field of knowledge in which he/she wants to

specialize. These exams are implemented mainly due to the massification of university students since in the last decades this number has tripled, being higher education much more demanded, which has given way to new university institutions.

Some universities require only a knowledge test, others implement interviews or letters of recommendation to grant a place on their campus. In these admission tests, certain factors determine the success of a student in its completion, the main factor is the previous knowledge obtained in basic education, and at this point enters the discrepancy that is seen, usually in Latin America, between the knowledge granted in basic education and the knowledge required in higher education, presenting deficiencies in the basic knowledge.

This factor is determined by the nature of the basic education from which the student graduates since it must be taken into account whether it is public or private and the qualification criteria applied, as this is very important when measuring a student's progress. This factor is a determining factor in the academic performance of applicants to higher education since the admission exam usually measures basic competencies that are obtained in middle school or high school. Another determining factor in the academic performance in the university admission tests is the student's vocation and aptitude for the field of study since the student has a much better grasp of the knowledge to which he/she is related, so if the field of knowledge to which he/she applies is not his/her first choice of study, this can have an impact on his/her performance in the admission exam. Finally,

there are secondary factors such as the psychological, family and social context of the applicant, which can determine whether or not the student is admitted to the professional career in which he/she wishes to be trained. For this reason, to ensure that students meet the basic requirements in general knowledge necessary to start a professional career, admission tests are increasingly common in universities, allowing the identification of the shortcomings with which students graduate from basic education.

## **2. General Objective**

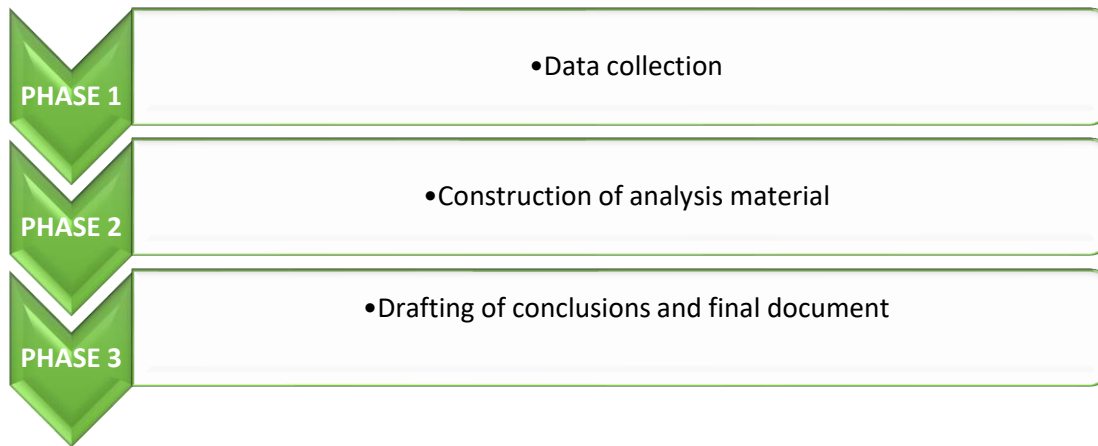
To analyze from a bibliometric and bibliographic perspective, the production of research papers concerning the study of academic variables that affect academic performance in university entrance exams during the period 2016-2021.

## **3. Methodology**

Quantitative analysis of the information provided by Scopus is performed under a bibliometric approach to the scientific production related to the study of the Academic Variables that affect Academic Performance in University Admission Exams. Likewise, examples of some research works published in the area of the study mentioned above are analyzed from a qualitative perspective, based on a bibliographic approach to describe the position of different authors on the proposed topic.

The search is carried out through the tool provided by Scopus and the parameters referenced in Figure 1 are established.

### **3.1 Methodological design**



**Figure 1.** Methodological design

**Source:** Own elaboration

### 3.1.1 Phase 1: Data collection

Data was collected through the Scopus web page search tool, through which a total of 38 publications were identified. For this purpose, search filters were established, consisting of:

- ✓ Published papers whose study variables are related to the study of Academic Variables Affecting Academic Performance on University Entrance Exams.
- ✓ Without distinction of countries.
- ✓ Without distinction of area of knowledge.
- ✓ Without distinction of type of publication.

