

The indexing of scientific knowledge: The need for knowledge at the service of community development and nature protection

A indexação do conhecimento científico: a necessidade do conhecimento a serviço do desenvolvimento comunitário e da proteção da natureza

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ABSTRACT

The pandemic, the economic crisis, and climate change impose new development models of scientific production, as we suggest in this perspective study. The authors propose “new ways of evaluating academic performance,” which means stopping exclusively rewarding researchers who publish in indexed journals and valuing work with communities and applied interdisciplinary research, aimed at understanding socioenvironmental problems and proposing possible solutions that improve academic performance, improve quality of life of the population, and protect nature.

Keywords: publish or perish; social impact; productivism; scientific colonialism.

RESUMO

A pandemia, a crise econômica e as mudanças climáticas impõem novos modelos de desenvolvimento da produção científica. Propomos “novas formas de avaliar o desempenho acadêmico”, o que significa deixar de premiar exclusivamente pesquisadores que publicam em periódicos indexados, mas valorizar o trabalho com comunidades e a pesquisa interdisciplinar aplicada, visando compreender problemas socioambientais e sugerir possíveis soluções que melhorem o desempenho acadêmico, a qualidade de vida da população e a proteção da natureza.

Palavras-chave: publicar ou perecer; impacto social; produtivismo; colonialismo científico.

Introduction

Scientific thought, which emerged in modern times, was developed and strengthened, especially with the European intellectual movement of the enlightenment, and has contributed significantly to the clarification of multiple problems of modern life, which has been expressed in progress and quality of life. However, science is not without its mistakes. This has happened when it is oriented too much by positivist paradigms and when knowledge — located in the academy

— is exploited by projects that do not consider human rights or the laws of nature, as is the case in the Anthropocene Era, in which we find ourselves. Currently, we debate local and global multiple crises (Rojas, 2013), to which the pandemic is added.

The problem is not science itself, as knowledge creation and innovations. Nor is it about the researchers or academics who generate knowledge or produce innovative technologies. The difficulty lies in public or private scientific policies, in the way scientific knowledge is

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Conflicts of interest: the authors declare no conflicts of interest.

Funding: FONDAP CRHIAM ANID/FONDAP Center 15130015; Center for Environmental Sciences EULA-Chile of the University of Concepción, and the Instituto Milenio SECOS ANID-ICN 2019_015.

Received on: 09/09/2022. Accepted on: 10/10/2022.

<https://doi.org/10.5327/Z217694781470>



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promoted and used. The problem also lies in the management, volume, orientation, and prioritization of the funds dedicated to research. It also depends on the criteria and indicators that are defined to measure and evaluate scientific productivity and academic careers. For example, the neoliberal model encourages and prioritizes individual creation and the establishment of indexed indicators of productivity in the knowledge market: science is placed in a certain sphere of the division of labor; it is subtracted from the necessary applicability and locked up in the unattainable heights of abstraction and false neutrality. This neoliberal and neo-extractive concept corresponds to an ideological model, a way of avoiding its comprehensive role and its transforming potential. It is consciously deprived of its enlightening and emancipatory capacities, intrinsic to scientific rationality. In short, researchers are required to produce goods packaged in indexed knowledge, regardless of their social and critical sense.

In the past 30 years, this practice has been implemented intensively in the Chilean university system and globally. We refer to scientific production measured through two fundamental indicators: the number of indexed publications (Web of Science and Scopus, both from private companies) and the number of citations to the said publications. Both constitute the measure of the impact of scientific activity, and this translates into a personal quality rating index, the Hirsch index (H), which reflects the number of times an article within the individual scientific production is cited. Obviously, the higher this index, the better the quality of scientific production. However, this approach is increasingly being challenged and criticized and is being reviewed internationally (see DORA, <https://sfdora.org>, or the Leiden Manifesto, Hicks et al, 2015).

These trends were driven by the “publish or perish” policy that has been implemented in the world’s universities in recent decades, which has also meant an increase in the rate of publications throughout the Latin American region, but not with sufficient quality, since the number of citations per publication still remains low, in many cases due to the poor quality of what is published and the low value that peers attribute to Latin American papers. As Fernandes (2022) indicated in a previous perspective in this same journal, a distortion occurs, where quantity matters much more than the quality of what is published.

