Social Science and Humanities Journal
Everant Journal
https:https://sshjournal.com/
Impact Factor: 2024: 6.576
2023: 5.731
ISSN: 2456-2653
Volume 08 Issue 02 February 2024
Doi: https://doi.org/10.18535/sshj.v8i01.919

Collaborative Technologies to Optimize Scientific Production in High-Quality Bibliographical Databases Worth

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Received 29-01-2024
Revised 30-01-2024
Accepted 10-02-2024
Published 12-02-2024

Abstract:

The purpose of this research article was to use collaborative technologies to optimize scientific production in high-value bibliographic databases. The problem that was intended to be solved were the practical problems that arose in scientific production in a Peruvian public university, with It was possible to minimize time and effort in detecting, checking scientific documents, and carrying out research reports. It has been developed following a quantitative approach, with a descriptive-correlational scope, non-experimental design, applying statistical analysis. The study was carried out with university researchers who used technological tools for research, who were selected through a sample. In addition, the statistical package SPSS version 28 was used, and the results showed that there is a significant correlation between the study variables.it was concluded that collaborative technologies as research tools allowed to optimize and increase scientific production in the university environment, so its use in the research field is recommended.

Keywords: Collaborative technologies, scientific production, academic search engines, word processors.

Introduction:

Currently, there are multiple discussions about the advantages of using collaborative technologies by researchers to optimize scientific productions, this involves searching, bibliometric analysis, information management, organization of citations and references, in databases. bibliographical data of high value, which favors the development of investigative and informational skills, abilities and capacities.In this regard, WIPO [1] in the 14th version of the 2021 World Innovation Index shows us that several sectors have shown admirable resilience, especially digitization, technology and innovation, however; Peru lags especially behind in the pillars of creativity production (77th place), digital infrastructure (78th place), and knowledge and technology production (87th place).

In this same sense, in the II Biennial Report on the University reality in Peru carried out by SUNEDU, referring to the results of the research, it indicates that the calculation of the ranking is based on 3 indicators: scientific production per capita, scientific impact and international excellence. . Based on the indicators and information from the documents published in journals indexed by Web of Science and SCOPUS, it has been shown that there was not enough scientific production by the Federico Villarreal National University. This

reality allows us to indicate that one of the factors It is the lack of knowledge of the benefits of using collaborative research technologies such as: bibliographic databases, SCOPUS, Web of Science, Scielo, Proquest, among others, bibliographic managers and references, such as Mendeley, Reference Manager, EndNote, RefWorks, and Zotero; scientific mappers, such as SCI2, Vos Viewer, Bibexcel, Pajek, Gephi, CiteSpace; journal quality evaluators such as SCImago Journal & Country Rank (SJR), MIAR, H-Index Scholar, Master Journal List - IP & Science Thomson Reuters and Eigenfactor Revealing the Structure of Science, scientific word processors, such as LaTex, Scrivener, Citavi , Ref-N-Write and Typeset and scientific browsers such as Google Scholar, HighBeam Research, Redalyc, Chemedia and RefSeek.

In recent studies,[2] mention that bibliographic reference managers are used to make citations, references and that it is used as computer resources for the development of research projects. In this same sense, [3] it is pointed out that scientific production has increased in quantity and quality thanks to the use of digital technologies (SCOPUS, WOS databases) in education and also that these cause motivation and creativity in educational environments. of virtual learning. [4] With regard to knowledge management as a platform to socialize scientific production in the preparation of scientific articles, the use of tools, technological scenarios that enable the identification, development and dissemination of scientific production through the use of bibliographic managers . In recent years [5] bibliometrics has become a tool to evaluate and analyze data such as the production of researchers, collaboration between universities, research results, development and educational efficiency, among other applications.

The need has arisen of the use of software [6] in the field of research, which has its own characteristics that allow knowing the aspects of bibliometric visualization as the data source.[7] In this same sense, the panorama shows that the majority of researchers turn to bibliographic managers, it is highlighted that there are still associated factors that restrict the use of research technologies such as costs, language, access, technological skills of researchers, outreach and training . [8] Along these same lines, there is a tendency for academics to be valued for the number of publications they obtain.

