


Analyzing the Relationship between Scientific Publications and Researchers' Variables: A Scopus-Based Study of a Private Ecuadorian University

Yasmany García-Ramírez

Universidad Técnica Particular de Loja, Ecuador,  <https://orcid.org/0000-0002-0250-5155>

Abstract: Research enables progress in science. Scientific publications are one of the means used to share the advances found in research. Ecuador has had a substantial increase in its scientific production in recent years. In this context, the article aims to examine the relationship between scientific publications and variables of Ecuadorian researchers using the affiliation of the Universidad Técnica Particular de Loja (UTPL). For this purpose, the Scopus® database was analyzed from 2010 to 2022. The growth in the number of publications started mainly due to state legislation, which mandated the need to publish research. This decision led to an increase in research being conducted in academia. The different groups analyzed showed differences; therefore, the university should have a differentiated strategy for each group. The procedure detailed in the article can serve as a reference for other institutions or for those who wish to evaluate the performance of their faculty. Publications bring prestige to both faculty members and institutions, but the main focus of research should not be lost.

Keywords: Scientific publications, University, Scopus, Productivity, Ecuador.

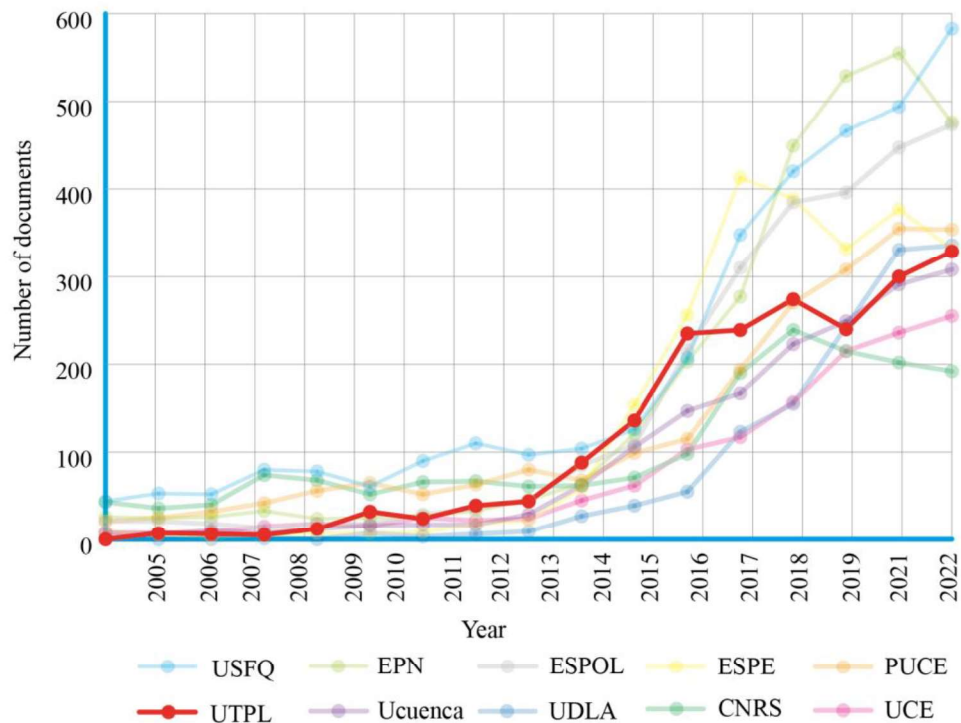
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Introduction

Research is essential for advancing science, and one of its main outcomes is scientific publications, which are crucial for researchers to engage with the academic community and advance their careers. Institutions are ranked based on academic or research performance, which includes factors such as highly cited researchers, articles published and/or indexed by major citation indexes, and performance per capita (Liu & Cheng, 2011). However, simply increasing the number of faculty members may not necessarily increase publications per capita, and the impact of this increase may vary across different departments (Epstein & Menis, 2013). Publications and their citations are important measures of the quality of scientists (Vavryčuk, 2018). Moreover, professors who are more involved in research tend to achieve better results in their teaching evaluations (Artés et al., 2017), leading institutions to favor publications, often through university legislation or incentives. These

changes have been driven by certain countries, such as Ecuador, where there has been a significant increase in scientific publications in recent years.

According to Scopus®, Ecuador had 300 publications indexed in 2005, and this number progressively increased to 6,594 in 2022 (Scopus, 2022a). This growth was mainly due to legislation that required higher education institutions to allocate at least 6% of their budget to indexed publications, scholarships, or research projects (*Ley Orgánica de Educación Superior (LOES) - Registro Oficial Suplemento 298*, 2010). Additionally, the legislation on the university teacher career and ranking gave greater relevance to scientific publications (*Reglamento de Carrera y Escalafón Del Profesor de Educación Superior - Resolución RPC-S0-037 No.265*, 2012, 2012). These changes led to an increase in registered publications annually, as shown in Figure 1.



Universidad San Francisco de Quito (USFQ), Escuela Politécnica Nacional (EPN), Escuela Superior Politécnica del Litoral (ESPOL), Universidad de las Fuerzas Armadas (ESPE), Pontificia Universidad Católica del Ecuador (PUCE), Universidad Técnica Particular de Loja (UTPL), Universidad de Cuenca (Ucuena), Universidad de las Américas (UDLA), Centre National de la Recherche Scientifique (CNRS), Universidad Central del Ecuador (UCE).

