Factors that Influence the Scientific Production of Teachers in Peru

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Abstract

The purpose of the research is to determine the factors that influence the scientific production of teachers in Peru. Approached from the positivist paradigm, quantitative approach and basic type, descriptive-explanatory, the sample made up of 215 university professors calculated with probabilistic sampling, was used in the questionnaire and the survey as an instrument and technique, respectively. Content and construct validity were performed, as well as the reliability of the instrument through Cronbach's alpha, Omega and Theta. The factors that influence scientific production are: institutional factor, personal factor and the stimulus factor. It is concluded that the predominant factor that influences scientific production is the stimulus and the predominant indicators are incentives, prizes, bonuses, knowledge and participation in research methodology courses, empowerment or individual capacities and the personal motivation of teachers in scientific production.

Keywords: Motivation, Methodological Knowledge, Stimuli, Scientific Production.

DOI: 10.47750/pnr.2022.13.S03.045

INTRODUCTION

The University is the institution in charge of contributing to the development of society; therefore, it is in charge of promoting, managing and disseminating research from its classrooms; In this way, it expands knowledge and proposes viable solutions to various problems according to the historical context in which they materialize. Currently, the scientific research process, at the level of university work, is the key factor that allows scientific-technical development and, with it, achieves the recognition of the institution of national and international scope [1]; Therefore, there is an urgent need to analyze those factors that will influence scientific production in order to have an updated overview of them.

Faced with the massive growth of education, the uncontrollable trends towards globalization, coupled with the process of the knowledge economy, have assumed that institutional prestige or excellence is an increasingly important aspect of higher education as the competitiveness between graduates, institutions, among others [2,3,4]. In the case of developed countries and most developing countries, the demand for higher education is currently insatiable, where individuals, in an increasing number, attend higher education institutions and with it the need projection of the image of quality of these institutions that is reflected in the quantity and quality of the scientific production of teachers [5,3]. Contemporary economic forces are increasingly shaping universities, the same ones that operate far beyond the borders of a State and when the flow of students and research funding has an increasingly international character, for which it recommends that it is an inescapable task to have a vision at the national level about the type or types of universities that are encouraged or required to exist and the ways in which public, and perhaps private, money is spent in the management of such institutions [4].

Importance of Production

Scholarly publishing is not simply an industry that accommodates technological innovation as it is, by its nature, a system that underpins claims of new scholarly knowledge and has enormous influence on the professional position of researchers and universities around the world. world. On the other hand, academic publications are essential to assess prestige recognition and are widely used as a form of symbolic capital by the academic community and its institutions [4].

The diffusion of the findings, in a formal way; that is, through indexed publications, it tends to be considered as activities

linked to research and scientific production [6]. In this regard, seventy-five percent of researchers in the Latin American region are in public university cloisters, due to the fact that both research and the promotion of results are feasible thanks to public investment [7]. According to what was expressed, a large part of Peruvian university teachers (48%) perceive some motivation for the current legislation in relation to higher education, the same ones who are concerned about the reduced economic support and technical advice for the development of the scientific productions [8].

On the other hand, there is no reason to suppose that the amount of research required by a nation state grows proportionally with its student population [4]. Although it is assumed as a dogma that teaching in higher education is based on research, it is likely that teachers are up to date in their area and their research is better taught, although fighting against this precept requires a more detailed vision of the investigation. and a greater acceptance of the value of scholarship that is linked to teaching.

One of the gravitating elements that have sought a significant increase in scientific production has been a consequence of the use of digital resources whose scope lies in the use of technological resources and various tools that facilitate and/or assist in said process, coupled with digital competence. of teachers and researchers [9].

The idea of co-production and its implications is described as the phenomenon of 'cobiquity', a term that defines how the apparent appetite for the practice of participatory feature research, in addition to the accentuated emphasis on works in association or combination with the possible related appearance of the plethora of 'co' words, which would tend to promote a combination of meanings and practices from different collaborative traditions [10]. One of the points to be discussed in this paper is referred to the co-production of research works, which has been widely defended as a means to facilitate the use and impact of research [10,11].

Factors that Influence Scientific Production

Academic work and scientific production in Peru are considered as indicators related to scientific production, which, in turn, are key elements of productivity reflected in the various publications in accordance with international standards. Among the factors that intensify a scarce academic production, the little or no economic incentive has been rebounding, in addition to advising and adequate training [8,12].

