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Dynamics of Science Development in Azerbaijan 2023-2024 (Primary Scientometric Analysis)

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Abstract. The integration of scientific and information products into the global information space in the Republic of Azerbaijan began with the reforms of 2017. As a result of the measures taken, scientific activities were assessed according to international standards for the first time in 2023. This article is devoted to the study of the work done in the field of determining the national H index in Azerbaijan and the methodology used. The picture emerging with the use of scientometric methods reveals the overall picture of scientific activity in the country and expresses reality. It is also integrated into international scientific information processes, and the system assessment method is used.

Keywords: Development of science, National H-index, Science assessment, Scientometric analysis.

1. INTRODUCTION

An analytical table showing the development of science in Azerbaijan was announced based on the results of 2024. According to this table, the Hirsch index of Azerbaijan is 224 according to Google Scholar, the Hirsch index of Azerbaijan is 180 according to Scopus, and the Hirsch index of Azerbaijan is 160 according to Web of Science. Each of the indicators can be analyzed in detail, but the main thing is that the overall average is five times higher than expected. These indicators reflect the overall picture of the development of science in Azerbaijan.[1] According to scientific directions, "data analysis" is needed to determine a specific picture.

Table 1.

1	**Degree in global scientific production**	**161**	**81**	**138**	**20**	**194**	**96**
2	Degree in scientific production of the Organization of Islamic Cooperation	45	18	40	1	53	23
3	World rate citation	142	112	145	29	-	23
4	Rate citation Organization of Islamic Cooperation	39	31	40	2	-	33
5	Average broadcast of world scientific output	0.00	0.03	0.00	1.19	0.00	0.02
6	Average broadcast of scientific products of the Organization of Islamic Cooperation	0.03	0.72	0.13	28.36	0.02	0.82
7	Average H-index indicator	27	68	27	275	23	75
8	Growth rates	29.85	13.32	11.22	11.72	1.64	2.75
		Azerb.	Qazax	Qirgiz	Turkiy	Turkm	Uzbek

(The table presents an analysis of data up to 2017)[2]

In 2018, a surprise in the overall picture of Azerbaijan was also the table of foreign experts (Iran), which determines the dynamics of scientific development in 1997-2017. In this table, the average Hirsch index of Azerbaijan was 27, and according to the world citation rating, it was in 145th place. Those who were engaged in academic activities saw and understood that these figures did not reflect the overall academic picture of Azerbaijan. Until scientific journals published in Azerbaijan were integrated into the digital space, and the scientific works of our scientists were not indexed in reputable journals, it was impossible to determine an objective point of view. Finally, the work carried out bore fruit, and the National Hirsch Index was announced from the beginning of 2023. The National Hirsch Index Rating is a scientific and information service, and it should be noted that this is a very expensive service. I think that this was implemented on the basis of the "road map" of the Cabinet of Ministers of the Republic of Azerbaijan in order to intensify scientific activities.

"National Hirsch Index of Azerbaijan" is an independent international ranking aimed at assessing the scientific productivity of Azerbaijani scientists, research groups and organizations based on the Hirsch index, consolidated on the basis of three indexed databases considered authoritative in the world.

It takes into account the overall Hirsch index of scientific institutions of Azerbaijan, referring to data obtained from scientific metric databases and platforms such as Scopus, Web of Science and Google Scholar. Based on this data, the National Hirsch Index Rating indicator is determined and the positions corresponding to the ratings are ranked.

It is gratifying that with the use of this methodology, Azerbaijani scientific and educational institutions are integrated into the global scientific information space and the assessment is carried out according to

[1] Kazımi, P. F. (2017). Sosyal ve Kültürel Ortamın Oluşmasında Kitap ve Kütüphanelerin Rolü. *Türk Kütüphaneciliği*, *31*(2), 245-250.
[2] Milli H-indeksi reytinqinin" 2024-cü il üçün nəticələri. https://crossmedia.az/az/tehlil/sosioloji/milli-h-indeksi-reytinqinin-2024-cue-il-uecuen-n-tic-l-ri

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internationally recognized standards. The first assessment list was published in February 2023, and the indicators for the fourth quarter of 2024 are currently being published. This list clearly shows the dynamics of scientific activity over two years.[3]

Currently, the H index is used to measure the value of scientific information (scientific opinion). It is mainly a statistical measurement method used to evaluate scientists or knowledge. It is determined by the ratio of citations to scientific articles proposed by the Argentine chemist Gersh in the 1970s. This calculation model has not changed to this day and is considered the most reliable calculation rule. Although different methods are used in a number of countries, the H index remains the main indicator.