Figure 1 Historical publications (2005-2022) registered in Scopus for the top 10 scientific production institutions in Ecuador in 2022

The most significant growth in the Figure 1 is observed from 2013 onwards for all universities. Higher education institutions established their own regulations based on state laws, such as the Universidad Técnica Particular de Loja, which included its internal regulations in 2015, incentivizing publications (*Reglamento*

Interno de Carrera y Escalafón (N°012.012.2015), 2015). A study found that 51% of respondents said they had changed their behavior due to the way they are evaluated (Abbott et al., 2010). A ranking and evaluation system for researchers can contribute to overall improvements in scientific capacity in low- and middle-income countries (Fry et al., 2023).

The UTPL, which is ranked sixth in indexed publications according to Scopus, has regulations that prioritize research and assign academic dedication and the number of research hours a professor can have based on their role in the institution (*Instructivo Para La Asignación de Dedicación Académica al Personal de La UTPL (VIN_IN_6_2020_V2_2022)*, 2022), as shown in Table 1. Each profile has mandatory teaching hours, while the amount of time dedicated to research, supervision of degree projects, and management varies depending on the profile.

Table 1 Detail of the profiles considered in the internal policy of UTPL.

University member	Profile	Hours of			
		Teaching	Research	TT	Management
Rectors and Vice-Rectors	1A	4	-	-	36
Deans, Associate Deans, Directors, and Assistant Directors of academic units	1B	8	4	2	26
Directors and individuals associated with the organization of the UTPL	1C	8	4	2	26
Heads of departments, degree programs, or academic programs.	1D	16	4	2	18
Professor-researcher	2A	18	18	4	-
	2B	25	11	4	-
	2C	30	6	4	-
Professor	3A	32	-	8	-
	3B	20	-	According to contract	-
	3C	>19	-	According to contract	-

TT: Supervision of degree theses - does not have hours allocated for this function.

This article aims to examine the relationship between scientific publications and the variables of Ecuadorian researchers affiliated with the Universidad Técnica Particular de Loja (UTPL) in the context of the rapid increase in Ecuadorian scientific production. The growth in publications should not only be for the prestige of universities but also for the essential function of research in improving society. To conduct this analysis, we utilized the Scopus® database from 2010 to 2022 and used the UTPL as the average institution among the top

10 institutions with the most publications in 2022. While our analysis focuses on the UTPL, the methodology can be applied to other institutions with similar objectives. The sustainability of this growth in scientific publications is crucial for the long-term benefits of research and its impact on society.

Methods

In this section, we will explain the methodology that we followed to achieve the proposed objective. We will start by describing the details of the university that we analyzed and then provide an explanation of the data collection process. After that, we will provide details on the data processing steps that we took. Finally, we will discuss the variables that we used in the analysis.

Details of the University Under Analysis

The university analyzed in this study is UTPL, located in the southern region of Ecuador, which offers higher education in a variety of formats including on-campus, virtual, and distance learning. Currently, UTPL provides undergraduate and graduate programs in various fields, such as engineering, health sciences, social sciences, and education. The university employs 733 full-time teachers and over 1,000 part-time teachers, and has a student body of approximately 43,000 students, of which 6,000 are enrolled in on-campus programs (Carrera, 2022). The majority of virtual or distance learning students are located throughout Ecuador, while on-campus students primarily come from the surrounding areas of the university campus in Loja. UTPL places a strong emphasis on research, as demonstrated by its policies and regulations that encourage and reward faculty members for their research activities. The UTPL is the average institution among the top 10 institutions that published the most in 2022, based on the number of publications indexed in Scopus.

Data Collection

To collect data on scientific publications by researchers affiliated with the UTPL, the institution used the Scopus® database from 2010 to 2022, with the Affiliation ID of 60072064 (Scopus, 2023). Until march 2023, this database contains information on 2422 indexed documents and 1512 authors and co-authors affiliated with UTPL. The year 2010 was chosen as the starting point due to the enactment of a state law that year. The data collected includes the title, authors, year of publication, journal or conference name, and number of citations, among other available information in Scopus.

Data Processing

Several filtering and correction processes were applied to the initial database.

- It was initially observed that some authors had multiple profiles in the database, which was attributed

to errors in the indexing process. The errors included listing given names in place of surnames or listing the second surname instead of the first surname. To address this issue, the profiles for each author were unified, although this task was time-consuming and may have affected the accuracy of indicators. For instance, an author might have n articles in one profile and different data in another profile, which were combined into a single profile. Additionally, 210 profiles were found to be incorrectly associated with university faculty members. The Mean Absolute Percentage Error (MAPE) for the entire database was calculated to be 9.15%.

- Next, the database was further processed by removing profiles of individuals who were not affiliated with the university's staff on a full-time basis. Although external collaborators, students, and technicians may have supported research and appeared as authors or co-authors, they no longer actively participate in research after that collaboration. As a result, the database was reduced to 489 professors who are currently employed by the university and are directly responsible for scientific production.
- These 489 professors were then organized into six groups based on quartiles and percentiles. Percentiles were used because the first quartile was divided into three groups in order to analyze the variation within the group. Each of these groups was assigned a main characteristic as seen in table 2.

