

# How to Conduct a Systematic Literature Review?

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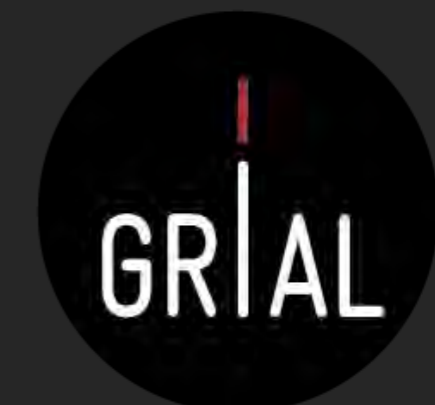
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POLITÉCNICA



Available at: <https://d66z.short.gy/A9BtIP>



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# Recommended article

- Developing robust state-of-the-art reports: Systematic Literature Reviews <https://doi.org/10.14201/eks.28600> [1]

i n t r o

1. Introduction to systematic reviews

# Types of Scientific Documents

Main formats used to communicate research, methods, data, and academic work



## 1. Research and technical publications



### Research article

Original and complete report of research findings



### Data paper

Describes a specific accessible dataset or group of datasets through metadata and academic publication standards



### Methodological article

Describes and evaluates research methods, techniques, or procedures



### Software Applications Article

Describes software tools or applications used in research, including features, functionality, and validation



### Letter

Reports an important and novel research result in a shorter format than a full article



## 2. Academic and argumentative works



### Essay

Argumentative text, usually by one author, presenting a viewpoint or position on a topic



### Academic projects

Bachelor's degree final projects, master's theses, and doctoral theses



### White Papers

In-depth reports that inform, analyze, or propose solutions to a specific problem or issue



## 3. Dissemination and communication



### Scientific dissemination article

Communicates scientific knowledge to a broad audience in an accessible and understandable way



### Post

Short digital publications shared on blogs, social media, or institutional platforms to disseminate scientific content



### Scientific presentations

Oral or poster presentations that present research findings at conferences, seminars, or academic events



## 4. Reviews and synthesis



### Systematic literature review article

Identifies, evaluates, and synthesizes all relevant studies on a specific research question using a systematic method