It should be taken into account that, despite the fact that there are several works that have addressed the question of how classifications have been reshaping the field of higher education, there are few works that delve into the influence that classifications have on the evaluation of teaching work and the production of knowledge [13]. Basic research is still favored over applied research, neglecting the analysis and projection of the importance in which the former can lead to the latter [4].

On the other hand, with respect to publications of a scientific and/or academic nature, this item is for commercial service, so much so that there are few companies in this area who, in the case of North America (a country that enjoys a high academic production) such activity can assure its investors up to 40% annual profits (which is why it is among the most profitable activities on a global scale); fact that would not be a negative aspect if it did not have a direct impact on research budgets [7,14].

Now, turning to the national category, the issue is not far from the context of the northern region, since many of the publications that the Concytec (National Council of Science and Technology), a legal entity that regulates academic work in the medium, requires researchers to be classified within their canons, they should preferably be housed in repositories such as Wos, Scopus and minimum Scielo, and that, many times, the publication costs in the aforementioned repositories demand a considerable amount of the already meager budget allocated to investigations.

Another aspect to consider is co-production, which is a collaborative research model that seeks the inclusion of interested parties in the research process [11]. Regarding studies referring to co-productions in the research spectrum, specifically in the field of health, they highlighted, among other aspects, the so-called professional costs among the participants; They concluded that there are four mutually binding limiting factors: (1) the adoption of a problematically expansive definition of co-production that does not allow elucidating the key characteristics that distinguish a co-production from a broader collaboration; (2) the existence of a considerable focus on the technocratic foundations to co-generate an investigation and an evident detachment from the democratic foundations; (3) the transposition of legitimate concerns linked to the collaboration between researchers and professionals to work towards patients, service users and marginalized citizens; and (4) the inevitable scourge of bad practices as a core defect of co-production, by which the corrupting or delegitimizing influence of contextual factors within academic research that tends to facilitate or even promote such bad practices tends to be made invisible. [10].

Regarding the low priority given to co-production in research, such an event lies in long-standing structural inequalities in the academic world; which has resulted in generating a disproportionate expectation/obligation on the part of those located in less prestigious academic positions to carry out research work with insufficient resources [11]. This dilemma is not an argument capable of justifiably delegitimizing the mechanisms of academic co-production; recommended, in turn, that researchers be directly involved in being critical of the structural inequalities that develop at the academic level, since such processes undermine both the importance of more participatory research approaches and the status and work of those who they undertake [10]. Based on

the foregoing, there is no legitimate justification for ruling out co-production; instead, the praxis of co-production in research should aim to develop a critical awareness of the structural inequalities that develop in the academic world, the same ones that undermine both the importance of more participatory research approaches, as well as the status and work of those involved.

Institutional Factor

It can be considered relevant from the statistical point of view in relation to the sense of identification-belonging of the research professor in front of a certain institution since, in the Peruvian case, the highest percentage of professors in the universities with the highest academic production (private sector) is under a temporary hiring regime [8,15].

Research is still given priority over teaching, even in many university institutions where most of the budget collected derives from teaching activity. For this reason, the academic conception of being a professional continues to gravitate strongly towards research excellence, while the levels of teacher training in universities and of teaching qualifications continue to be low [4].

Person Factor

Regarding the scientific production by the undergraduate student body, it can be considered as the forging crucible of future researchers who, a posteriori, will increase their skills at the postgraduate level since the research skills and abilities will be at an ideal level to delve into research. future research [6].

Teaching and research in higher education are usually guiding elements of university praxis [10]. It should be taken into account that the individual factor must be considered as a capital element with a significant potential for improvement [7]. The foregoing makes it possible to demarcate certain observations, for example, there is a tendency to evaluate teaching staff according to criteria referring to evaluating only research of international importance, erudition lacks prestige and the status of teaching is a coincidence [4].

Stimulus Factor

Regarding the stimuli in the academic field, the authors' call for greater recognition of the qualified nature of said work, their comprehensive discussion of the personal costs experienced by some professionals involved and their willingness to identify inequalities in the work are welcomed. and the reward [10].