In this viewpoint, we address the impact that this way of measuring academic work has had, since it has circumscribed the work of researchers to a logic of competence and individual results. It corresponds to a privatizing logic of knowledge, despite its imminent public nature. In general, knowledge is a social construction. Basically, knowledge is a common good that historically accumulates and evolves in its interaction and permanent renewal in the dynamic processes of the changing reality of modern society in regional and global contexts. For this reason, we believe that it is necessary to begin to value and recognize collaborative, applied, interdisciplinary work and its bidirectional link with the environment, putting it on par with indexed scientific production. In other words, in addition to publishing only in indexed

form, it is necessary to promote other ways of evaluating academic performance and valuing the work that is done in the social, environmental, and artistic sciences and the humanities, also in collaboration with the natural sciences.

Scientific neo-extractivism or externalization of knowledge

Today, the demands for being a full professor in Chilean and Latin American universities are higher than 30 years ago, but the criteria remain the same: excellence in academic work, peer recognition, and scientific production measured through the indicated parameters, which are increasingly demanding, outsourced, and alienating. If before, for example, publishing a couple of articles a year was considered outstanding, today an active scientist should publish at least five articles a year, hopefully in the journals of the discipline with the greatest possible impact, to be considered competitive in funding institutions of scientific activity. This is because if there is a distinctive feature in the production of papers, it is that it is closely linked to the financing of research activity, which is certainly very competitive, particularly in the funds that allow individual applications, for example, FONDECYT in the Chilean case or the CNPq in Brazil.

Undoubtedly, the communication of the advancement of scientific knowledge occurs through the publication of papers in specialized journals. However, there are also other mechanisms, for example, the production of books, popular articles, and artistic works. The latter, since they are evaluated differently, do not enter the system and are, in practice, undervalued. Thus, for example, the National Accreditation Commission (CNA) measures academic scientific production through indexing indicators. These parameters weigh decisively on the formal trajectory and progress of the academic career (to advance from being an instructor to a full professor), which also constitutes a denaturation and external intervention of the academic career and, therefore, of university autonomy.

Nevertheless, the question we ask ourselves in this viewpoint is: where does the knowledge generated in universities and by researchers go, mostly financed by the state, with resources, provided by society as a whole? The answer is clear: for the most part, it goes to indexed journals from large publishers, to which we Latin American scientists assign the rights. These publishers charge for access to our scientific production after a rigorous international peer review process, which evaluates the merit of the articles. The other alternative that has emerged is open-access publishing, where the author(s) pay a publishing fee when the manuscript is accepted. In other words, a true commercial industry has been created around the papers, which operates with market logic, since you must pay to have access. There are, however, indexing with a more academic and public sense. For example, the SciELO and LATINDEX journals bring together and promote scientific journals in the Latin American region.

The above process can be defined as scientific neo-extractivism: knowledge is exported or outsourced, in the same way as it is done with raw materials from developing countries (Acosta, 2011; Martínez Alier, 2015; Gudynas, 2016; Svampa, 2011). In this case, however, we are dealing with both elaborate and common goods. The researcher is placed in a specific function of the division of labor, and the more quality scientific goods he exports (measured by the level of impact of the journals in which he publishes), the greater his productivity, prestige, and academic career will be. Therefore, there are better chances of winning new projects and increasing productivity and academic prestige. In short, the researcher accumulates merits in the academic market. This constitutes a modern form of private alienation of scientific work. This trend, however, removes scientific production from the sphere of public service, as it was before and as it is maintained in developed countries where, through research, scientists add value to what they produce, to their institutions, and to society.

Now, an indexed article in environmental sciences, published in Chile, is cited on average 18 times (Clarivariate, 2020). Should our effort then be focused on publishing papers that are not widely read? In fact, these indexed publications, in many cases, are outside the reach of the localities in which the researchers themselves produce them, or there is no public access when it comes to reserved or simply private information.

