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PROTOCOL

Information literacy and open science: scoping review protocol

Alfabetización informacional y cienciaabierta: protocolo revisión de alcance

Literacia da informação e ciência aberta: protocolo de revisão de escopo

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Abstract

The aim is to map, within the specified database, the evidence on information literacy concerning open science over the last five years. The scoping review proposed here will follow the methodology of the Joanna Briggs Institute (JBI) and PRISMA-ScR. To access articles, we used the CAPES (Coordination for the Improvement of Higher Education Personnel) Journal Portal, published between January 2018 and August 2023. The following inclusion criteria will be used: articles that report the role of information literacy in Open Science. Studies will be selected on the Rayyan platform by two independent reviewers. Data will be extracted using a data extraction form developed by the reviewers themselves and will be presented through figures and tables, with a narrative summary accompanying the illustrations, according to the objective and review questions.

Descriptors: Open Science; Literacy; Learning; Open Access; Research.

Resumén

El objetivo será mapear, dentro de la base de datos especificada, la evidencia sobre alfabetización informacional en relación con la ciencia abierta durante los últimos cinco años. La revisión exploratoria propuesta aquí seguirá la metodología del Instituto Joanna Briggs (JBI) y PRISMA-ScR. Para acceder a los artículos, se utilizó el Portal de Revistas CAPES (Coordinación para el Perfeccionamiento del Personal de Educación Superior), publicado entre enero de 2018 y agosto de 2023. Se utilizarán los siguientes criterios de inclusión: artículos que informen sobre el rol de la alfabetización informacional en la ciencia abierta. Los estudios serán seleccionados en la plataforma Rayyan por dos revisores independientes. Los datos se extraerán mediante un formulario de extracción de datos desarrollado por los propios revisores y se presentarán mediante figuras y tablas, con un resumen narrativo que acompaña a las ilustraciones, de acuerdo con el objetivo y las preguntas de la revisión.

Descriptores: Ciencia Abierta; Alfabetización; Aprendizaje; Acceso Abierto; Investigación.

Resumo

O objetivo será mapear na base especificada as evidências da literacia da informação, em relação à ciência aberta nos últimos cinco anos. A revisão de escopo aqui proposta seguirá a metodologia do *Joanna Briggs Institute* (JBI) e o PRISMA-ScR. Para o acesso aos artigos utilizamos o Portal de Periódicos da Capes (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) publicados no período de janeiro de 2018 a agosto de 2023. Serão utilizados os seguintes critérios de inclusão: artigos que relatem o papel da literacia da informação na Ciência Aberta. Os estudos serão selecionados na plataforma Rayyan por dois revisores independentes. Os dados serão extraídos usando um formulário de extração de dados elaborado pelos próprios revisores, e serão apresentados por meio de figuras e tabelas, com resumo narrativo acompanhando as ilustrações, conforme o objetivo e perguntas de revisão.

Descritores: Ciência Aberta; Literacia; Aprendizagem; Acesso Aberto; Investigação.

Introduction

The relationship between science and society is fundamentally dynamic and interactive. Science contributes to social transformations and, at the same time, is influenced by the impact it causes on society, which reorients it in search of new paths and challenges, leading to answers to new hypotheses and the generation of new knowledge[1]. In this scenario, information literacy addresses the process of scientific communication, information evaluation, and dissemination of research results. Open science strengthens understanding of issues associated with data management and curation. Therefore, it is related to the cycle of scientific evaluation, information assessment, and dissemination of results.

We can say that scientific communication has as its main objective the sharing of specialized and secure information among peers with the aim of making the advances achieved known in the scientific and academic community[2]. Communication is fundamental to the concreteness of science. Disseminating results is not an add-on, but an essential part of this work, being inseparable activities. The process of scientific research, in any field of knowledge, is only complete when it is communicated[3].

Sharing scientifically produced content fulfills a primary function: democratizing access to knowledge and establishing conditions for information literacy, while also fostering the inclusion of citizens in the debate on specialized topics that can impact the health, work, and economy of society as a whole[4].

