

Proposal of a conceptual matrix to present the state of the art of a research to based on the systematic literature review methodology

Propuesta de una matriz conceptual para presentar el estado del arte de una investigación a partir de la metodología de revisión sistemática de la literatura

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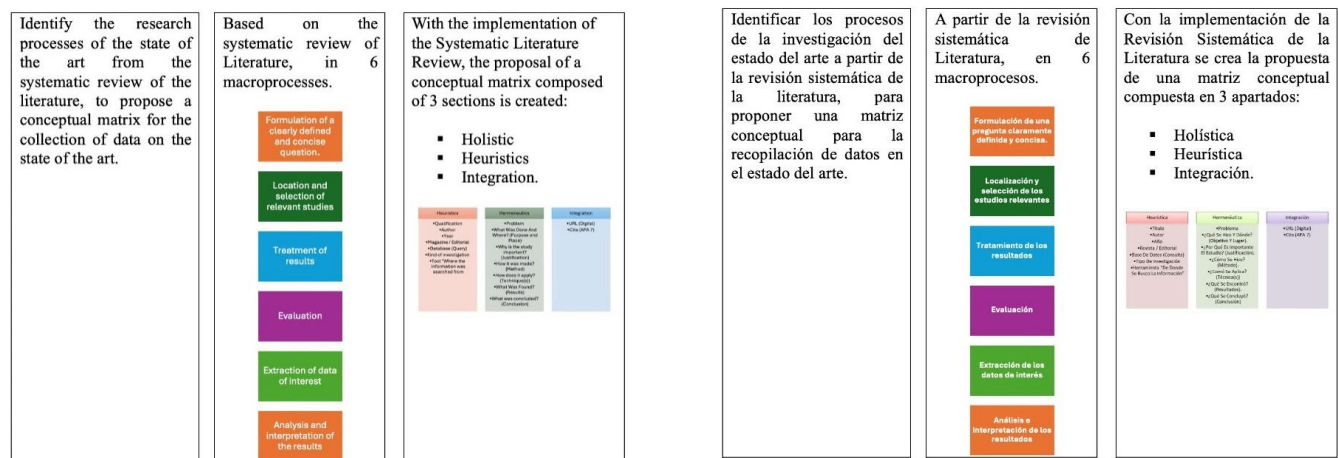


Abstract

This article presents a proposal for organizing literature in a visual sieve based on a conceptual matrix based on the application of the Systematic Review of Literature methodology and integration of information within the three phases of the scientific method of research to manage a state of the art or state of knowledge.

Resumen

En este artículo se presenta una propuesta de organización de la literatura en un tamiz visual basado en una matriz conceptual a partir de la aplicación de la metodología de la Revisión Sistemática de la Literatura e integración de la información dentro de las tres fases del método científico de investigación para gestionar un estado del arte o estado del conocimiento.



Matrix, Review, Systematic

Matriz, Revisión, Sistemática

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Peer review under the responsibility of the Scientific Committee [<https://www.marvid.org/>]- in the contribution to the scientific, technological and innovation Peer Review Process through the training of Human Resources for the continuity in the Critical Analysis of International Research.



Introduction

In higher education institutions, in accordance with Article 2 of the General Law of Higher Education, published on April 20, 2021 ([General Law of Higher Education, 2021](#)), the facilities are established to carry out research work as part of their training process, which in some institutions is carried out during and at the end in the context of their comprehensive training and in accordance with a process to obtain the degree of studies, due to the above and considering that this process is carried out in several stages and proposing a form of organization, systematized at the time of carrying out the research work and that allows solving the research question by addressing the problems detected.

For the educational experience in higher education of research methodology, there are several authors who describe step by step how the scientific method composed in phases can be carried out, in this case Cesar A. Bernal was taken as a reference in this research process.