### 3.1.2 Phase 2: Construction of analysis material

The information identified in the previous phase is organized. The classification will be made through graphs, figures and tables based on data provided by Scopus.

- ✓ Word Co-occurrence.
- ✓ Year of publication
- ✓ Country of origin of the publication.
- ✓ Area of knowledge.
- ✓ Type of publication

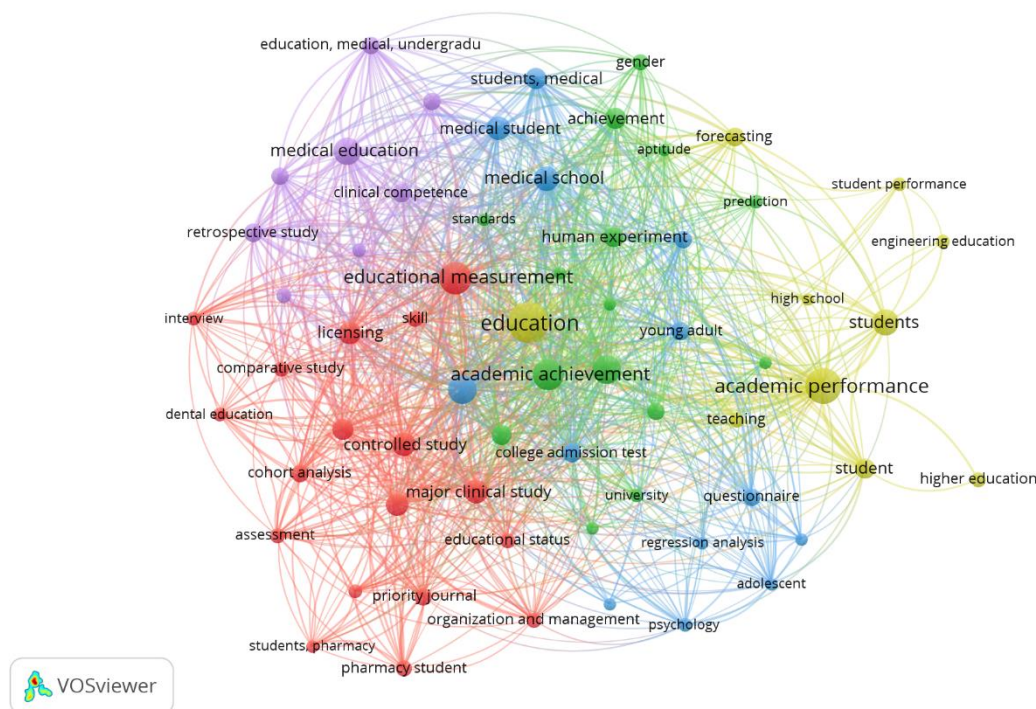
### 3.1.3 Phase 3: Drafting of conclusions and final document

After the analysis is carried out in the previous phase, the conclusions are drawn up and the final document is prepared.

## 4. Results

### 4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.



**Figure 2.** Co-occurrence of words

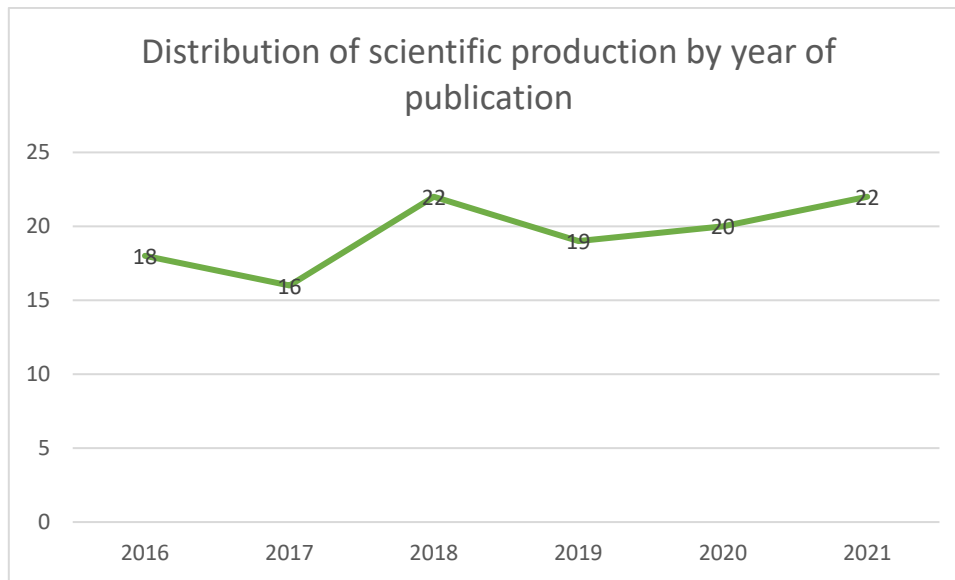
**Source:** Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 1, the keyword with the greatest use in the research related to the variables under study is education, which refers to the process of formation of the students that goes from the basic level of general knowledge to the higher level of specialized knowledge in a field of study, these being elementary school, junior high school, high school, undergraduate and postgraduate education. Keywords such as academic behavior, students and higher education are found, determining that the research discusses how academic performance in basic education influences applicants to higher education, which is very important since it gives the applicant the basic general knowledge of all areas of knowledge, and therefore determines their performance in admission exams. On the other hand, keywords such as standards, educational