Table 2 Distribution of the research groups for this study

N° of group	Quartile	Percentile	N° of documents	Characteristic
1	4	25	≤ 1	People who are starting with peer-reviewed research would need greater support both in the research process and in writing the manuscript.
2	3	50	$1 < a \leq 4$	
3	2	75	$4 < a \leq 10$	People who already know the research and writing process don't need more support than the time available to research. They will continue to increase their metrics. They need support to ensure that their desire to research doesn't diminish.
4	1	85	$10 < a \leq 15$	
5		95	$15 < a \leq 30$	People who already know the research and writing process do not need more support than the time available to conduct research. They possibly have a consolidated team. They need support to maintain their desire to research and not let it diminish. They need stable contacts and workgroups.
6		-	> 30	

- Next, the profiles were linked to the teaching positions they hold at the university.

Variables Analyzed

The variables analyzed in the study are presented in Table 3. They include variables related to the number of publications, the impact of publications measured through Field-Weighted Citation Impact (FWCI), co-authors, and teaching profiles of the authors. Notably, the H-index has not been included as a variable since it may not accurately reflect the quality of individual publications due to variations in the number of citations in different fields or types of publications. Moreover, the h-index can be influenced by other factors such as the researcher's age and the field of study (Mohammed et al., 2021).

Table 3 Definition of the variables used in the analysis

Variable	Definition
Total number of publications	It is the number of publications that the author has registered in Scopus
Average annual documents	It is the average number of all documents published by an author in a given year.
Average annual citations per article	It is the total number of citations that an article has received in a given year.
Average annual articles	It is the number of articles published in a journal in a given year.
Average annual conference papers	It is the number of papers published in a conference in a given year.
Average books or book chapters:	It is the average number of books or book chapters authored or co-authored by an individual in a given year.
Weighted Average Field Citation Impact (FWCI)	It is a measure of the average impact of a publication in a specific field, considering the number of citations it has received relative to the expected number of citations for other publications in the same field. This metric is calculated by dividing the total citations of a set of publications by the total expected citations for those publications based on the citation patterns of other publications in the same field, and then normalizing the result to 1.0 as the average for the field (Scopus, 2022b). This metric was obtained from Scopus. The average value was calculated for each author, based on the period from 2017 to 2021, which is the period available up to the present date.
Fields with Highest FWCI	These are the fields where the documents have had the highest FWCI values.
Number of Fields	It is the number of different fields in which an author's articles have been published and cited.
% of FWCI ≥ 1	It is the percentage of fields where the FWCI was greater than or equal to 1.

Year of Scopus Entry	It is the year when the author indexed their first article in the Scopus database.
% as First Author	It is the percentage of an author's articles where they appear as the first author.
Average number of coauthors	It is the average number of coauthors that articles by a certain author have
Professor profile	It is the profile that UTPL has assigned to the teacher during the year 2023. It can be: 1A, 1B, 1C, 1D, 2A, 2B, 2C, 3A, 3B, 3C

Results

The results have been organized into 4 sections. In the first part, the quantity of publications and their citations were analyzed. This can be useful for evaluating the productivity and impact of an author or group of authors in a specific research field. In the second part, the relationship between the study's results and the FWCI of the journals in which the works were published was investigated. The FWCI is a measure that indicates the relative importance of a journal in a specific field and can be useful for evaluating the quality and relevance of publications. The third part focused on collaborations between authors in the documents. This can be useful for evaluating collaboration and teamwork ability of authors, as well as identifying trends in collaborations within a research field. In the fourth and final part, the relationship between the number of annual publications and some variables of the authors, such as their teaching profile, was analyzed. This can be useful for better understanding the conditions and factors that influence the productivity of authors in a specific research field. Overall, these results can be useful for evaluating the productivity and impact of an author or group of authors in a specific research field, as well as for better understanding the trends and factors that influence productivity in that field.

Publications and Citations

The number of people in each group were: Group 1 (128), Group 2 (131), Group 3 (111), Group 4 (46), Group 5 (50), and Group 6 (23). Figure 2 shows that there are significant differences in the average number of publications and citations between the different groups of authors. It also indicates that the groups with a higher number of publications are more likely to have a higher number of citations. Additionally, the graph highlights the increasing trend in the number of publications and citations for all groups, except for a decrease in average publications per author for the groups producing the most in 2021 and 2022. As for the average number of citations, it is expected to have a downward trend as articles usually do not get cited immediately after they are published. The graph also shows that conference papers have a higher average number of publications than journal articles, and there has been a significant increase in conference papers for Group 6 starting from 2015. Conference papers may have a higher number of citations than journal articles considering a two-year period (Chen & Konstan, 2010), although others have found the opposite (Garousi & Fernandes, 2017). Another element to consider is that professors might have found an advantage in advancing through the hierarchy of academia by publishing conference papers that were quicker and easier to publish than journal articles (Purnell,

2019). Group 6, which publishes the most, has the greatest dispersion of the data.