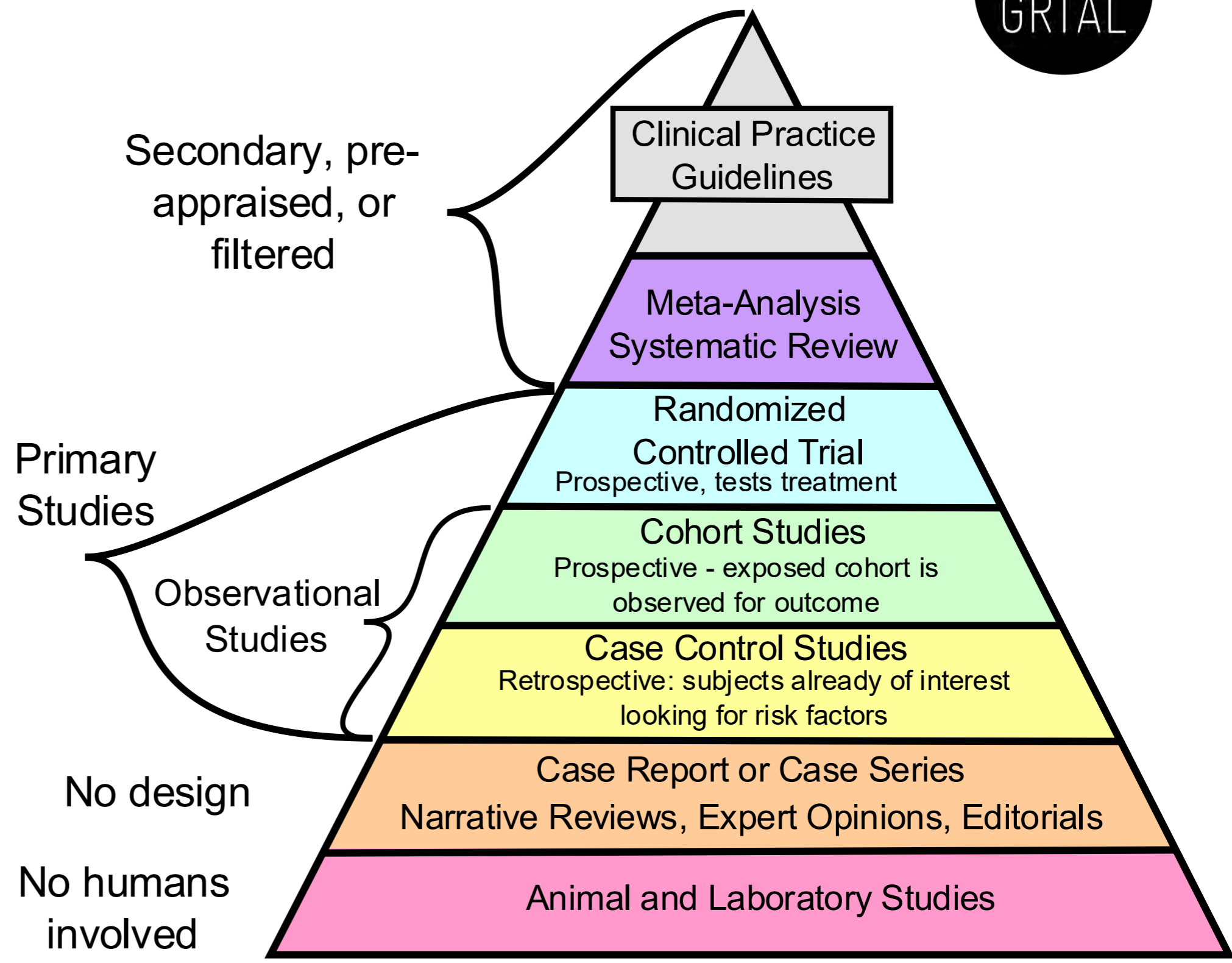
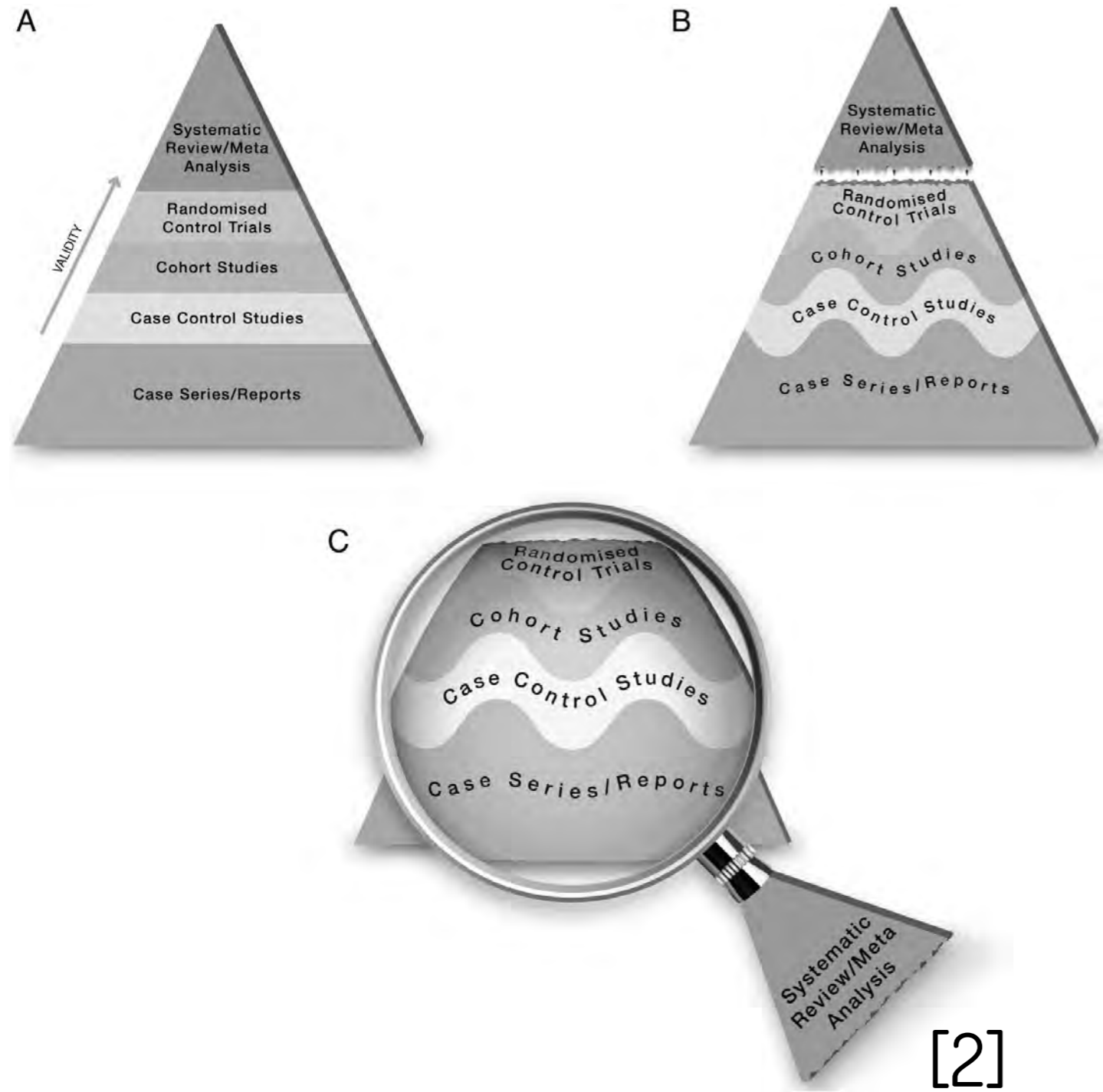
### Meta-analysis

Combines results from related studies to reach a broader conclusion



These document types play complementary roles in the creation, evaluation, dissemination, and application of scientific knowledge

# Types of studies



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# Literature reviews [3]