The treatment of the research work, part of the idea of [6] who indicated that collaborative technologies allow to visualize bibliometric networks, such as: analysis and visualization of network graphs, bibliometric and scientometric analysis, statistics, text analysis and data mining. We divide this study variable, called collaborative technologies, into the following dimensions: first, from the perspective of some researchers, the academic search engine [9] is a technological tool for querying files stored on web servers specialized in academic material such as theses, magazines, papers, among others; through the web place. In this regard, some examples of search engines that currently exist are mentioned: Dialnet, Scielo, Iseek, Eric, Academia, Refseek, Science Research, Teseo, Redalyc, Microsft Academic Research and Google Academic Secondly, the databases, understood as spaces to provide researchers with multidisciplinary scientific and academic publications, include SCOPUS, Dialnet, , Redalyc , Redib, Redined, Scielo, Eric or Web of Science. Likewise, [10] another dimension is bibliographic references, such as: Mendeley, Zotero, EndNote Basic, RefWorks among others, these allow managing scientific information through the storage and organization of information, the interrelation and dissemination of research, and the management of citations and references, facilitating the bibliographic adaptability of research to certain standardized styles automatically. [11] Along this same line, It is emphasized that the incorporation of bibliographic reference managers to research has the following benefits: organizer of citations, references and as a computer resource for the development of projects. In the same way, another dimension is word processors, according to studies [12] it is indicated that these favor the proper handling of writing,

which is essential for scientific progress and therefore for scientific productions, since they offer the possibility of giving technological advice while writing, you can access digital templates With instructions for writing, these tools are useful for academic writing, for example RedacText, LEA lab, online dictionaries, blogs, etc. [13] Also, there is the Padlet, which is a free application that offers a virtual wall where different people can contribute and collaborate, thus becoming an additional tool for academic writing. [14] To what has already been mentioned, the Prisma 2020 declaration reflects advances in methods to identify, select, evaluate and synthesize studies by performing a systematic review, to verify not only quality, but also the certainty and body of evidence.

On the other hand, a second variable studied is the scientific production in databases, the researchers [15], indicated that it is visualized through: Web of Science, which is a website that gives access to databases and data from multidisciplinary citations, full-text articles, reviews, editorials, abstract chronologies, proceedings (journals and books), and technical papers can be accessed. Similarly, there is Scopus, a website that offers access to databases and citation data in life sciences, social sciences, physical sciences, and health sciences, encompassing three sources such as book series, journals, and trade journals. . Therefore,[16] in the academic and research area, collaborative word processors, online education platforms and communication media have been developed, such as thinklets.

The research is justified because it will open a new path so that, based on the mastery and use of collaborative technologies, scientific production at the Federico Villarreal National University will be optimized, increasing our ranking based on indicators of scientific production per capita. From an educational perspective, the research question is focused on discovering to what extent the use of collaborative research technologies is related to scientific production in high-value databases in the context of higher education in a Peruvian university. The proposed solution was to train researchers in the use of collaborative technologies during an academic semester and after that to know their perception, instruments were developed, two questionnaires, to measure the study variables taking into account the dimensions.

Method:

[17] The research according to the purpose was of an applied type, since it allowed to improve the current situation of the scientific production of the researchers. In addition, it had a descriptive-correlational scope, since it favored knowing certain properties of the variables and evaluating the relationship that exists between them. Likewise, the variables of the study were not manipulated, so it was a non-experimental design. According to the approach, it was a quantitative investigation, fundamentally applying statistical analysis.

The survey was applied to researchers from the Federico Villarreal public university with the objective of knowing their perception about the use of collaborative technologies to optimize scientific productions in high-value bibliographic databases, they used academic search engines to obtain validated scientific information from the selected bibliographic databases. Then, through the use of bibliographic references, they managed the organization of the information obtained through the databases. Likewise, they used scientific word processors to optimize the writing of scientific information. Along these same lines , selected journals to publish scientific documents. Finally, they answered a questionnaire after using collaborative technologies , which,It served as the basis for measuring the variables and dimensions of the study. The correlation between the collaborative technologies and scientific production variables was determined using the Pearson correlation coefficient, which expresses the degree of association or affinity between the variables considered.

Results and Discussion:

It was analyzed the state of the relationship between collaborative technologies and scientific production in a representative sample of 60

researchers, who responded through the survey technique to the instrument called a questionnaire to measure the variable (X) "collaborative technologies" and the variable (Y) "scientific production ". The statistical treatment was carried out using the SPSSS version 28 program and the Microsoft Excel 2013 program for Windows.The results were obtained using the Pearson Correlation Coefficient (r) (X) collaborative technologies and the variable (Y) scientific production.

Table 1: Frequency of responses from the academic search engine dimension.

Category	**N**	**%**
Strongly Agree	268	74.4%
agree	83	23.1%
Neither agree nor disagree	9	2.5%
Disagree	0	0.0%
Strongly Disagree	0	0.0%
Total	**360**	**100.0%**

Table 1 specifies in detail that 74.4% of the researchers totally agree that the use of search engines facilitate the research work.

