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# Status of Scientific production of University of Birjand in Web of Science during 2000-2018

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## **Abstract:**

The main purpose of this study was to evaluate the status of the scientific production of the University of Birjand on the Web of Science databases during the years 2000-2018. The method used in this study was descriptive which used scientometric technique. The findings showed that the researchers at the University of Birjand in WOS had the highest scientific collaboration with Ferdowsi University of Mashhad with 217 documents. Based on the findings of the research, the top 7 scientific clusters were extracted from the data obtained from the Web of Science database that the first to fourth clusters and sixth belonged to the field of chemistry and the fifth and seventh clusters belonged to geology. The results of the present study showed that the status of the University of Birjand in terms of scientific output among national and international universities is not very favorable. Since the production of science and its publication in internationally accredited journals is one of the key indicators in evaluating the national and international rankings of any university, it is necessary to monitor the status of the university's scientific output on a continuous basis.

**Keywords:** Scientometrics, Scientific Products, University of Birjand, Web of Science

## **1. Introduction**

Today, relying on the ability to produce scientific information has a major role in promoting science and culture in any country. One of the important factors of scientific progress of a country, is research capacity and quality of articles. Research projects and similar works, which published in national and international level, shows the ability of nation to compete in the world (Soheili & Osareh, 2009).

Today, scientific productions are considered as one of the important and basic criteria in the

ranking of universities. Awareness of the amount of academic productions in order to grow and develop the productions with the aim of promoting educational and research status and consequently reaching a suitable position is one of the most important criteria for the growth and development of universities.

One of the important tools for identifying and measuring scientific products is scientometric method. Scientometrics is an indicator for the evaluation, quality of research and scientific productivity of universities. Scientometrics can also be considered as an important indicator for evaluating the success of universities and higher education centers in achieving educational and research goals and identifying the status of scientific progress of universities in various subject areas (Khademizadeh & Komai, 2017).

In scientometric evaluations, the main criterion for determining the scientific position and ranking of countries is the level of participation in the production of science, innovation, technology and in general participation in the process of world science development. Universities and institutions of higher education are considered as scientific institutions, the base and origin of scientific development and one of the main centers of science production. Universities are responsible for disseminating information through education and research and publishing the results of this research. Assessment and evaluation of scientific products as an essential element in scientometrics due to the role and importance of universities and the output of faculty members.

Knowing the process of scientific production of University of Birjand, and identifying and reviewing the thematic branches of this university, in addition to motivating efforts will increase the rate of scientific production. An effective step in order to improve the status of scientific productions and help to increase the scientific potential and growth of the university's position in the world's databases, followed by raising the scientific rank of the university.

The importance and necessity of recognizing the amount of scientific productions and determining the position of universities and institutes according to the amount and trend of their scientific productions has caused many researchers to be interested in this subject and many educational and research centers to study scientific productions. Some researches in this field have studied the structure of science in a specific subject area and some have considered the structure of science and the amount of scientific productions of a particular university or scientific and educational institution. Osareh & McCain (2008) mapped the science of chemistry scientific productions from 1990 to 2006; Osareh and Khademi (2012) conducted a study on the structure of Iranian physics from 1990 to 2009. The findings of the

researches show the increase of the growth of scientific publications in the mentioned thematic fields and in some of the thematic researches the ratio of Iranian scientific productions to other countries has been reported relatively low.

Research conducted abroad in recent years has focused on the scientific output of institutes in specific subject areas, and most of these studies in developed countries indicate the relatively favorable status of scientific output of this university. Hosts (Jacobs & Pichappan, 2006; Calvino, 2006; Ansuji et al., 2017; Acosta et al., 2017; Ruiz Leon, 2018). But the results of the researches (Soheili, 2011; Mansoori, 2011; Fattahi, Danesh & Soheili, 2011; Rezaghali Lalani, 2011; Jafarzadeh, 2012; Riahi et al, 2014; Momeni, 2015; Atai Roozbehani, 2017) revealed that the status of scientific production of universities and subject disciplines in Iran has not yet gained a worthy place and since scientific development is one of the most important goals in scientific advancement and achievement of goals. Therefore, more attention to this issue seems necessary.