METHODOLOGY

The research methodology was descriptive-explanatory, cross-sectional, non-experimental design, basic type and the quantitative approach that corresponds to the parameters of the positivist paradigm. The population made up of 488 teachers who carry out scientific production in ten universities in Peru; the sample was 215 university professors calculated through simple random probabilistic sampling. The collection of information was carried out through the survey as a technique and as an instrument the questionnaire of factors that influence scientific production, this was subjected to content validity by expert judgment, as well as construct validity through analysis. exploratory through the Kaiser-Meyer-Olkin measure of sampling adequacy (0.961), Bartlett's sphericity test (Approx. Chi-square = 5910.861; df = 300; Sig. <0.001) and total explained variance (74.719%), the confirmatory analysis with the multivariate non-normality of Mardia in Kurtosis = 51.060 and p -value $\leq$ 0.001 *** <.001 and the reliability of the instruments through Cronbach's Alpha, 0.971, Omega coefficient 0.942 and Theta coefficient 0.972. According to the reliability statistics, it can be said that the questionnaire is reliable and has internal consistency.

RESULTS

The levels assigned, after the conversion of scales using scales, were high, regular and low level of scientific production.

Table 1: Scientific production in university teachers as a consequence of the institutional factor

Level	Frequency	Percentage
Bass	72	33.5%
Moderate	73	34.0%
Tall	70	32.6%
Total	**215**	**100.0%**

From table 1, it is observed that 33.5% of the teachers surveyed presented a low level of scientific production, this fact is evidenced when the institution or university where they work organize scientific events, but do not systematize them in a research book or publications. in scientific journals. Likewise, teachers consider that scientific production does not obey or respond to having good laboratories since they consider that it is not important for scientific production. 34% of teachers carried out moderate or regular scientific production, this is due to the fact that universities provide facilities such as carrying out field work in the institution and said works can be disseminated and published in university editorials; Likewise, they refer that the production opportunities are linked to the internships that the institution promotes. 32.6% carried out scientific production at optimal or high levels, depending on the institutional factor when teachers belong to research institutes, members of research societies and when carrying out research projects with financing for scientific production.

Table 2: Scientific production in university teachers as a consequence of the personal factor

Level	Frequency	Percentage
Bass	71	33.0%
Moderate	74	34.4%
Tall	70	32.6%
Total	**215**	**100.0%**

From Table 2, 33% of teachers reported that the low scientific production oriented to personal aspects is due to attending courses on research methodology, information search, scientific communication, scientific writing, although they are fundamental in the execution process. of the research work, but this does not guarantee the publication of the scientific works of the teachers. 34.4% had a regular level of scientific production; personal reasons are the time dedicated to research, own initiative and economic resources for publications. 32.6 of the high levels of scientific production were due to personal motivation to investigate, experience in teaching and consultancy in research work and subscription or membership in scientific journals.

Table 3: Scientific production in university teachers as a consequence of the stimulus factor

Level	Frequency	Percentage
Bass	55	25.6%
Moderate	115	53.5%
Tall	Four. Five	20.9%
Total	**215**	**100.0%**

As shown in table 3, 25.6% of teachers were found to have low levels of publication linked to the stimulus factor, stating that this event occurs when teachers are stimulated by scholarships or courses; Although they are important, they do not determine scientific production or publication. 84.4% of teachers presented high scientific production, they state that this fact is due to incentives for scientific publication, incentives and bonuses to researchers.

The contrast of the hypotheses was carried out using binary logistic regression, due to the fact that in the data normality test the variable and the dimensions do not present normality in the data, since their "p" value is less than the value of theoretical significance (α =.05). The research hypothesis was the predominant factor that influences the scientific production of university teachers in Peru, it is the personal factor.

Table 4: Logistic regression coefficients of the factors that influence the scientific production of university professors in Peru

factors	B.	Standard error	Next.	Exp(B)	95% CI for EXP(B)	
					lower	Higher
Institutional factor	-0.017	0.014	0.200	0.983	0.957	1,009
person factor	0.014	0.011	0.206	1,015	0.992	1,038
stimulus factor	-0.222	0.104	0.033	0.801	0.654	0.982

Source: Database

It is observed that the significance of the personal factor is 0.206 greater than 0.05; therefore, the general hypothesis of the research was rejected, because the predominant factor that influences the scientific production of university teachers in Peru is the stimulus factor with the significance value 0.033 and B = 0.222, it is also the factor a factor of risk in scientific production by the value Exp(B) 0.801.