Chile has quadrupled the number of indexed scientific publications in recent decades, but this has not necessarily meant that our science deserves the respect of the national community. Indeed, Chile currently invests approximately 0.36% of its gross domestic product (GDP) in research and development (R&D) (OECD, 2020). There is consensus that this figure is very low, given that it is very far from the OECD average (2.34%) and even well below what Latin America invests (0.7%). In addition, it is recent data that scientists have incorporated into national commissions (with high participation of researchers from the Metropolitan Region) together with the recent creation of the Ministry of Science, Technology, Knowledge and Innovation and the new National Research and Development Agency (ANID). The current government headed by Gabriel Boric has promised to increase spending on science: to reach 1% of the GDP by the end of his mandate, which would undoubtedly be progress, but still insufficient for the needs of adding value to production, institutions, knowledge of ecosystems, and, in general, society.

For public policies, however, it would be important that the results of scientific research also have applications to improve the well-being and quality of life of people, the protection of the environment, and sustainable development. In this area, as a scientific community, we must and should progress more boldly in pursuing sustainable development goals when doing publicly funded, mission-driven research. This also implies a change in the policies of the institutions that promote and finance research. This does not mean that curiosity-based

science should be pushed aside, but incentives should be put into different ways of evaluating performance and of doing science and developing technologies. Scientists must also listen to politics and their demands and develop a more effective interaction between science and politics (Barra, 2020).

However, not all researchers agree with this neo-extractivist system of scientific productivity and measurement of academic trajectory. In fact, many reject it or do not accept it, even though they are forced to submit to its techno-bureaucratic rules of a neoliberal nature. For this reason, many combine experiences: they publish in indexed journals and, at the same time, apply knowledge; or they join citizen science initiatives. In some cases, including international calls and evaluations, as is the case of the FONDAP Center for Water Resources for Agriculture and Mining, CRHIAM — where we are researchers — applied science and knowledge socialization are required in various forms, not only indexed articles. It also occurs with other centers, such as the EULA Center and research projects at various Chilean universities.

Producing knowledge at the service of community development

In the current context of the debate on suitable development alternatives to get out of the multiple crises that affect the country and the world, not only is a rapprochement and collaboration possible between those who are vocationally dedicated to producing knowledge and new technologies and traditional knowledge and practices of the communities, but it is highly desirable, necessary, and essential. Thus, for example, regarding water resources, there are many local experiences, knowledge, and traditions of good management and governance based on the collaboration of diverse actors. There is also much research and new knowledge to make use of water more efficiently in agriculture, mining, industry, and in cities, as well as in the collection of rainwater, recharge of groundwater, and reuse of water. In this regard, water harvesting represents an example. This process of capturing water from the capturing mist, or Camanchaca, produced in coastal areas, has made it possible to supply water to the population, maintain animal needs, and irrigate crops, traditionally in the north of Chile (Atacama), and experience the harvesting of rainwater in the south of the country.

To unite local endogenous experiences and knowledge, it is required that the researcher lowers the “Ivory tower” and accepts the existence of spaces of cooperation between their theories and traditional social practices that are also made of knowledge and lore. Both areas of knowledge, inter-knowledge, implicit in the ecology of knowledge concept, expressed as inter-knowledge by Boaventura de Sousa Santos (2010), have contributed to a better understanding of the times of mega-droughts and global climate change that we live in, which can result in the construction of a better society and partially curb the disastrous and threatening impacts of climate change: post-Anthropocene, post-growth, and post-pandemic transformative strategy, with a better qual-

ity of life and protection of ecosystems. We are moving toward a mode of interspecies coexistence.

Chile, an emerging country, has enormous capacities and potentials to advance toward its own sustainable development, promoting the creation — or recreation — of an inclusive social state that covers the basic needs of all Chilean men and women, trusting in its citizens, and renewing its public institutions. In truth, all Latin American soci-

eties have scientific, territorial, local knowledge, political, and citizen potentials to advance in a sense of sustainability. In addition, the current economic, social, and political crisis that the world is experiencing requires that our countries turn their gaze toward their own capacities in order to reorient their development models. Precisely in this sense, universities and researchers can make a relevant contribution in a synergistic alliance with society, regional territories, and their institutions.

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