measurement, admission criteria of educational institutions and aptitude tests, shed light on the process carried out by universities when they set the criteria to be evaluated for the admission of students. These criteria are usually under international standards, complying with the quality objectives of the educational institution, and ensuring that students entering the university have the skills and knowledge necessary to complete all levels of undergraduate education.

#### 4.2 Distribution of scientific production by year of publication.

Figure 3 shows how the scientific production is distributed according to the year of publication, taking into account the period from 2016 to 2021.



**Figure 3.** Distribution of scientific production by year of publication.

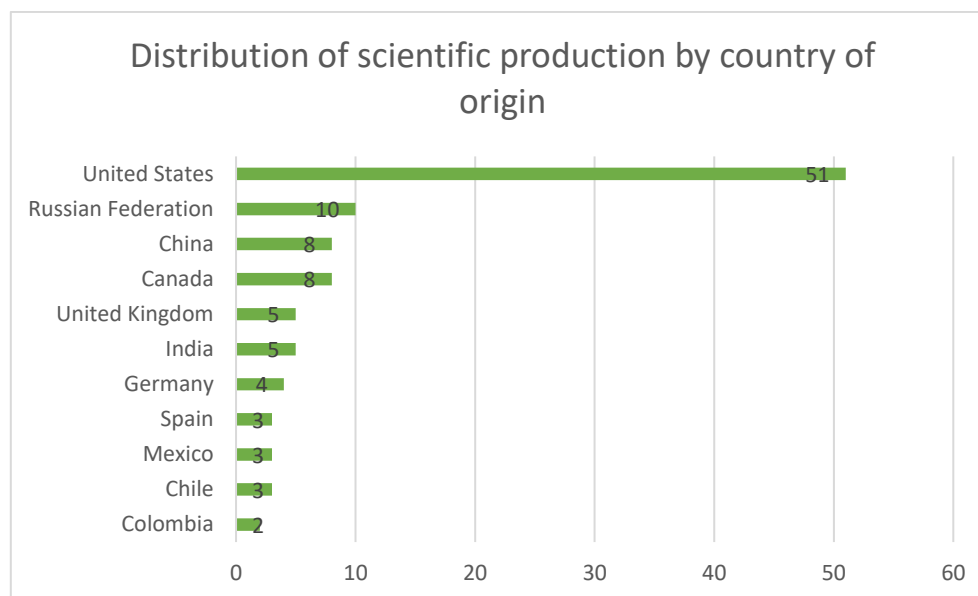
**Source:** Own elaboration (2022); based on data provided by Scopus.

In the research related to the variables under study, it was found that in the years 2021 and 2018, a greater amount of research material was registered presenting 22 documents in each one, in the documents belonging to 2021 is "Admission and academic selection in upper secondary education in Mexico" (Hernández-Fernández, 2021). The main objective of this document is to determine whether the use of admission exams or simple admission promotes a differentiated academic composition in upper secondary school (USS) in Mexico. This study was conducted through the analysis of PISA 2012 statistics where it could be determined that simple admission does not seem to promote more egalitarian educational transitions for students with different academic performances, demonstrating that an entrance exam does not guarantee universities that students can adapt to the higher education system and satisfactorily complete undergraduate education.