What can be deduced from all the researches done in the country in this regard is that despite the growth of scientific productions in all fields, Iranian educational institutions are still not in a favorable position compared to other universities. Branding and improving the status of scientific products, even quantitatively, requires more serious planning, attention and effort in this regard. Therefore, considering that University of Birjand is more than 40 years old and now more than 350 faculty members are performing research and educational services, so reviewing the status of products and analyzing the quantity and quality of products of this university is necessary for planning.

Whereas the production of science plays a fundamental and important role in the information cycle in universities and higher education institutions. The study of scientific products of University of Birjand researchers is important and it is necessary to study the scientific products produced by researchers. The present study tries to compare and evaluate the amount of scientific production of University of Birjand, to provide a platform to motivate attention to more research along with education, and by stating the position of University of Birjand in the production of science among other universities and higher education centers, while stating identify the level of scientific participation and cooperation, obstacles, problems and shortcomings ahead and suggest a basis for appropriate planning and policy to increase the quantity and quality of scientific production. The present study helps to identify the current scientific situation of University of Birjand and while comparing the status of the university's scientific products with the past, to draw a perspective of the university's scientific activities for the future. The results of the present study can also be a criterion for

planning and budgeting and explaining future strategies and decisions.

The present study, while examining the position of scientific productions of University of Birjand, intends to take a step towards achieving the goals of the university in order to improve the position and rank of the university by examining the process of scientific productions. The main purpose of this study is to investigate the status of scientific products of University of Birjand in the Web of Science database during the years 2000-2018.

## **2. Research Objectives**

- To Study the position of Birjand University based on the production of scientific documents in the Web of Science database during 2000-2018
- To Study the type of scientific texts produced by researchers of Birjand University between 2000-2018 in the Web of Science database
- To study the frequency of distribution of Birjand University researchers' articles in different journals between 2000-2018 on the Web of Science website on a quarterly basis
- To study the frequency distribution of authors from countries and universities that had the most scientific collaboration with University of Birjand authors between 2000-2018 on the Web of Science

## **3. Methods**

The present study has been conducted based on the descriptive method using scientometric techniques. The research population of all scientific products indexed in the four fields of study of humanities, basic sciences, technical-engineering and agriculture are related to the authors of University of Birjand in the Web of Science database during 2000 to 2018.

Data collection was performed using Web of Science database. Excel software have been used to analyze the data of the present study.