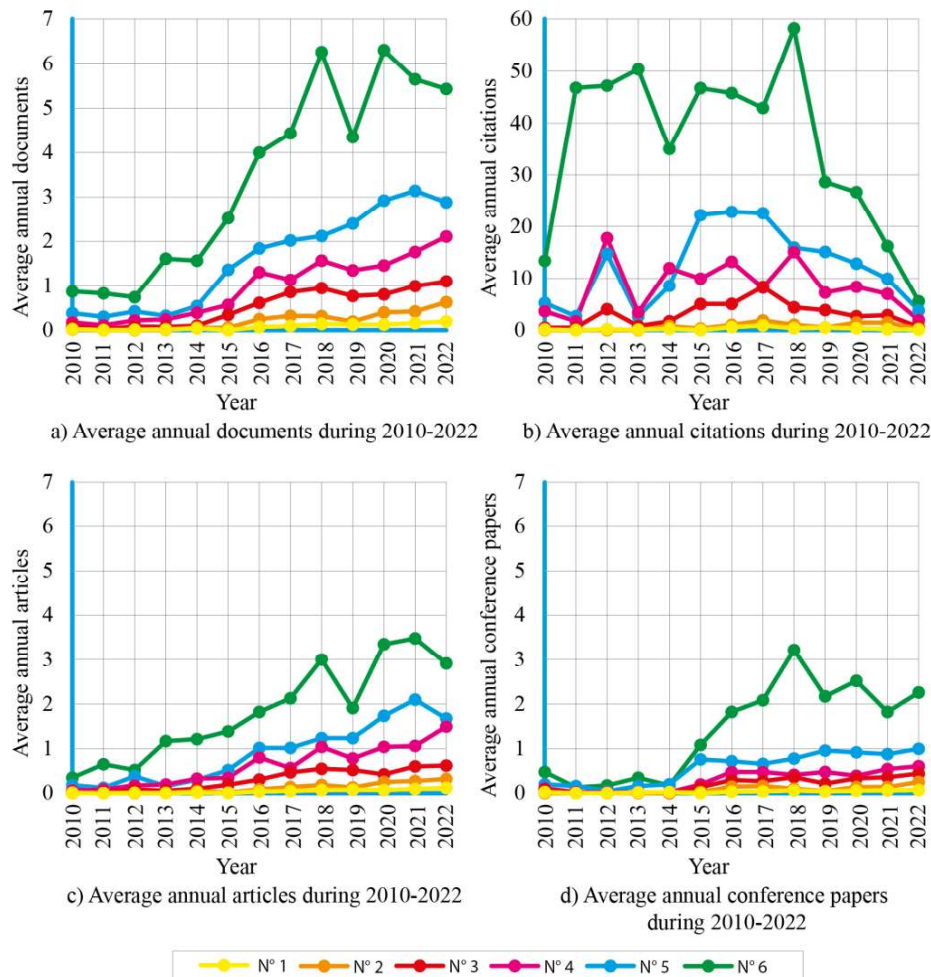


Figure 2 Publications and author citations for each group of professor during the period 2010-2022.

Finally, books and book chapters are produced in smaller proportions than scientific articles and conference papers, with Group 6 having the highest proportion of books and book chapters among all the groups. However, the same trend as the other graphs remains, with group 1 publishing the least of these documents and group 6 having the highest value, although there is some similarity between group 3 and 4. The maximum value in all years is as follows: No. 1: 0.01, No. 2: 0.02, No. 3: 0.09, No. 4: 0.07, No. 5: 0.12, No. 6: 0.17. Overall, these results provide useful insights into the productivity and impact of authors in different research fields.

Field-Weighted Citation Impact (FWCI)

The Field-Weighted Citation Impact (FWCI) and contribution areas are shown in Table 4. Based on the FWCI values, groups 3 and 4 have a higher impact than the other groups, indicating that their publications are being

cited more than expected in their respective fields. However, these groups also have a high confidence interval, which suggests that there is more variability in their impact. On the other hand, groups 5 and 6 have lower FWCI values, but they also have lower confidence intervals, indicating that their impact is more consistent. Group 2 has the lowest FWCI values and the highest confidence interval, which suggests that their impact is not significant in their respective fields. It should be noted that the number of contributions can influence the FWCI values, and since groups 5 and 6 have a greater number of contributions, their impact may be overestimated. Overall, the FWCI values suggest that groups 3 and 4 have a higher impact, but further analysis is needed to determine the significance of these findings.

Table 4 Results of FWCI 2017-2021 for the analyzed groups

Group	FWCI		Contribution areas	
	Average	IC95	Average	% of FWCI ≥ 1
1 (≥ 1 document)	-	-	-	-
2 ($1 \leq 4$ documents)	0.69	2.42	1.54	32.12
3 ($4 \leq 10$ documents)	1.02	1.38	3.52	46.24
4 ($10 \leq 15$ documents)	1.03	0.73	5.52	41.25
5 ($15 \leq 30$ documents)	0.95	0.35	8.96	38.37
6 (>30 documents)	0.96	0.22	16.00	37.50
- It was not possible to determine due to having only one contribution per author. FWCI: Field-Weighted Citation Impact. 95% CI: 95% confidence interval.				