Literacy's role in higher education, through open dialogue with other knowledge systems and the application of academic and information skills based on open science principles, translates into a collaborative and transparent dissemination strategy, leveraging knowledge transfer and its practical use for the benefit of individuals and society. For the United Nations Educational, Scientific, and Cultural Organization (UNESCO), literacy involves lifelong learning that enables individuals to achieve their goals, develop their knowledge and potential, and participate fully in society[5].

In the international community, this topic is of such great importance that International Literacy Day was established, celebrated annually on September 8th since 1967, after being initially proclaimed by UNESCO in 1966. This day aims to highlight the importance of literacy for all—individuals, communities, and societies. International Literacy Day was proclaimed by Resolution No. 73/145 adopted at the General Assembly of the United Nations (UN) on December 17, 2018[6].

Open Science is more than just open access; it truly is the opening of the scientific process, reinforcing social and scientific responsibility, and transferring scientific knowledge to society. This dynamism poses a challenge for this type of science—information literacy—since the training requirement involves linking information literacy with Open Science as the foundation for training and developing new skills. Information literacy, also known as information literacy, involves the ability to seek, evaluate, use, and communicate information critically and effectively. This is crucial in a world where a vast amount of information is available online and offline[7].

Open science infrastructure enables greater engagement between the scientific community and other social actors. It's even said that information literacy is the first step toward open science, as it involves researching, locating, selecting, evaluating, and using information ethically and legally. It then researches, organizes, and communicates. However, for this to happen, knowledge, skills, competence, and strategic capacity are required.

Training is fundamental to producing new knowledge; therefore, the discussion of open science is important, especially in the academic field, and should therefore be included in study plans.

Fundamental areas of open science that should be explored by information literacy: modus operandi of the scientific process, dimension of the scientific information process, organizational structure of open science, academic information shared internally and externally[8]. Academic social networks have increasingly occupied more space in this universe and can be considered as new forms of academic and scientific communication, bringing with them greater opportunities for interdisciplinarity in science.

Information literacy has the challenging task of teaching scientific information literacy to society and undergraduate and graduate programs, as an individual without information literacy skills cannot assess credibility. A person without access to databases and journals cannot find references to evaluate or understand how an article fits into a research study.

Scientific information literacy is a central component of the scientific process. Stronger scientific literacy and greater access to academic research would more effectively contribute to the development of individuals with critical thinking skills, enabling them to contribute to potential social transformations[9].

Employing information literacy to empower citizens to access, evaluate, and use information results in greater autonomy in decision-making. The importance of understanding the concept of literacy emerges as a key factor in self-care, encouraging individuals to take a central role in their information management[10].

During the data collection on this topic conducted on the Virtual Health Library (VHL) portal, the Medical Literature Analysis and Retrieval System Online (MedLine), the Latin American and Caribbean Literature in Health Sciences (LILACS), and the Nursing Database (BDENF) databases up to May 31, 2023, no publications were found that addressed aspects related to the topic of interest. This comprehensive analysis was essential to verify the relevance of the research, highlighting the current gap in the scientific literature available in these specific sources up to that date.

Given this context, a study is needed to clarify information literacy in Open Science, aiming to strengthen the global visibility and impact of research published by journals. The choice to focus exclusively on databases like the Capes Journal Portal is justified by the fact that it was a pioneer in joining the Open Science movement in 2017. This provides a targeted approach to the current state and

prospects for implementing and communicating Open Science research.

Considering this question, this study aims to: map, in the specified database, the evidence of information literacy in relation to open science in the last five years.

Methodology

Study design

To achieve the proposed objective, based on the research question, the scoping review methodology was used, which is a type of systematic review, mapping concepts and findings related to the topic of interest, available in the main data sources, using a knowledge synthesis approach[11].

Protocol and registration

The protocol will be developed according to the scoping review guidelines contained in the methodology manual published by the Joanna Briggs Institute (JBI) for Scoping Reviews and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)[12-13]. The review is expected to take two months to complete. The review protocol is registered on the Open Science Framework (OSF) platform and can be accessed at: https://doi.org/10.17605/0sf.io/2DA6H.