In the proposed scientific research method, 3 phases are considered; In the process of searching for information (heuristic phase), investigative actions are carried out on the literature based on empirical knowledge. The implementation of a methodology based on systematization allows us to avoid biases in the research, delimit the topic to be addressed, organize the search in an orderly manner and organize to manage previously established knowledge and answer the research question during the hermeneutic phase. Due to the above and once the exploration and interpretation of the applicable literature has been carried out, a tool based on a conceptual matrix is required for the integration phase that allows the author to document the themes (axes) of his or her research. and organize the information collected by integrating the most important data and present its report (state of the art or state of knowledge) within the research document. Based on what is established in the Systematic Review of Literature (RSL) of the topic, a proposal for organizing the literature in a visual screen based on a conceptual matrix (MC) is presented based on the application of the methodology (RSL) and integration of information within the phases of the scientific research method to manage a state of the art or state of knowledge, which allows the researcher (in this case higher education students) to prepare their reception experience report, dissertation or thesis as part of the construction of their educational experience to obtain the academic degree.

This document is made up of five sections: 1 Context, 2 State of the art, where the methodology of the Systematic Review of Literature (RSL) will be addressed to organize the information in a conceptual matrix (CM) and the authors cited in research methodology subjects; 3 The RSL methodology to prepare this document is described; In 4, the methodology used is developed step by step, and in 5, the result of the RSL is presented through the proposal of a tool to integrate the literature review and facilitate its integration for management and construction. of advances to present the state of knowledge or state of the art in research.

Context

In the subject of Research Methodology taught in higher education, most of them take Roberto Hernández Sampieri as a reference, however; Who also makes a great contribution to the scientific research method is Cesar A. Bernal who shares important material so that step by step the result of the search for information can be reached and both can contribute to the construction of the state of the art or state of knowledge, however; How can this section of the research be managed in an orderly and graphic way to have an overview of previously documented knowledge.

This is where the bases of this research are established to carry out an RSL based on the Scientific research method and the need to establish an instrument that allows collecting information from the literature review for the construction of the section of the research is identified. State of the art or State of knowledge (according to authors) to integrate the information and write in a practical way the report of the section of this stage of the research.

State of the art

According to the book “Guide for the preparation of your research project” by Dr. Gonzalo González Osorio, it addresses an example of digital competencies in new undergraduate students. a university regional for teachers, takes into account the methodology based on the RSL and in which it proposes the use of graphic instruments for the organization of documented information, within the research method it takes Cesar A. Bernal as a reference. ([González, 2022](#)). According to Cesar A. Bernal in his book “Research Methodology” he proposes a dispersed methodology to contribute to the purpose of training people with aptitudes and skills for scientific research. ([Bernal, 2010](#))

In accordance with the General Law of Higher Education published in the Official Gazette of the Federation Published on April 20, 2021, the regulatory framework is established in its article 2 to comply with the obligation of the state and contribute to social, cultural, scientific development. , technological, humanistic, productive and economic of the country through people in the field of research, as well as in article 7 in the comprehensive development of students in relation to the above. ([General Law of Higher Education, 2021](#)). Based on the text “Hermeneutics and heuristics as scientific methods in medical education” by Sani, Oropeza, Marañón, Puentes and Puentes, theoretical and practical aspects related to hermeneutics and heuristics as scientific methods for their contribution in education are analyzed. professional through a training and research process that enriches the theoretical-practical and scientific-cultural heritage with a totalizing approach to the human being. ([Sani, Oropeza, Marañón, Puentes y Puentes, 2021](#))

In the article “Uses and purposes of ePortfolios” by Lourdes Guardiola, a guide to the decision process for the implementation of digital portfolios is mentioned through a conceptual matrix understood as the support for the development of a diagnostic and projective tool applying a qualitative research method called Integrative Literature Review subjected to expert validation. ([Guardiaa, 2015](#))

In the article “Methodological strategy to develop the state of the art as a product of educational research” by Carlos Enrique and George Reyes presents a proposal for prepare the state of the art based on an analysis of its conceptualization, presenting an ordering scheme that can help consolidate the state of the art categorized into five moments: 1. Seed, 2. Approach to the study objective, 3. Context and inventory, 4. Analytical, 5. Interpretative. (Henry, 2019). In the bulletin “Systematic literature review: Fundamental concepts” of the University of Seville Library, with the purpose of answering the research question, a systematic and explicit process is proposed to identify, select and critically evaluate relevant research; Initially it was developed for issues related to the healthcare environment, but today it is applied to different scientific areas. ([University of Seville Library, 2020](#))The “State of the art on the subject of graphic organizers in the representation of diagrams and diagrams” by Frank Edison Guerra Reyes & Miguel Edmundo Naranjo Toro shows a product of the usual search for compilation of documents of the different types of diagrams that are necessary to develop graphic organizer assets in which signs are used.