Table 2: Frequency of responses to the bibliographic database dimension.

Category	**N**	**%**
Strongly Agree	306	72.9%
agree	103	24.5%
Neither agree nor disagree	eleven	2.6%
Disagree	0	0.0%
Strongly Disagree	0	0.0%
Total	**420**	**100.0%**

Table 2 shows that 72.9% of researchers fully agree that databases allow access to reliable sources.

Table 3: Frequency of responses from the bibliographic referents dimension.

Category	**N**	**%**
Strongly Agree	135	75.0%
agree	40	22.2%
Neither agree nor disagree	5	2.8%
Disagree	0	0.0%
Strongly Disagree	0	0.0%
Total	**180**	**100.0%**

Table 3 indicates in detail that 75% of researchers totally agree that referrers facilitate the application of APA standards.

Table 4: Response frequency of the scientific text processors dimension.

Category	**n**	**%**
Strongly Agree	179	74.6%
agree	53	22.1%
Neither agree nor disagree	6	2.5%
Disagree	two	0.8%
Strongly Disagree	0	0.0%
Total	**240**	**100.0%**

Table 4 indicates that 74.6% of researchers totally agree that scientific word processors facilitate writing and spelling.

Table 5 Frequency of responses to the scientific visibility dimension (WOS, SCOPUS, SCIELO)

Category	**n**	**%**
Strongly Agree	277	76.9%
agree	71	19.7%
Neither agree nor disagree	7	1.9%
Disagree	4	1.1%
Strongly Disagree	1	0.3%
Total	**360**	**100.0%**

Table 5 shows that 76.9% of researchers fully agree that article publications in WOS, SCOPUS, SCIELO, etc. allow to know the scientific production.

Table 6. Frequency of responses by dimensions of the Variable Technologies Collaborative

Dimension	Academic search		Databases		Referencer		Text Processor	
Category	**n**	**%**	**N**	**%**	**N**	**%**	**n**	**%**
Strongly Agree	268	74.4%	306	72.9%	135	75.0%	179	74.6%
agree	83	23.1%	103	24.5%	40	22.2%	53	22.1%
Neither agree nor disagree	9	2.5%	11	2.6%	5	2.8%	6	2.5%
Disagree	0	0.0%	0	0.0%	0	0.0%	2	0.8%
Strongly Disagree	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	**360**	**100.0%**	**420**	**100.0%**	**180**	**100.0%**	**240**	**100.0%**

In table 6 it can be seen that the respondents knowcollaborative technologies and scientific production.

Hypothesis testing

To test the hypothesis, the Pearson Linear Correlation parametric statistical test was used. To answer the general hypothesis and the specific hypotheses, the probability of error (p) obtained with the statistical program SPSS version 28 was used.

Contrast of the General Hypothesis

Correlations

		Scientific production	Collaborative technologies
Scientific production	Pearson Correlation	1	,757**
	Sig. (bilateral)		,000
	N	60	60
Collaborative technologies	Pearson Correlation	,757**	1
	Sig. (bilateral)	,000	
	N	60	60

**. The correlation is significant at the 0.01 level (bilateral).

H1: There is a relationship between Collaborative Technologies and scientific production in bibliographic databases

H0: There is no relationship between Collaborative Technologies and scientific production in bibliographic databases

The following results were obtained from the statistical program SPSS version 26:

Significance level (alpha) $\alpha = 0.05$

Error probability (p) = 0.000000

Pearson R correlation coefficient = 0.757113

With a probability of error (p) of 0.000000, the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, Collaborative Technologies are significantly related to scientific production in bibliographic databases.

It is established that there is a high direct positive correlation (r = 0.757113) between the Collaborative technologies variables and the scientific production in bibliographic databases, in this way it can be established that these results highly support the degree of certainty of the hypothesis in mention.[18] Researchers agree and reaffirm that the use of managers allows access to knowledge and facilitates the search for analysis in the development of investigative skills

Contrast of the Specific Hypothesis 1

Correlations

		Academic search engines	Scientific production
Academic search engines	Pearson Correlation	1	,723**
	Sig. (bilateral)		,000
	N	60	60
Scientific production	Pearson Correlation	,723**	1
	Sig. (bilateral)	,000	
	N	60	60

**. The correlation is significant at the 0.01 level (bilateral).

H1: There is a relationship between the academic search engine dimension and scientific production in bibliographic databases

H0: There is no relationship between the academic search engine dimension and scientific production in bibliographic databases

The following results were obtained from the statistical program SPSS version 26:

Significance level (alpha) $\alpha = 0.05$

Error probability (p) = 0.000000

Pearson R correlation coefficient = 0.722875

With a probability of error (p) of 0.000000, the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, the academic search engine dimension is significantly related to scientific production in bibliographic databases.