## **4. Findings**

**The position of Birjand University based on the Production of Scientific Documents**

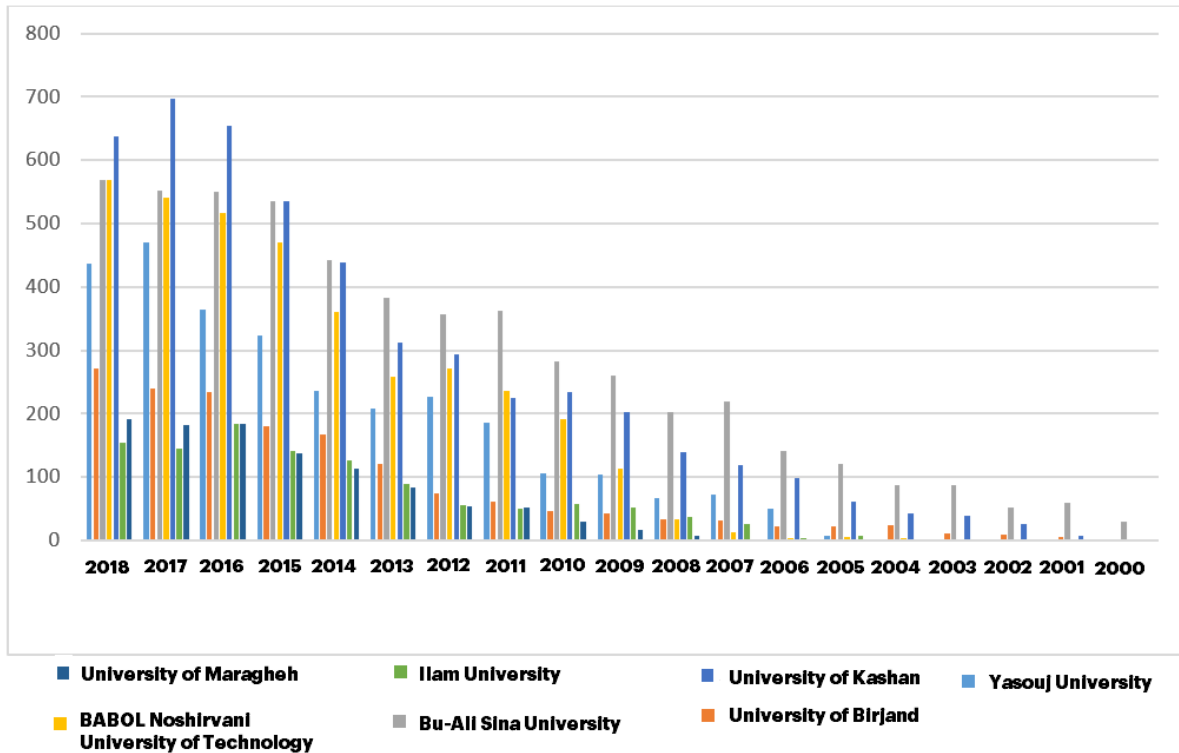


Figure 1: Comparison of some universities with Birjand University in Web of Science database in the period 2000-2018

Based on the findings of Figure 1, the share of Iranian universities in the production of scientific documents in the Web of Science database is Islamic Azad University with 68181 records (15.837%), University of Tehran with 40073 records (9.308%), University of Medical Sciences, respectively. Tehran with 32198 records (7.479%), Sharif University of Technology with 21807 records (0.565%) had the largest share in the production of scientific degrees among Iranian universities from 2000 to 2018. Meanwhile, Birjand University has played a role in this position with only 1603 scientific records (0.372%).

**The amount of Scientific Productions according to Specialized Fields in Web of Science databases in 2000-2018**

Table 2: Specialized Areas between 2000-2018 in Web of Science

SUBJECT AREA	No. of Articles
Chemistry	552
Engineering	442

<b>SUBJECT AREA</b>	<b>No. of Articles</b>
Computer Science	228
Physics	211
Mathematics	169
Agriculture	163
Materials Science	106
Environmental Sciences Ecology	103
Geology	76
Science Technology other Topics	63
Other Fields	702

According to the findings in Table 2, the highest number of documents produced between 2000 and 2018 in the Web of Science database, the field of chemistry with 552 records, engineering 442 records, computer science 228 and physics 211 records and the lowest amount is the field of spectroscopy with 15 records.

Table 3: Type of Scientific Documents Produced by Researchers of Unievrstiy of Birjand

<b>Type of Documents</b>	<b>No.Documents</b>	<b>Frequency</b>
Article	1701	82/73
Conference Article	262	12/74
Meeting Abstract	75	3/64
Review	22	1/07
Correction	10	0/48
Editorial Material	9	0/43
Book Review	1	0/04
Total	2080	100

The findings of Table 3 show that the most type of scientific documents of Birjand University researchers in the years 2000 to 2018 Web of Science database is article with 1701 records (82.73%) and conference paper with 262 records (12.74%).

#### **Frequency Distribution of Birjand University Researchers' Articles in various Journals**

### based on Quartile between 2000-2018

Table 4: Frequency distribution of Quartile journals of Birjand University

Rank	Quartile	No. Journals	Frequency
1	Q1	153	15.8
2	Q2	159	16.4
3	Q3	158	16.3
4	Q4	126	13.0
5	Without Quartile	375	38.6
6	Total	971	100

The findings of Table 4 show that out of a total of 971 journals of Birjand University articles published between 2000-2018 on the Web of Science, 153 (15.8%) first quartile and 159 (16.4%) second quartile and 158 (16.3%) are part of the third quartile and 126 (13.0%) are part of the fourth quartile Journals. Meanwhile, the number of quartile Journals is 375 (38.6%) out of a total of 971 Journals.