Learning to develop the use of images, color and concepts. ([Guerra & Naranjo 2016](#))

In the book “The state of the art and the theoretical framework in research: A basis for the development of degree work” by Angélica María Alzate Ibáñez & Desiderio López Niño, the aim is to provide young researchers with evidence from theory and practice. about how an accurate review of the literature leads to building a state of the art and a theoretical framework, these components being the first stage of a research for the development of a degree work; Likewise, it provides the tools for students to begin their research work. ([Alzate & López, 2018](#))

Methodology to be developed

Based on the “Guide for the preparation of your research project” by Dr. Gonzalo González Osorio ([González, 2022](#)), the RSL methodology was taken up for the collection of information in decision making according to the bulletin “Systematic Reviews of scientific literature: fundamental concepts” (University of Seville Library, 2020) shares 6 steps to carry out the systematic review:

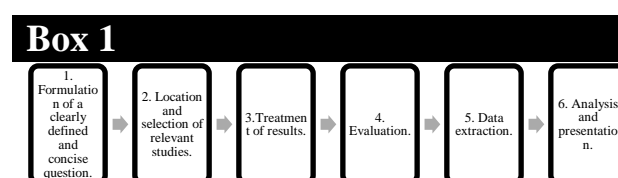


Figure 1

Systematic Review Methodology

Source: Own elaboration

Formulation of a clearly defined and concise question. The reasons why we need a response will be established. Most authors recommend following the components of a PICO question: population, intervention, comparison, out-come.

Location and selection of relevant studies. through a systematic search that identifies all relevant studies. In relation to sources, it is advisable to use at least one multidisciplinary bibliographic database, one specific to the area of study and an open search engine such as Google Scholar. In addition, detailed searches in related journals and manual searches of the so-called “gray literature” (bibliographic references, doctoral theses, communications to conferences, reports from public or private institutions, unpublished works or published in non-indexed journals, etc.) should be included.). The exhaustiveness and rigor of the literature search will largely determine the quality and final validity of the review.

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Treatment of results obtained from the search. Documents obtained from all search strategies should be exported to a reference manager (EndNote, Refworks, Mendeley) that allows the elimination of duplicate articles or articles found in several sources or with several search strategies.

Evaluation of the validity of the results of the included studies. Researchers must establish which of the recovered works will finally be included in the review, developing a list of inclusion and exclusion criteria that should be as objective as possible. To avoid the so-called selection bias, it is important to apply these criteria rigorously to each study, and it is recommended that this evaluation be carried out by several evaluators.

Extraction of data of interest, based on the type of study and the object of the research question. In each of the original articles that are reviewed, information of interest must be sought regarding the characteristics of the studies (design, inclusion/exclusion or selection criteria). cases and controls, selection period, follow-up period, randomization, type of intervention, etc.), to the characteristics of the study population, to its methodological quality (including the statistical analysis methods used) and to its results, with special emphasis on the description of the effect variables of interest. As in any other research project, it is advisable to prepare a form with the data that must be recorded for each work and that the data collection be carried out by more than one researcher, in order to evaluate the consistency of the results and agree on discrepancies.s.

Analysis and interpretation of the results, systematic presentation and synthesis of the characteristics and results of the included studies.

Development

For the first step, the question “Will there be a literature compilation instrument for the management of the state of the art or state of knowledge based on the Systematic Review, applicable to the scientific method?”, based on this approach, was carried out. The Systematic Literature Review was carried out using the Connected Papers, Scholar Google and Google tools. Likewise, the ResearchGate, Redalyc, and ScienceDirect databases were used to carry out the review of the literature related to the research topics (words keys).

In the second step, articles that were closely related to the information being sought were selected, giving priority to research no older than 5 years and that had a relationship with the proposed author (Cesar A. Bernal), that were oriented to the scientific method. (phases), which included conceptual matrices in their research, as well as a proposed research method for knowledge management. In the third step, the information was organized in the proposed tool (conceptual matrix), starting from the general to the particular; Likewise, the instrument (ANNEX) was designed based on elements that were found in the same research, which were helpful in the preparation of this research document.