Introductory to the protocol, a search was carried out for review articles already published on the topic: open science, literacy, information, with a search strategy that will be developed based on descriptors raised in the Health Science Descriptors in the period from 2018 to 2023.

Research question

The formulation of the guiding question was based on the mnemonic PCC (Population, Concept, and Context): "What scientific knowledge refers to information literacy in Open Science?".

Population

Studies, research, articles, and scientific literature related to information literacy in Open Science will be considered.

Concept

Studies addressing information literacy in Open Science will be included. This research will explore the main foundations of the topic in question, assess the size, scope, and nature of the study, and condense and publish the data, highlighting existing research gaps. Identify points related to scientific information literacy.

Context

This review will consider the context in which information literacy in Open Science is discussed. This may include different scientific fields, research institutions, and contexts within the scientific communication cycle, information evaluation, and dissemination of research results. Therefore, all studies that addressed this context, along with the concept, will be included in the search.

Eligibility criteria

Inclusion criteria: articles published between January 2018 and August 2023, in English, Portuguese, or Spanish. Peer-reviewed and open access. Exclusion criteria: articles on open science that do not converge with the topic of information literacy.

Research strategy

To access the research articles, the Capes Journal Portal (Coordination for the Improvement of Higher Education Personnel) published between January 2018, and July 2023 (the last 5 years) was used. The descriptors used were in English "Open Science" AND "Information" AND "Literacy" and Portuguese: "Ciência Aberta" AND "Literacia" AND "Informação" (Chart 1).

Chart 1. Review articles identified in the database. Rio de Janeiro, RJ, Brazil, 2023

Search strategy	Capes Periodicals Portal	Findings	Excluded	Met the inclusion criteria
"Open Science AND Literacy AND Information"	74	35	22	13

Study selection

The selection of material on the topic will be carried out, initially, with the help of the Rayyan CQRI Systems reference management system[14]. By exporting the files containing the literature found in each information source, two reviewers will independently remove duplicate material and then read the abstracts of the remaining texts, assigning acceptance or rejection ratings to each according to the defined inclusion and exclusion criteria, ensuring a blind review process. Any disagreements that arise will be resolved by a third reviewer. After this stage, the resulting texts will be read in full and analyzed according to the defined inclusion and exclusion criteria. Texts deemed acceptable at this stage will be selected for data extraction. The study selection process will be conducted by three independent researchers, and in the event of disagreements, a fourth researcher will assist in the final decision on whether to include the study.

Data extraction

To extract the data for this review, the reference list from Rayyan will be exported to a Microsoft Excel 2016 spreadsheet and will include details of the population, concept, context, and main results. The instrument

developed by the reviewers, based on the JBI manual model and outlined in Chart 2, will be used. Data extraction will be performed independently by two reviewers. Finally, the results and points of divergence will be analyzed by a third reviewer.

Chart 2. Data extraction. Rio de Janeiro, RJ, Brazil, 2023

Source	Title	Year	Language	Identifier	Study Type and Design	Context	Objective	Main Results	Conclusions and Gaps

Data analysis and presentation

The presentation format for the results will provide an overview of scientific knowledge related to information literacy in Open Science. To this end, a summary will be prepared containing the main results. Figures, tables, and charts will be created to portray the findings and meet the review's objectives. The data will be organized and categorized according to their content. The research results will be presented according to PRISMA-ScR and will be disseminated to the academic, scientific, and library communities.

Expected Results

There are no ethical issues of concern, eliminating the need for ethics committee review. The expected results include mapping scientific production on information literacy in relation to open science between 2018 and 2023.

These results could inform health literacy techniques and approaches. The synthesis of the evidence generated will enable a more detailed and up-to-date understanding of trends, gaps, and knowledge development in this area, providing a solid foundation for guiding future research and practices at the intersection of Open Science in undergraduate and graduate programs.

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