On the other hand, in the documents found in 2018, one can identify "Predictors of student success in Higher Education: Internal high school scores versus national exams" (Cerdeira et al., 2018). This paper aims to investigate the relative predictive power of students' performance in school and the scores obtained in national exams on the academic performance of students in Higher Education. The paper evidenced that the scores awarded by teachers in high school are better predictors of subsequent performance than the scores of entrance exams since they are more in line with the understanding of the topics and the assimilation of learning styles and tools.

#### 4.3 Distribution of scientific production by country of origin.

Figure 4 shows the distribution of scientific production according to the nationality of the authors.



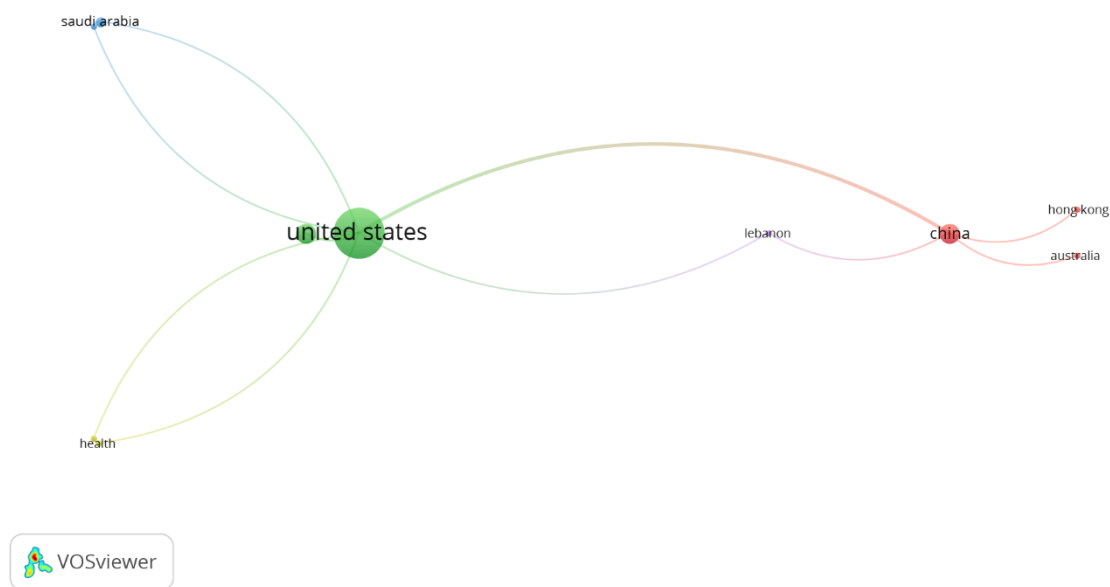
**Figure 4.** Distribution of scientific production by country of origin.

**Source:** Own elaboration (2022); based on data provided by Scopus.

The United States is the country with the largest bibliographic volume concerning variables in studies and its related, presenting 51 papers within which one can find the title "Differences in predictors of academic success using multi-year and individual student admission data" (Eiland et al., 2018), which aims to determine predictors of academic performance of students taking into account their results and by year, so the three-year student admission data were compared with the results of selected students to identify predictors of the success of applicants, so a study was conducted with 417 students, where it was had as very varied results of academic performance factors, so it is recommended schools should perform multi-year and

individual years analysis to determine the predictors of academic success.

At this point, it should be noted that the production of scientific publications, when classified by country of origin, presents a special characteristic, which is the collaboration between authors with different affiliations to public and private institutions, and these institutions may be from the same country or different nationalities so that the production of an article co-authored by different authors from different countries of origin allows each of the countries to add up as a unit in the general publications. This is best explained in Figure 4, which shows the flow of collaborative work from different countries.