The H index is designed for research scientists, scientific journals and scientific articles. The Hirsch index of scientists and researchers is summarized and the Hirsch index of the department, laboratory, research center is determined, the Hirsch index of the department is collected and the Hirsch index of Research Institutes and Universities is determined, and at the last stage, statistics of scientific institutions are collected to determine the Hirsch index as the scientific potential of the republic. This is the initial assessment. At the next stage, a map of the development of science is compiled and modern scientific analyses are carried out. All scientific and educational institutions of the republic have not yet been included in the assessment of the "National Hirsch Ranking of Azerbaijan 2023". There is probably a reason for this. With the inclusion of all institutions engaged in scientific activities in this assessment list, the academic rating indicators of the republic will increase in the near future. Also, scientific and educational institutions will pay more attention to professionalism in the selection of specialists, differentiated assessment of scientists and researchers will be applied, and academic cooperation will expand.

This rating table includes 96 scientific and educational institutions of Azerbaijan. Of these, 40 are higher schools, the rest are research institutions. 73 institutions are ranked by scientific indicators, 11 enterprises are included in the list without participation. In order to improve the scientific rating of the republic, it is important that every enterprise is included in this table.

Since the application of this assessment method has just begun, in the coming years we will see a dynamic growth of indicators. To do this, it is necessary to conduct presentations and trainings with the scientific community of the republic on the methodology of scientometric work, the creation of profiles of scientists and the correct placement of scientific information products. Conducting such trainings, familiarization with the assessment methodology and general participation in scientific information platforms can significantly increase the National H.

Currently, the "National Hirsch Index" not only reflects the real picture of academic activity in Azerbaijan, but also plays an important role in determining our place in the world academic processes, determining and assessing the dynamics of development. There is no method that shows reality more accurately than this one. The assessment model used by the developers is noteworthy. The enterprises included in the top ten are called "leaders of scientific potential", and ANAS logically tops the list. Baku State University ranks first among higher education institutions. BSU's indicators are very prestigious and can compete with many European universities.

Scientific institutions occupying 11-30 places in the ranking are defined as institutions expressing "high scientific potential". These are universities that have really serious academic indicators, are competitive, and the real dynamics of development can be seen in the ranking table.

Some universities achieve high indicators by attracting foreign specialists to their staff. Although some universities have high indicators, they are not included in the assessment, since they are not reflected in prestigious academic platforms.[4] Some universities, having consolidated their existing potential over the year, have significantly improved their positions in the published ranking table.

The third part of the assessment is called "rating participants" and includes various scientific and educational institutions, large and small. Promising enterprises are also located here. For some small scientific institutions, participation in this rating should be considered a great achievement.

There is also talk about artificial interference in these processes. It should be noted that the first two named databases - "Scopus" and "Web of Science" are closed systems and any external interference is impossible. The third indexing base, Google Scholar, operates in an open system mode and, theoretically, outsiders can interfere with its work. However, artificial figures and fraud can be easily identified as a result of monitoring. Therefore, the reliability of the figures can be trusted.

Table 2.

Database	2023	2204
Scopus	166	180
Web of Science	145	160
Google Scholar	186	224

[3] Azerbaijan National H-index Ranking 2024. https://az.h-index.com/az

[4] *Role of Books and Libraries in Creating Social and Cultural Environment*. *Kazimi, PF. 2017. TURKISH LIBRARIANSHIP 31 (2), pp.245-250.*

The table is based on the national H-index table (2023-2024)[5].

The figures presented in the table, in addition to demonstrating a fairly dynamic development, are in themselves authoritative figures and are completely different from the results compiled in 2017.[6] Also, the overall picture of dynamic development across all three databases shows that the process is promising.

As can be seen from the table, the top ten rankings include five research institutes and five universities. The national h-index of these institutions is added to the results obtained from the Scopus and Web of Science databases, half of the results obtained from the Google Scholar database, and divided by three.

2. CONCLUSION

In the list of "TOP-1000 scientists" of the table, Faig Akhmedov from the Institute of Physics -National Academy of Sciences of Azerbaijan (ANAS), Mais Suleymanov from Baku State University are in the lead. The number of works of these scientists and scientific references to them is very large. Looking at the picture in the rating table, you inevitably feel proud of these scientists. First of all, the definition of the lists of the "National Hirsch Ranking of Azerbaijan" is a serious motivation for scientists and researchers and creates, in a good sense, a healthy environment for organizing academic competition in the republic. It is likely that the methodology used will be gradually updated. In world practice, the requirements for the H index in the exact and social sciences differ. The assessment should be grouped by natural sciences, social sciences and industry research institutions. The latest published rating table included the Azerbaijan Medical University and a number of other medical institutions.[7] Probably, in the future, the spheres of medicine and healthcare will be assessed separately. It will also be necessary to separately assess the social and humanitarian spheres and apply the internal tools of the republic. In this direction, the experience of Russia and Turkey can be studied. It is important to evaluate applied and fine arts separately.

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