Interdisciplinary research has become increasingly important in academia, as it allows for a broader understanding of complex problems and the development of innovative solutions. The finding that group 6 has contributed to a larger number of areas (16) on average compared to the other groups suggests that they may be more interdisciplinary in their research approach. This could be a strength for group 6, as it allows for the integration of different perspectives and methodologies to solve problems. Additionally, the similar percentage of documents with an FWCI value greater than 1 across all areas suggests that the impact of research is not necessarily dependent on the specific field it is in. Rather, it is the quality and relevance of the research that determine its impact, regardless of the area of study. This highlights the importance of collaboration and knowledge exchange across different fields and disciplines to advance research and make meaningful contributions to society.

Regarding the areas that have had a higher FWCI value, a word cloud was created and is shown in Figure 3. One of the first impressions is that the groups organized by the number of publications seem to have different areas of focus. Group 2 focuses mainly on topics related to "learning and management" ($N=7$) while group 3 focuses on "learning and education" ($N=13$, $N=9$) group 4 on "social, ecosystem and environmental" ($N=6$, $N=5$, $N=5$) group 5 on "social and media" ($N=11$, $N=6$) and group 6 on "internet" ($N=4$). It is important to note that the term "learning" or related to appears in almost all groups, which could be attributed to one of the main functions of a professor.



Figure 3 Word cloud of the areas with the highest FWCI values for each analyzed group

Document Collaboration

The trend of younger researchers and those in lower academic ranks to appear as first authors in research articles

is well-documented (Costas & Bordons, 2011). Therefore, the percentage of times an author appears as the first author in their articles was calculated. A higher percentage means that they appear more often as the first author than a lower percentage. Percentages were counted for all authors in four groups: 0-25%, 25-50%, 50-75%, 75-100%. The results are shown in Figure 4. It can be observed that researchers in group 6 have a low percentage of first authorship, which suggests the interdisciplinarity found previously. On the other hand, group 5 has a higher percentage of first authorship than the previous group, similar to group 4. Group 3 has the highest percentage of first authorship in up to 50% of the articles in that group. Group 2 has a high score between 25 and 50% of the articles in that group, then decreases before increasing again. Group 1 has a high percentage of first authorship in 75-100% of their publications, indicating a possible lack of collaboration with other researchers at the university.

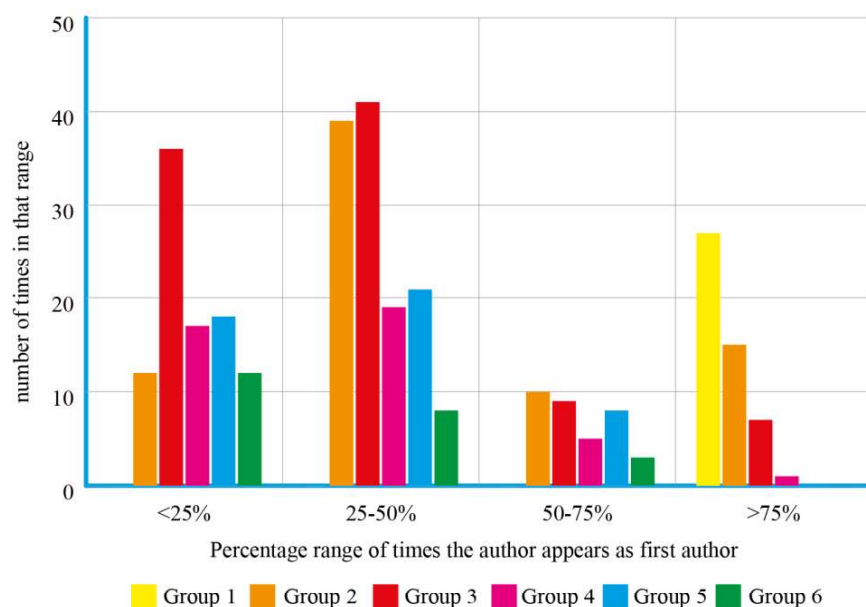


Figure 4 Number of times the percentage of times the author appears as the first author is between 0-25%, 25-50%, 50-75%, 75-100% for each group under study.

The relationship between the average number of researchers who appear in the documents and the total number of publications is shown in figure 5. The figure suggests that teachers with higher production typically collaborate with around 5 people, indicating interdisciplinarity. However, hyperauthorship (Cronin, 2001), which should be studied further, can occur in some cases. It should be noted that an increase in the number of collaborators does not always result in higher production, as seen when there are more than 8 co-authors on average. In such cases, there may be various reasons, such as researchers lacking research and writing skills or participating in the research with less significant contributions, such as only collecting data or seeking funding. On the other hand, a lower number of co-authors may indicate that the researchers are still in the learning process and need more support. It is important to note that most of these co-authorships were before the appearance of the CRediT author statement.