**Figure 5.** Co-citations between countries.

**Source:** Own elaboration (2022); based on data provided by Scopus.

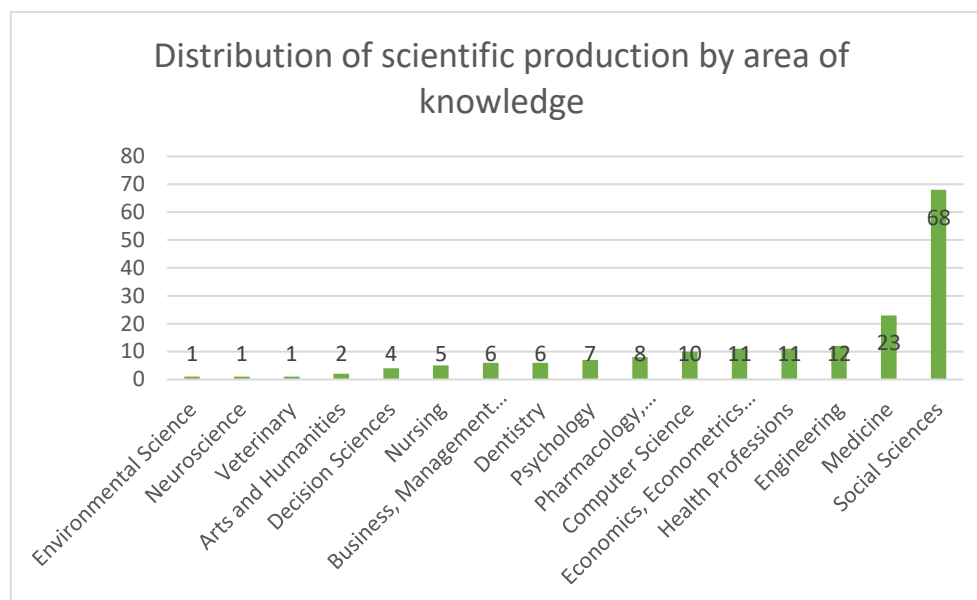
As mentioned above, the United States is the country with the highest number of scientific production with Academic Variables that affect Academic performance in university entrance exams having papers in collaboration with authors affiliated to institutions belonging to China and Saudi Arabia mainly, to present an overview of these variables adapted in each social context. In second place is The Russian federation with 10 papers, among which is the paper entitled "Admission to universities as a risk factor of human resources in the modernization of Kuzbass mono-cities" (O. A, 2018), This document aims to determine how the admission processes affect the competition between universities since to attract the best and most talented applicants, it is necessary to improve the competition of regional universities and

the implementation of institutional measures, so in the analysis of these processes, it was found that this causes that the universities are not so well received. Therefore, it is concluded that to attract the best and most talented applicants, it is necessary to improve the competition of regional universities and the implementation of institutional measures to prevent students from emigrating, leaving the community without valuable actors of change by not being trained in that environment.

#### 4.4 Distribution of scientific production by area of knowledge

Figure 5 shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are carried out.





**Figure 6.** Distribution of scientific production by area of knowledge.

**Source:** Own elaboration (2022); based on data provided by Scopus.

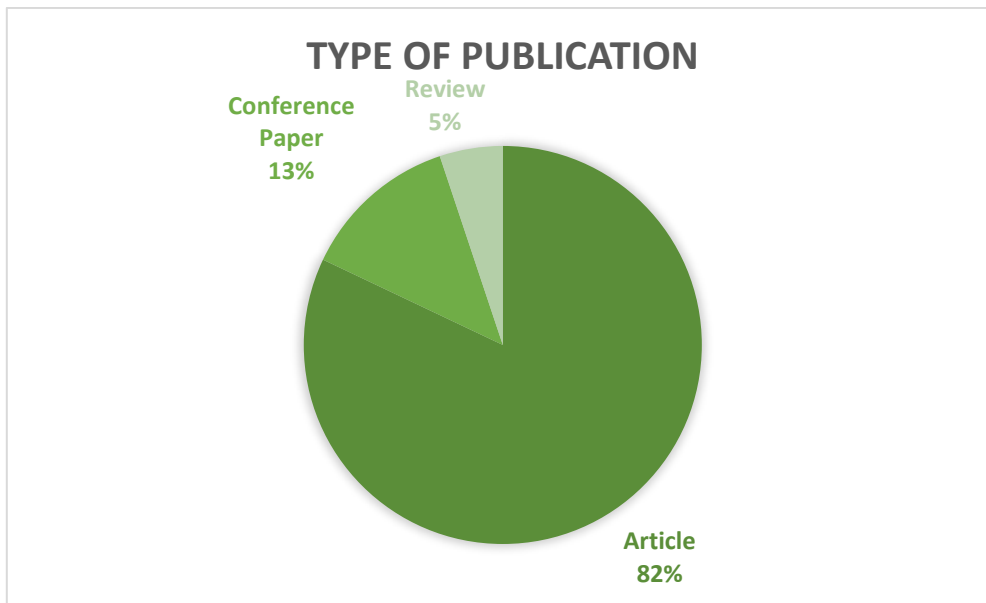
Social sciences were the area of knowledge with the greatest influence at the time of carrying out research concerning the study of Academic Variables that affect academic performance in university Admission Exams, presenting 68 documents, within which is the title "Characterization of academic programs and determination of the variables that affect the performance of students at the Colegio de Estudios Superiores de Administración, CESA" (Cayón et al., 2021). This document has as its main objective to identify the variables that affect academic performance and therefore can predict academic desertion. In this study, the results of 866 undergraduate students and 189 graduate students were analyzed identifying that the variables that determined the academic performance of students are the type of high school where the student came from, their performance in the national entrance exam and a good performance in the process of entering the university mainly.