### Frequency Distribution of Authors from Countries and Universities that have the most Scientific Cooperation with Authors of Birjand University between 2000-2018 on the Web of Science

Table 5: The level of cooperation of Birjand University authors with other countries in Web of Science in the years 2000-2018

No.	Country	No.Articles	No.	Country	No.Articles
1	USA	62	26	POLAND	4
2	CANADA	48	27	ARGENTINA	3
3	MALAYSIA	33	28	HUNGARY	3
4	UK	29	29	PAKISTAN	3
5	SPAIN	27	30	PORTUGAL	3
6	NETHERLANDS	26	31	SAUDI ARABIA	3
7	AUSTRALIA	23	32	SOUTH AFRICA	3
8	MEXICO	19	33	ALGERIA	2
9	ITALY	18	34	NORWAY	2



No.	Country	No.Articles	No.	Country	No.Articles
10	GERMANY	17	35	SCOTLAND	2
11	FRANCE	16	36	U ARAB EMIRATES	2
12	INDIA	16	37	ARMENIA	1
13	RUSSIA	15	38	BRAZIL	1
14	DENMARK	14	39	BULGARIA	1
15	SOUTH KOREA	12	40	CROATIA	1
16	TAIWAN	12	41	EGYPT	1
17	JAPAN	11	42	GEORGIA	1
18	PEOPLES R CHINA	9	43	GREECE	1
19	FINLAND	7	44	IRAQ	1
20	SWITZERLAND	6	45	IRELAND	1
21	AUSTRIA	5	46	PHILIPPINES	1
22	CHILE	5	47	REP OF GEORGIA	1
23	TURKEY	5	48	ROMANIA	1
24	BELGIUM	4	49	SWEDEN	1
25	CZECH REPUBLIC	4	50	TUNISIA	1

Findings in Table 5 show that the highest level of international cooperation of Birjand University authors in the Web of Science database between 2000 and 2018 was with the United States with 62 records, Canada with 48 records, Malaysia with 33 records and the United Kingdom with 29 records.

Table 6: The level of cooperation of Birjand University authors with other universities in Web of Science in the years 2000-2018

No.	University	No.Articles
1	FERDOWSI UNIVERSITY MASHHAD	217
2	ISLAMIC AZAD UNIVERSITY	208
3	UNIVERSITY OF TEHRAN	72
4	PAYAME NOOR UNIVERSITY	59
5	SHAHID BEHESHTI UNIV	58
6	TARBIAT MODARES UNIVERSITY	43
7	SHAHID BAHONAR UNIVERSITY OF KERMAN SBUK	31
8	SHIRAZ UNIVERSITY	28
9	SHAHROOD UNIVERSITY OF TECHNOLOGY	27
10	AMIRKABIR UNIVERSITY OF TECHNOLOGY	26

No.	University	No.Articles
11	BIRJAND UNIV TECHNOL	23
12	ZABOL UNIV	23
13	BIRJAND UNIV MED SCI	21
14	SHIRAZ UNIVERSITY OF TECHNOLOGY	19
15	UNIV SISTAN BALUCHESTAN	19
16	UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO	19
17	UNIVERSITY OF TABRIZ	18
18	UNIVERSITY OF GUILAN	16
19	SEM NAN UNIVERSITY	15
20	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	13
21	GRIFFITH UNIVERSITY	13
22	K N TOOSI UNIVERSITY OF TECHNOLOGY	13
23	UNIVERSITI TEKNOLOGI MALAYSIA	13
24	UNIVERSITY OF MAZANDARAN	13
25	UNIVERSITY OF NEWCASTLE	13
26	MASHHAD UNIVERSITY MEDICAL SCIENCE	12
27	NATIONAL TAIWAN UNIVERSITY	12
28	SHAHID RAJAEI TEACHER TRAINING UNIVERSITY SRTTU	12
29	SHARIF UNIVERSITY OF TECHNOLOGY	12
30	TEHRAN UNIVERSITY OF MEDICAL SCIENCES	12
31	IRAN UNIVERSITY SCIENCE TECHNOLOGY	11
32	ISFAHAN UNIVERSITY OF TECHNOLOGY	11
33	SISTAN BALOUCHESTAN UNIV	11
34	UNIVERSITI PUTRA MALAYSIA	11
35	MCGILL UNIVERSITY	10
36	UNIVERSITY OF ISFAHAN	10

The findings of Table 6 show that the researchers of Birjand University in the web of science database between 2000 and 2018 had the most scientific cooperation with Ferdowsi University of Mashhad with 217 records, Islamic Azad University with 208 records, University of Tehran with 72 records and University Payam Noor with 59 at the

national level.