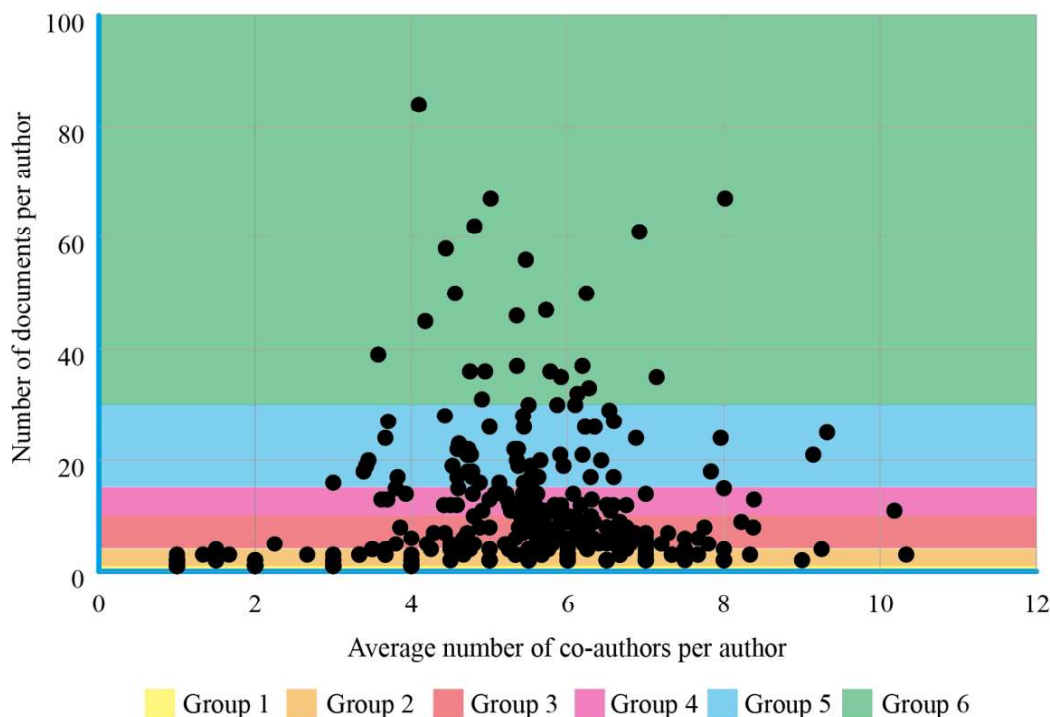


Figure 5 Average number of co-authors per document versus total documents.

Professors Profiles

In order to investigate the relationship between teaching profiles assigned by UTPL and scientific production, two boxplot figures were generated. Figure 6 displays all articles alongside the corresponding professor profiles. It is evident from this figure that the professors with the highest scientific production belong to the researcher professor 2A profile, which allows for more time to be allocated towards research compared to other profiles. The second group with high production are the 1D professors, who hold leadership positions in departments, careers or programs, and consequently have more time dedicated to management tasks than research. This can be attributed to their responsibility of ensuring academic productivity at the university while conducting research. Profiles 2B and 2C have lower production than 2A since they have less time allocated to research. It is noteworthy that professors with teaching-only profiles (3A, 3B, and 3C), without any dedicated research hours, also exhibit scientific production. Through their productivity, these professors may have the opportunity to ascend to profiles 2A, 2B, or at least 2C. The same data was reorganized including the 6 analysis groups as shown in Figure 7.

In general, figure 7 shows that all profiles in each group have similar contributions. This means that the assigned teaching profile by the university does not have much influence on scientific production, rather it is the group to which it belongs. These groups may be related to the learning curve in research and publication, where group 1 is starting that career, while group 6 is in another learning stage. It is clear that the time dedicated to research

varies between profiles, but a person with fewer hours allocated to research and the right skills can achieve the same level of scientific production.