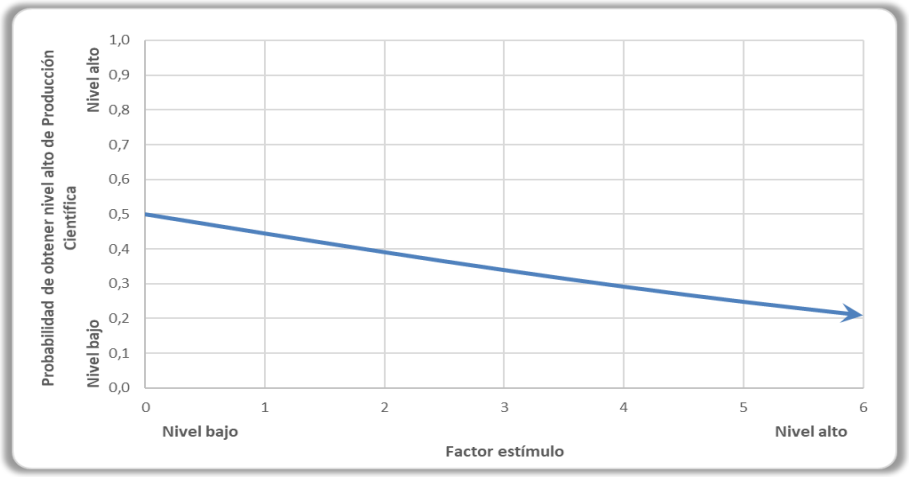

Figure 1: Relationship of the stimulus factor with the scientific production of university professors in Peru

The stimulus factor had a negative influence on scientific production in university professors because at a higher level of stimulation it is likely to have high levels of scientific production in university professors.

The specific hypothesis 1 affirms that the predominant indicator of the institutional factor that influences the scientific production of university professors in Peru, uses a laboratory in the institution to investigate.

Table 5: Logistic regression coefficients of the indicators of the institutional factor that influence the scientific production of university professors in Peru

Institutional factor indicators	**B.**	**Standard error**	**Next .**	**Exp(B)**
Contests for projects with financing	.196	.175	.265	1,216
Research facilities	-.076	.119	,521	.926
Organization of scientific events	.227	.143	.112	1,255
Research institute member	,417	.203	.040	1,517
Research Internships	-.426	.231	.065	.653
laboratory to investigate	,204	.193	.292	1,226
Incentives from the institution to the researcher	-.643	.202	.001	.526
Institutional agreements	-.019	.205	,927	,981
Grants scholarships to researchers	.103	.174	.555	1,108
editorial backgrounds	.040	.148	,787	1,041

Source: Database

It is observed that the significance of the use of laboratories for research in the institutional factor is 0.292 greater than 0.05; therefore, the research hypothesis was rejected, because the predominant indicator that influences the scientific production of university professors in Peru is the incentives of the institution to the researcher with the significance value 0.001 and B = 0.643, we can also refer which is a risk indicator of the institutional factor that determines scientific production by the value Exp(B)= 0.526 in order of priority one, in second place that meets the significance is the indicator being a member of the research institute who provides greater possibility in scientific production.

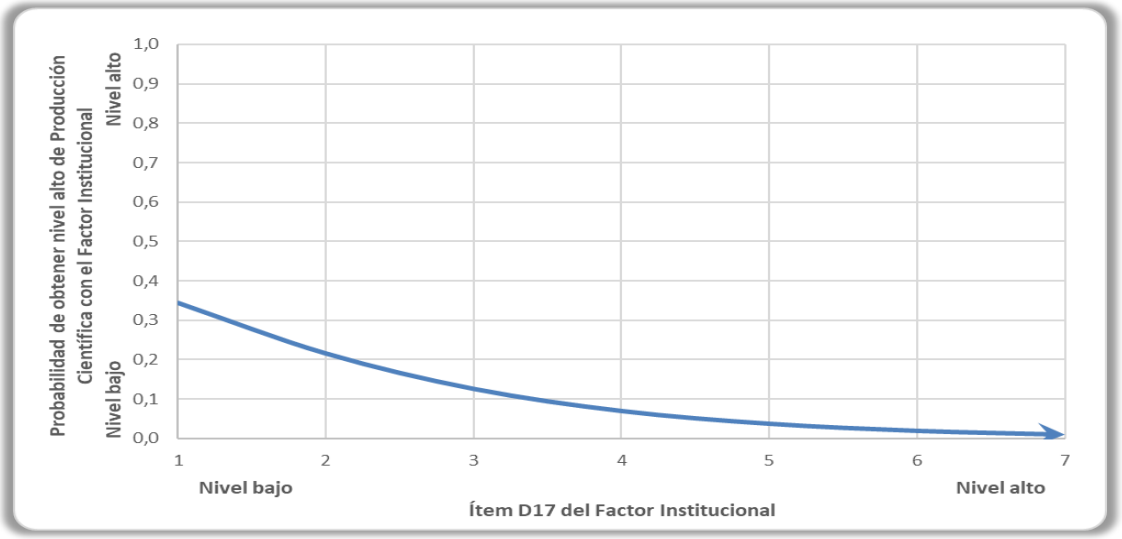

Figure 2: Relationship of the indicator in D17 of the institutional factor with the scientific production of university professors in Peru