## **5. Discussion & Conclusion**

According to the research findings, the share of Birjand University in the production of science at the national level with 1603 scientific records (0.372%) in the Web of Science database during the years 2000 to 2018. It seems that this level of participation in the production of science at the national level is not a good result for the mother university of South Khorasan province, which is also one of the second level universities in the country. One of the reasons for such results is the lack of research plan for faculty members. One of the solutions is to plan for the research program of the faculty members by the research assistant as the custodian of this matter. Reasons for this include poor public awareness and the lack of significant incentive mechanisms over the years.

It seems that holding training workshops and regulations on the right to encourage scientific productions can play a significant role in the growth of this position. Of course, in recent years, appropriate steps have been taken in this direction. Annual monitoring of university scientific products is also one of the effective programs in this field. It is suggested that a scientometric department be set up and the status of university production be monitored continuously.

The highest number of documents produced between 2000 and 2018 in the Web of Science database is the field of chemistry with 552 records, engineering 442 records, computer science 228 and physics 211 records and the lowest amount of spectroscopy with 15 records.

This can be due to the large number of researchers, faculty members and graduate students in highly productive subject areas. Also, the existence of laboratory facilities can be other reasons for this problem. Of course, it should be noted that more scientific productions of a subject field cannot be considered a sign of success or high scientific activities of researchers in that field compared to other fields of human knowledge because this increase can be due to differences in the scientific nature of the field. Be different.

The findings of the study showed that most of the scientific documents of Birjand University researchers in the years 2000 to 2018 in the web of science, type of article with 1701 records (82.73%) and conference paper with 262 records (12.74%). Among the reasons for this, it can

be pointed out that the dominance and interest of researchers in writing the article and also the significant score of articles in promotion can main reason.

Findings indicate that out of 971 journals of Birjand University articles published in Web of Science database, 153 (15.8%) first quartile journals and 159 (16.4%) second quartile journals and 158 (3/3) 16%) are part of the third quartile and 126 (13.0%) are part of the fourth quartile journals. Meanwhile, the number of quartile journals is 375 (38.6%) out of a total of 971 journals.

Considering that one of the indicators for improving the quality of scientific products of any university is the publication of products in prestigious journals, so it seems that those in charge of the research field should monitor and refine the journals of university researchers before publishing in their operational planning. Of course, in this regard, the project of assessing the quality of research journals was carried out with the support of the research deputy department.

The results of the present study showed that the highest level of international cooperation of Birjand University authors in the Web of Science database with the United States with 62 records, Canada with 48 records, Malaysia with 33 records and the United Kingdom with 29 records between 2000 and 2018.

The findings of the study showed that the researchers of Birjand University in the web of science database had the most scientific cooperation with Ferdowsi University of Mashhad with 217 records, Islamic Azad University with 208 records, University of Tehran with 72 records and Payame Noor University with 59 between 2000. 2018 have had a national level.

The main purpose of this study is to know the status of scientific production of Birjand University in the Web of Science database during the years 2000-2018. The results of the present study showed that the situation of Birjand University in terms of scientific production is not in a very favorable position among national and international universities. Since the production of science and its publication in prestigious international journals is one of the main indicators in evaluating the national and international rankings of each university, it is necessary to monitor the status of scientific production of the university continuously.

In order to improve the quality and upgrade the scientific products of Birjand University, the

following suggestions are presented:

- Establishment of scientometrics center in the central library of the university to monitor the status of scientific products, holding specialized training workshops, validation of prestigious international journals and familiarity with other influential indicators in order to improve the quality of scientific products of the university
- Consider measures such as awareness of the faculty members about the internationalization of their scientific products
- Empower faculty members with foreign languages such as English to publish articles in this language
- Planning in order to prepare an annual research plan for university faculty members in order to implement the promotion of quantity and quality of scientific products at the international level
- Documenting and sharing the experience of Birjand University's prolific researchers to strengthen the motivation of other researchers to internationalize the university's scientific products
- Holding workshops to get acquainted with the capabilities of scientific networks such as Research Gate, Academia, LinkedIn, etc. for international interactions and cooperation

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