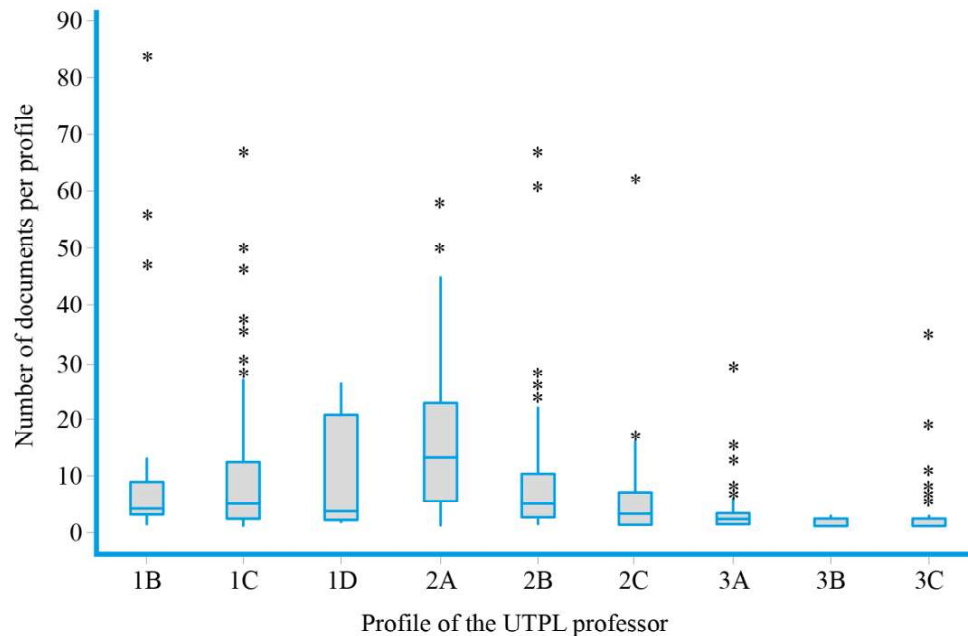


Figure 6 Boxplot of total number of publications and professors' profiles

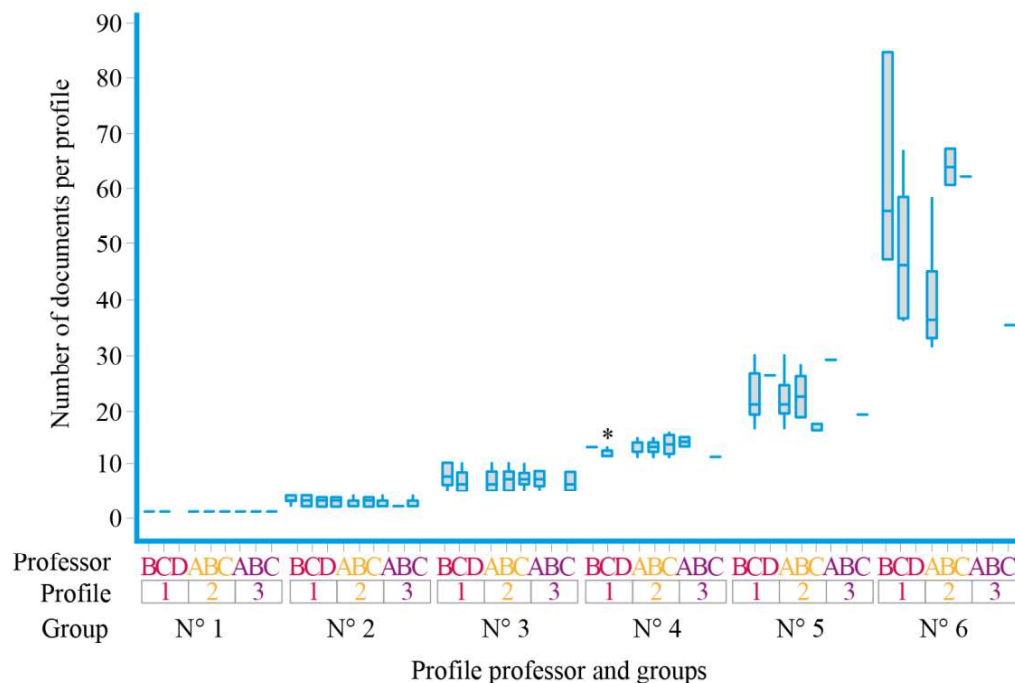


Figure 7 Boxplot of the total number of publications, the profiles of the professor for each group analyzed.

Correlation Matrix

A correlation matrix was used to test whether there is any relationship between the number of indexed documents and some variables related to the researchers. Before performing the analysis, the researchers' profiles were assigned numbers, for example, 1B = 1, 2B = 2, etc. The variables considered in the analysis included the group to which the researchers belong (1-6), their professor profile (1-8), average number of coauthors, first year of entry into Scopus, average FWCI, number of areas of contribution, percentage of areas with FWCI greater than 1, and the percentage of articles in which the author is the first author. The statistical software Minitab (State College, 2005) was used for the analysis. Table 5 shows the correlation matrix.

Table 5 Correlation matrix between publications per year and other author variables

	Doc. per year	Group	Profile	Year of Scopus entry	FCWI average	NAC	Areas with FWCI \geq 1	% First author
Group	0.853 *							
Profile	-0.246 *	-0.293 *						
Year of Scopus entry	0.674 *	0.811 *	-0.227 *					
FCWI average	0.372 *	0.576 *	-0.263 *	0.486 *				
NAC	0.924 *	0.823 *	-0.249 *	0.617 *	0.407 *			
Areas with FWCI \geq 1	0.239 *	0.379*	-0.177*	0.236*	0.823*	0.279*		
% First author	0.021 ***	0.070 ***	-0.017 ***	0.028 ***	0.148 **	0.011 ***	0.121 **	
N° of co authors	0.309 *	0.542 *	-0.231 *	0.419 *	0.656 *	0.326 *	0.481 *	0.095 **
<p>*P-value = 0.000. **P-value \leq 0.05, ***P-value $>$ 0.1</p> <p>NAC: number of areas of contribution,</p> <p>Group: number of group based on the number of publications (1 to 6),</p> <p>FWCIaverage: Average Field-Weighted Citation Impact.</p>								

Table 5 indicates that the number of indexed documents per year is significantly correlated with the group to which the researcher belongs, the number of areas of contribution, and the first year of entry into Scopus. These variables show a moderate to strong positive correlation with the number of indexed documents per year. On the

other hand, the average FWCI, the number of co-authors, and the teaching profile show a weaker positive correlation with the number of indexed documents per year. Finally, the percentage of articles in which the author is the first author was not found to be statistically significant.