It is established that there is a high direct positive correlation (r = 0.722875) between the academic search engine dimension and scientific production in bibliographic databases, thus it can be established that these results highly support the degree of certainty of the hypothesis in mention.[19] the number of cases presented without investigations reaffirms that there are digital tools that can be used in the field of investigation with excellent results that allow increasing the number of publications

Contrast of the Specific Hypothesis 2

Correlations

		Scientific production	Databases
Scientific production	Pearson Correlation	1	,596**
	Sig. (bilateral)		,000
	N	60	60
Databases	Pearson Correlation	,596**	1
	Sig. (bilateral)	,000	
	N	60	60

**. The correlation is significant at the 0.01 level (bilateral).

H1: There is a relationship between the bibliographic database dimension and scientific production in bibliographic databases

H0: There is no relationship between the bibliographic database dimension and scientific production in bibliographic databases

The following results were obtained from the statistical program SPSS version 26:

Significance level (alpha) α = 0.05

Error probability (p) = 0.000000

Pearson R correlation coefficient = 0.595982

With a probability of error (p) of 0.000000, the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, the bibliographic database dimension is significantly related to scientific production in bibliographic databases.

It is established that there is a moderate positive correlation (r = 0.595982) between the bibliographic database dimension and scientific production in bibliographic databases, thus it can be established that these results highly support the degree of certainty of the hypothesis. In mention.[20] The studies carried out in various universities ratify this result, since the need to use databases to access reliable sources is recognized, which levels the quality of the publications in the research processes.

Testing of the Specific Hypothesis 3

Correlations

		Scientific production	Referencer
Scientific production	Pearson Correlation	1	,593**
	Sig. (bilateral)		,000
	N	60	60
Referencer	Pearson Correlation	,593**	1
	Sig. (bilateral)	,000	
	N	60	60

**. The correlation is significant at the 0.01 level (bilateral).

H1: There is a relationship between the bibliographic referents dimension and scientific production in bibliographic databases

H0: There is no relationship between the bibliographic referents dimension and scientific production in bibliographic databases

The following results were obtained from the statistical program SPSS version 26:

Significance level (alpha) α = 0.05

Error probability (p) = 0.000000

Pearson R correlation coefficient = 0.592814

With a probability of error (p) of 0.000000, the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, the bibliographic reference dimension is significantly related to scientific production in bibliographic databases.

It is established that there is a moderate positive correlation (r = 0.592814) between the bibliographic referents dimension and the scientific production in bibliographic databases, in this way it can be established that these results highly support the degree of certainty of the hypothesis in question. .

[21] Research indicates that bibliographic references are of growing interest and that it is a relevant factor for scientific production with indexing.

Testing of the Specific Hypothesis 4

Correlations

		Scientific production	Text Processor
Scientific production	Pearson Correlation	1	,750**
	Sig. (bilateral)		,000
	N	60	60
Text Processor	Pearson Correlation	,750**	1
	Sig. (bilateral)	,000	
	N	60	60

**. The correlation is significant at the 0.01 level (bilateral).

H1: There is a relationship between the scientific word processing dimension and scientific production in bibliographic databases

H0: There is no relationship between the scientific word processors dimension and scientific production in bibliographic databases

The following results were obtained from the statistical program SPSS version 26:

Significance level (alpha) $\alpha = 0.05$

Error probability (p) = 0.000000

Pearson R correlation coefficient = 0.750216

With a probability of error (p) of 0.000000, the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, the scientific word processors dimension is significantly related to scientific production in bibliographic databases.

It is established that there is a high positive correlation (r = 0.750216) between the dimension scientific text processors and scientific production in bibliographic databases, thus it can be established that these results highly support the degree of certainty of the hypothesis. In mention.

[22]I t is reaffirmed through the results of other research experiences that word processors are tools that allow improving the production, cohesion and coherence of academic texts and that they provide digital support to help develop investigative writing competence.

Conclusion:

It has been verified that the respondents indicated that there are a variety of difficulties detected in the research process that can be solved through the use of collaborative technologies for scientific production, which help raise the level of investigative competence. So, the research question is answered by stating after the results obtained that there is a significant relationship between the study variables collaborative technologies and scientific production in databases.

Therefore, it is recommended to obtain the maximum benefit of these new technologies in the different investigative processes and thus give relevance to the scientific publications of the University, thus responding to the new paradigms that are presented.

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