As shown in figure 2, the institution's incentive indicator for the researcher of the institutional factor represented a risk factor for the scientific production of university professors because, at a lower level of incentives to the researcher, the probability of having high levels of scientific production in university teachers due to the institutional factor.

Specific hypothesis 2 states that the predominant indicator of the personal factor that influences the scientific production of university professors in Peru is the motivation of the researcher.

Table 6: Logistic regression coefficients of the personal factor indicators that influence the scientific production of university professors in Peru

Indicators of the personal factor	B.	Standard error	Next.	Exp(B)
Attendance at scientific writing courses.	.158	.109	.147	1,171
Subscription to scientific journals	.120	.128	,348	1,128
Attendance at scientific publication courses	.152	.132	,250	1,164
research teaching	.002	.163	.989	1,002
Experience and time teaching research	-.078	.170	.646	.925
Research motivation	.127	.145	,380	1,136
Attendance at scientific congresses	.020	.139	,887	1,020
Attendance at methodology courses	.264	.171	.123	1,302
Personal inquiry to investigate	-.069	,200	,729	.933
Positive attitude in production	-.243	.233	,296	,784
scientific empowerment	-.362	.249	.147	,696
Research consultancies	.004	.102	.968	1,004

Source: Database

It is observed that the significance of the researcher's motivation in the personal factor is 0.380 greater than 0.05; therefore, the research hypothesis was rejected because the predominant indicator that influences the scientific production of university teachers in Peru, scientific empowerment in the first order with absolute value B= 0.362 and second order with value B= 0.264, is attendance. to research methodology courses. However, neither is significant. Therefore, we can affirm that there is no significant difference between the indicators.

Specific hypothesis 3 maintains that the predominant indicator of the stimulus factor that influences the scientific production of university professors in Peru is the economic bonus for research.

Table 7: Logistic regression coefficients of the stimulus factor indicators that influence the scientific production of university professors in Peru

Indicator	B.	Standard error	Next.	Exp(B)
Awards and recognition for research (stimulus)	-0.661	0.236	0.005	0.516
grant scholarships to researchers	-0.070	0.237	0.768	0.933
Economic bonus to investigate	0.346	0.285	0.225	1,413

Source: Database

It is observed that the significance of the economic bonus to investigate in the stimulus factor is 0.225 greater than 0.05; therefore, the research hypothesis was rejected, because the predominant indicator that influences the scientific production of university professors in Peru is the awards and recognitions for research with the significance value 0.005 and B = 0.661, we can also refer that it is a risk indicator of the stimulus factor that determines scientific production by the value Exp(B) =0.516.

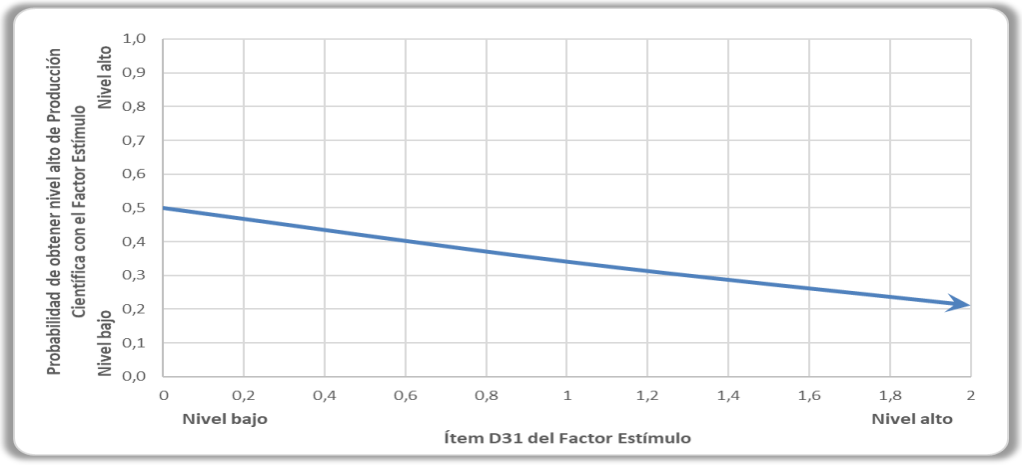

Figure 3: Relation indicator prizes and recognitions for investigating the stimulus factor with the scientific production of university professors of Peru