En el cuarto paso se fueron respondiendo preguntas que ayudaron a elegir que literatura would be necessary to present in the report, which were applied in the following way: What was done and where? (objective and place), Why is the study important? (justification), How was it done? (method), What was found? (results), What was concluded? based on the macro description process proposed by Dr. Gonzalo González Osorio in his book “Guide to develop your research project” (González, 2022).

In the fifth step, the concentration of information was carried out in a collection instrument based on the Conceptual Matrix, which is divided into 3 parts (Identification of the literature, Description of its content and Reference). For the last step (step six), the information integrated into the proposed Conceptual Matrix was considered to carry out the analysis and interpretation of the literature; in which, the information resulting from the RSL applicable to this document was integrated in section two.

Results

This document can be identified from the regulatory review applicable to higher education to promote research in study plans and programs, to identifying a methodological proposal that can be integrated into the subject of research methods, likewise it is proposed from the complexity and recursivity how to approach the scientific research proposed by Cesar A. Bernal so that, through RSL, the collection of information, its integration and interpretation can be carried out in an orderly and systematic manner through a conceptual matrix that allows the result of the review to be presented in a sieve and integrate the State of the art or State of knowledge section of a research as part of the management of the information necessary for this stage of the research process of higher education students.

Conclusions

This document proposes the use of a tool applicable to higher education students in their research process to obtain a degree, which compiles the necessary sections that can be used to facilitate the process of integrating information in the management of the state of the art or knowledge in the research process; Likewise, this can be improved by having previous steps according to the scientific research method, which can be investigated in greater depth in subsequent works until integrating a general tool that can guide students step by step in the construction of their research instrument and allows its review, monitoring and construction from a systematic and recursive perspective.

Furthermore, this work will be used as a starting point and conceptual basis for the development of proposals that contribute to different training actions in research methods. The proposal presented here aims to become a projective tool aimed at improving current practices based on a conceptual matrix and the Systematic Review of Literature.

There may be improvements in future work to be carried out to apply with high school and higher education students in order to facilitate the teaching-learning process on the topic of Research Methods and take advantage of the use of information technologies..

Anexos

Box 2

Heuristics	Hermeneutics	Integration
<ul style="list-style-type: none"> • Qualification • Author • Year • Magazine / Editorial • Database (Query) • Kind of investigation • Tool "Where the information was sought from" 	<ul style="list-style-type: none"> • Problem • What Was Done And Where? (Purpose and Place). • Why is the study important? (Justification). • How it was made? (Method). • How does it apply? (Technique(s)) • What Was Found? (Results). • What was concluded? (Conclusion) 	<ul style="list-style-type: none"> • URL (Digital) • Citation (APA 7)

Figure 2

Proposal of the Conceptual Matrix to present the state of the art of a research based on the Systematic Literature Review methodology.

Source: Own elaboration

Declarations

Conflict of interest statement

The authors declare no interest conflict. They have no known competing financial interests or personal relationships that could have appeared to influence the article reported in this article.

Author contribution

Mendoza Ruiz, Irving: Developed Title of the article, context, state of the art, methodology, development, results, conclusions, references.

Antonio-Vidaña, Paula: contributed to the introduction, the annex of figure 1.2, conclusions, translation of the document and requirements for its publication.

Cabrera-Ortega, Kristal: Participate in the development of the state of the art, development of the methodology, analysis of the results, references and translation.

Availability of data and materials

Guide for preparing your research project.

Research Methodology administration, economics, humanities and social sciences.

General Law of Higher Education.

Hermeneutics and heuristics as scientific methods in medical education.

Conceptual matrix on uses and purposes of eportfolios.

Methodological strategy to develop the state of the art as a product of educational research.

The systematic review of scientific literature and the need to visualize research results.

Systematic Reviews of the scientific literature: fundamental concepts

State of the art on the subject of graphic organizers in the representation of schemes and diagrams

The state of the art and the theoretical framework in research: a basis for the development of degree Works.

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Abbreviations

MC Conceptual Matrix

PICO Population

RSL Systematic Revision of Literature

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Antecedents

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