In second place is Medicine where 23 documents were written following the guidelines of the subjects related to that area, within these documents is "Admission criteria for Canadian dental hygiene programs" (Shahab et al., 2021). This document aims to understand the variation in admission criteria for Canadian dental hygiene programs and to determine if the criteria are appropriate for predicting a program's success rate on the National Dental Hygiene Certificate Examination (NDHCE), so a review of the academic variables taken into account in the admission processes of 29 of 30 dental hygiene programs was conducted, which resulted in academic performance as an admission criterion, including overall GPA/prerequisite, being the most common criterion used by dental hygiene programs

#### 4.5 Type of publication

Figure 7 shows how the bibliographic production is distributed according to the type of publication chosen by the authors.





**Figure 7.** Type of publication

**Source:** Own elaboration (2022); based on data provided by Scopus.

As Figure 7 shows, within the different types of publications, 82% of the total number of documents identified through Phase 1 of the Methodological Design, correspond to journal articles, within which is the one entitled "Correlation between Advanced Dental Admission Test Performance and Dental MATCH Success" (Dee et al., 2021). This paper presents its main objective to evaluate the impact of Advanced Dental Admission Test performance on the MATCH success of students in a postdoctoral pediatric residency program, in this, a minimal association was found between ADAT scores and MATCH status. All this means that the admission exam is not the main variable to measure the good performance of students during their career, but it does demonstrate the deficiencies with which students graduate from elementary and high school, having little or no effect on the student training process.

In second place are the conference proceedings which represent 13% of the total of the documents registered in this study,

within these is the title "Comparative study of Regression Models for the prediction of graduate admissions using Machine Learning Techniques" (Sapare & Beelagi, 2021). This document through a study allows proposing a model to predict the probability of admission from the analysis and regression models where they are used to predict the possibility that students are admitted to the university of their interest based on their graduate performance and thus determine the factors that influence their admission to higher education and how this determines the academic performance during the time of the study, taking into account the good bases obtained from basic and undergraduate education.

## 5. Conclusions

Thanks to the bibliometric analysis carried out in this article, it is possible to determine that the main characteristics in the volume of scientific production referring to the study of the Academic Variables that Affect Academic Performance in University Entrance Exams are low, especially in Latin American

countries. It is established that the United States was the country with the highest number of reports through its institutions to Scopus with a total of 51 documents registered during the period 2016-2021. Due to the nature of the study, which seeks to Determine the Academic Variables that Affect Academic Performance in University Entrance Exams. It is established that Social Sciences was the area of knowledge with the greatest influence in the research identified, since 68 of the 117 publications related to the present analysis, actively participate with theories framed in that area of knowledge. Similarly, and following the nature of the study and the educational component, Medicine also played a fundamental role in the execution of 23 publications. It should be noted that within the analysis presented regarding the position of different authors in the study of the topic proposed in this research, it can be concluded that the variable that most affects academic performance in university admission tests is the basic educational institute from which they graduated since its nature can determine the levels of excellence it offers and the ability of students to acquire basic skills that determine their success in the admission tests, so more documents are needed to determine how these variables are currently used. However, it is expected that from bibliographic and bibliometric reviews such as the one proposed in this document, the current situation of the literature on the subject is taken into account and that educators and the educational community help in the generation of new knowledge, to have more scientific material to determine the Academic Variables that Affect Academic Performance in University Admission Exams.

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