As can be seen in Figure 9, prizes and recognitions for university professors of the stimulus factor represented a risk factor for the scientific production of university professors, because the greater the scientific production, the probability of increasing the prizes and recognitions for teachers decreases. university teachers.

DISCUSSION

84.4% of teachers presented high scientific production, they state that this fact is due to incentives for scientific publication, incentives and bonuses to researchers; In the same line, the research shows that the predominant factor that influences the scientific production of university teachers in Peru is the stimulus factor with the significance value 0.033 and B = 0.222, it is also the factor a risk factor in scientific production for the Exp(B) value 0.801; if the stimuli are cut or do not exist with respect to the level of scientific production of university teachers, it would decrease in accordance with the results. It was evidenced that the increase and improvement of resources allocated to research, as well as economic incentives for researchers, science and technology policies, the scientific community, mechanisms for disseminating research results and administrative aspects are strategic points that should be considered. be adopted as institutional policies by universities to promote research [16]. The growth and scientific production of university organizations is essential and with it the strengthening of investigative skills and critical thinking of teachers; From the perspective of the aforementioned results, we can affirm that the conduct of research that in the future leads to scientific production, which is not planned, executed only with good will, requires greater funding, recognition and incentives for researchers; The greater the incentives, bonuses and prizes for teachers, we achieve motivation, unplanned needs are covered, especially the levels of scientific production increase.

The predominant indicator that influences the scientific production of university professors in Peru is scientific empowerment or individual capacity with absolute value B= 0.362. It is disclosed that universities in coordination with the State and society in general should work in a coordinated manner to improve the research capacities of teachers, with this the deconstruction and reconstruction of academic programs that improve and increase scientific production., in the same idea, reflect a significant relationship between the research culture of the teacher and Latin American scientific production [16]. The results show that there is a strong relationship between the educational level as high levels of knowledge, and cognitive, methodological and attitudinal skills and the publication in indexed journals, showing that the higher the academic degree of the teacher, the greater interest in publish in indexed journals exists. On the other hand, another important indicator, according to the results obtained, is having knowledge of research methodology as a result of university subjects or attendance at courses influences scientific production with value B=0.264 is attendance at research methodology courses, it is affirmed that the formation of an integral professional, with solid knowledge in scientific research is vital, in such a way that he is equipped with the tools for the solution of problems and scientific production, this is achieved with the motivation, necessary in the training of investigative skills in our teachers. The mission of higher education is to train highly qualified professionals, who are capable of guaranteeing the development of science and its materialization in production, in such a way that they contribute to the scientific-technical progress of their countries. Training and development in investigative skills of teachers is essential and fundamental for scientific production [17,18].

CONCLUSIONS

Of the factors analyzed, it is determined that the stimulus factor is the predominant one and affects scientific production in the case of university teachers evaluated, which is why it is possible to conclude directly that, if the stimuli are cut or failing, the scientific production of university teachers would decrease.

Regarding the incentive indicator compared to the institutional factor that the university provides to the researcher, it can be concluded that it is, in itself, a risk factor that could strongly affect the scientific production of university professors, since a cut or nullity with respect to the incentives granted to the researcher would have a negative impact on the probability of raising the quantity and quality of scientific production in teachers.

The analysis carried out on the predominant indicator of the personal factor that influences the scientific teaching production, it was possible to conclude based on the results obtained that the absence of significant differences between the indicators scientific empowerment and research methodology courses would not have a considerable effect on the probability of raising or lowering the quantity and quality of scientific production in teachers.

Finally, according to the results obtained, it is concluded that the predominant indicator referring to the stimulus factor that affects the scientific production of university teachers is linked to awards and recognitions; Therefore, it is sensible to assume it as a risk factor, since the lack of recognition of the institution towards its researchers would have a serious setback on the quantity and quality of scientific production and, with it, a direct impact on the institutional image. Nationally as well as internationally.

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