Cooperation in science and the possibilities of its evaluation based on data from the CRIS database

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Extended abstract

Currently, there is no doubt about the importance of cooperation in science and research and its positive impact on the achieved results. Cooperation is a relatively broad term, and this fact is also reflected in the parameterization of indicators focused at scientific cooperation in the evaluation of science. The goal of our research was to find out how it is possible to analyse cooperation in science and research. At the same time, we wanted to confirm the hypothesis that the CRIS system and its data model enable working with data about the collaboration in science and research.

We primarily focused on the formulation of indicators for which the data can be obtained from the CRIS system. However, scientific citation databases such as Web of Science and SCOPUS also provide great opportunities for mapping cooperation in science.

The second research task was the evaluation of the obtained information at the national level. Our goal was to identify the extent and directions of cooperation in research between different organizations.

The issue of cooperation in science and research is theoretically very well developed and its investigation has a long history. Science and cooperation within it as a separate field is the subject of investigation of special scientific disciplines. Sciabolazza et all [1] mentions new scientific disciplines: Science of Team Science and Science of Science.

The literature deals with scientific cooperation from different points of view. It is interested, for example, in the advantages and disadvantages of cooperation in science [2] or in the correlation between the degree of cooperation in research and its novelty. [3]

We can categorize and evaluate cooperation according to various criteria. For example, Sonnenwald [4] presents the following breakdown:

- Disciplinary Focus (Intradisciplinary, Interdisciplinary, Transdisciplinary)

- Geographic Focus

- Organizational and Community Focus

Interdisciplinary cooperation is often emphasized and analysed [5], but also international cooperation and cooperation between the academic sector and the business sector. [6] Some indicators monitoring the type and level of cooperation are also used in internationally recognized systems for evaluating science [7].

In the past period, data and indicators were identified in Slovakia that can be used to monitor the success of the transfer of scientific knowledge into practice. It also concerned data on cooperation, such as the participation of organizations in research projects, the number of co-researcher organizations, international cooperation, etc. [8] These indicators were already based mainly on data collected and available within the SK CRIS information system.

In our research, we based our research on available theoretical sources and examples of best practice and established the following procedure:

1. In the first step, it was necessary to identify the data about cooperation in available data on science and research. We focused on the information system about science and research SK CRIS. This system contains the data about cooperation in project activities. Then we use one of scientific citation databases, namely Web of Science (WoS) to analysing cooperation in the field of publication activity.

2. In the second step, we focused on the structure, quality and complexity of the available data. The intention was to know whether they are usable for our research.

3. In the third step, we formulated indicators for the evaluation of cooperation in science. Of course, the condition was that we had quality data available for these indicators.

The selection of indicators was as follows:

- Cooperation between two different organizations

- Identification of research consortia

- Academic and private sector cooperation on projects and publications

The result is a case study that clearly characterizes several types of cooperation. The first is the cooperation of two different universities on projects and publications in a selected period of time. The second part of the study identifies research consortia active in solving projects in a specific time period. We have also identified the most active private sector organizations that have collaborated with the academic sector on projects and publications.

When analysing the data, we discovered several facts:

- As part of the evaluation of the cooperation between the state and the private sector, we must note the long-term weak involvement of the private sector in solving research projects. Out of the total number of projects solved in 2022, the business and non-profit sector participated in the solution of 322 projects, which is 7.55% of all projects. However, the rate of cooperation between the private sector and the state sector reaches around 40%.

- When examining research consortia, we focused on the academic cooperation of universities, but also the intersectoral cooperation of the academic and private sectors. Consortia are formed not only depending on the overall project activity and size of the university, but also between universities with different focus, as well as between universities with similar focus in different regions. The cooperation between the Comenius University and the Slovak Technical University (44 joint projects), which are the two largest universities in Slovakia, dominated. As for intersectoral cooperation, the most intensive in the monitored period was surprisingly in the field of wood sciences (5 joint projects of a consortium of private and academic institutions). However, given the level of involvement of the private sector in project solutions, we do not have a large enough representative sample, and therefore the results may not be sufficiently informative.

- We have identified more than 20 private sector organizations that solved at least one project in 2022 and simultaneously published in WoS in the period from 2019. Looking at the results of the analysis of the project and publication activity of private research organizations, we note that there is no clear correlation between project and publication activity. However, it can be stated that, with a few exceptions, private sector organizations cooperate to a large extent with the academic sector on the publication of research results.

In conclusion, it can be concluded that the CRIS system, filled with high-quality and complete data, can also be used for the analysis of cooperation in science and research. Particularly interesting results can be achieved by combining data from the CRIS system and from the scientific publication database, which underlines the importance of the interoperability of different data sources.

Resources:

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