Discussion

The groups identified in this study have varying levels of annual document production, not only in scientific articles but also in conference papers, books, and book chapters. While it is expected that all groups will continue to increase their output in this database, they will not do so at the same rate. It is worth noting that the groups with higher publication rates may reach a plateau at some point, while the groups with lower rates may have the opportunity to surpass them. It is important to consider that academics feel that the system has greatly increased their pressure to publish (Coulthard & Keller, 2016), which could lead to unethical practices such as salami slicing, plagiarism, duplicate publication, fraud, or ghost authorship (Rawat & Meena, 2014).

The groups that have higher publications tend to have more collaborations with other researchers, as evidenced by the number of co-authors they have and the number of areas they publish in. Studies have shown that a higher degree of interdisciplinarity in a publication is associated with a greater emphasis on local issues (Chavarro et al., 2013). The trend of increasing numbers of authors per article has been observed in all journals at an average rate of 0.076 ± 0.057 authors per article per year (McDonald et al., 2010). This indicates that collaboration is becoming increasingly important in research. Groups with lower publications can learn from this trend and increase their research production by fostering collaborations with other researchers in their fields.

It's important to note that the groups with higher production also tend to have a greater impact, not just in terms of the number of citations but also with regards to the Field-Weighted Citation Impact (FWCI). It has been shown that international co-authorship can have a positive contribution to the FWCI of an institution, but there is still potential for increasing collaboration among young institutions (Khor & Yu, 2016). It's also interesting to note that the average FWCI values for the different groups are close to 1 and have lower confidence interval values compared to the other variables, indicating that there is less variability in this measure across the different groups. Furthermore, it's important to investigate the areas where these publications have the greatest impact, as this could depend on factors such as research teams, legislation, and funding opportunities.

In this study, it was observed that groups with lower production tend to appear as first authors in their papers, while groups with higher production show a decrease in this percentage due to collaborative efforts with other researchers. In all disciplines, first and last authors typically contribute to more tasks than middle authors (Larivière et al., 2016). However, the literature has not shown a direct relationship between the number of authors and scientific production, but rather with the number of citations. For instance, previous research has demonstrated that the number of authors, as well as the length and complexity of the abstract, have a strong positive influence on the number of citations (Sienkiewicz & Altmann, 2016). On the other hand, there is

evidence that contradicts the notion that multi-authored papers are typically of higher quality than single-authored papers (Khor & Yu, 2016). Interestingly, in this study, the number of co-authors did not have a direct relationship with scientific production. While authors were found to have articles with a large number of co-authors, this did not lead to an increase in production. Further investigation is needed to better understand this phenomenon.

The relationship between faculty profiles and scientific production has been observed in this study. It was found that some faculty profiles have more time assigned for research than others, while some profiles have no assigned time for research at all. Interestingly, within groups, the profiles exhibited a similar level of production regardless of their assigned time. However, there is currently no research on the available time of professors and its relationship with scientific production. This topic warrants further investigation in future studies.

There are various researcher-related variables that appear to be associated with annual research production, and one of the most prominent among them is the research group to which they belong. However, if models were calibrated, multicollinearity could be observed, given the interdependence between these variables. Therefore, it would be more appropriate to consider this relationship as a group effect, where people with shared characteristics tend to produce more, owing to factors such as personal motivation for research, professional growth, or community service, among others. Further research is necessary to better understand this relationship.

This study has several limitations that should be acknowledged. Firstly, it is important to note that only Scopus was used as the data collection site, which may lead to incomplete data since it ignores the problem of authorship in multi-author publications (Vavryčuk, 2018). There are other databases or indices that researchers may choose to publish in, such as Web of Science, Latindex, among others, which do not appear in Scopus. Nonetheless, Scopus was the data source used for this analysis, and the same analysis can be carried out with other databases. Secondly, the analysis was only carried out with one university in the country, which may limit the generalizability of the findings. However, this university is one of the institutions that publishes the most in the country and is representative of the average among the top 10 institutions. Additionally, the documents were counted for all authors, and self-citations were not excluded, which could have inflated the citation counts. Finally, no analysis was carried out between the different areas of knowledge, which could provide insights into the research situation of the institution in specific fields. Despite these limitations, the study provides a general overview of the institution's research situation.

Conclusions

This article aims to examine the relationship between scientific publications and variables of Ecuadorian researchers using the affiliation of the Universidad Técnica Particular de Loja (UTPL). To do this, the Scopus® database was analyzed from 2010 to 2022. The main conclusions are presented below.

The study found that the growth in the number of publications in Ecuadorian academia began mainly due to state legislation and regulations, which emphasized the need to publish research. This led to an increase in research being conducted in academia. The analysis also showed differences among the various groups of researchers, indicating that the university should have a differentiated strategy for each group. The procedure detailed in this study can serve as a reference for other institutions or for those who wish to evaluate the performance of their teachers. It is important to note that while publications bring prestige to teachers and institutions, the main focus of research should not be lost. Overall, the findings suggest that the promotion of scientific research is important and necessary for academic institutions to stay competitive, but it is equally important to ensure that the quality of research is not compromised by a focus solely on publication numbers.

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