- Review papers are widely accepted in the academic field
- A literature review is a general description, with an analytical and/or critical approach, of the main works previously published in a field of knowledge
- The fundamental objective of a literature review is to try to identify what is known about the subject, what has been researched and what aspects remain unknown. That is, to provide an efficient synthesis of existing knowledge on the topic of interest
- Lately, the term systematic review is increasingly being used to refer to bibliographic reviews that must precede or justify a state of the art or in general any review study

# Systematic Literature Review (SLR)

- An SLR is a type of literature review that collects and critically analyzes multiple studies or research papers through a systematic process
- It is a systematic method for identifying, evaluating, and interpreting the work of researchers, scholars, and practitioners in a chosen field [4]
- The goal of an SLR is to provide a comprehensive summary of the available literature relevant to a research question

# Systematic Literature Review (SLR) [5]

- A systematic review is one in which there is an exhaustive search for relevant studies on a topic. Once the studies have been identified and obtained, the results are synthesized according to a pre-established and explicit method
- This form of revision gives the reader a great advantage over other revisions: the possibility of replicating it and verifying if the same conclusion is reached

# Systematic reviews as scientific research [6]

Systematic reviews **are** scientific investigations in themselves, with prefigured methods and an assembly of the original studies, which synthesize the results of these studies

# Review papers as review articles

- The review article is considered a detailed, selective, and critical study that integrates essential information in a unitary and overall perspective [7]
- The review can be recognized as a study in itself, in which the author has a question, collects data (in the form of previous articles), analyzes them, and draws a conclusion
- The fundamental difference between a review and an original work or primary study is the unit of analysis, not the scientific principles that apply [8]

# Characteristics of a systematic review [9]

- Systematic reviews begin by **defining a review protocol** that specifies the research question being addressed and the methods that will be used to conduct the review
- Systematic reviews are based on a **defined search strategy** that aims to detect as much relevant literature as possible
- Systematic reviews **document their search strategy** so that other researchers can assess its rigor, completeness, and potential repetition of the process (keeping in mind that searches in digital libraries are almost impossible to replicate)

# Characteristics of a systematic review [9]

- Systematic reviews **require explicit inclusion and exclusion criteria** to assess each primary study's potential
- Systematic reviews **specify the information they can obtain from each primary study**, including the quality criteria by which to evaluate each primary study
- A systematic review is a **prerequisite for a quantitative meta-analysis**

# Advantages of systematic reviews [9, 10]

- Its main advantage is the synthesis of information regarding a specific research question, which allows doubts to be resolved efficiently
- A well-defined methodology makes it less likely that the results of the literature are biased, although it does not protect against publication bias in primary studies
- They can provide information about the effects of a phenomenon through a wide range of empirical settings and methods
  - If studies yield consistent results, systematic reviews provide evidence that the phenomenon is robust and transferable
  - If studies give inconsistent results, sources of variation can be studied
- They avoid the risk of repeating research or using outdated theories
- In quantitative studies, data can be combined using meta-analysis techniques. This increases the likelihood of detecting real effects that individual smaller studies are unable to

# Limitations of systematic reviews [9, 10]

- They are retrospective studies and are therefore subject to bias in the various stages of the process: search, selection, analysis and synthesis of information
- The quality of this type of study is not guaranteed, so the reader must be able to critically evaluate its validity
- Systematic reviews are limited by the quantity and quality of studies previously conducted
- It requires a much greater effort than a traditional literature review, the process is long, it requires time and dedication

# Objectives for doing a review

- Achieve deeper knowledge in your field of knowledge
- Lay the foundations of a state-of-the-art academic project (master's degree, doctoral thesis, etc.)
- Gain insight into current trends and future challenges
- Identify the most important authors
- Identify the most important journals and conferences
- Have the foundation on which to make good publications

# Types of literature review

## Reviews

### Narrative or Traditional

They review a topic exhaustively, including various aspects. The topic is presented in a narrative format, without justifying the methods used to obtain or select the information. Suitable for answering preparation questions [11]

### Systematics

Summarize and analyze the evidence for a specific question in a structured, explicit, and systematic manner (applying rigorous, internationally recognized methods through well-defined protocols and frameworks. The method used to find, select, analyze, and synthesize primary sources (evidence synthesis) must be made explicit

# Differences between narrative and systematic reviews [12]



## Differences Between Narrative and Systematic Reviews



*Key characteristics of each review type*

Characteristic	Narrative Review	Systematic Review
<b>Research question</b>	Broad and not structured	Structured, clear, specific, and focused on a well defined clinical problem
<b>Literature search and source selection</b>	Not detailed, not systematic, and not aimed at locating all available studies High probability of bias	Detailed, systematic, and explicit
<b>Article selection</b>	No selection criteria Not reproducible High probability of bias	Selection based on explicit criteria Uniform application of inclusion and exclusion criteria to all articles
<b>Assessment of study quality</b>	No quality assessment	Critical appraisal and evaluation of the methodological quality of the studies
<b>Synthesis</b>	Often a subjective qualitative summary without a statistical estimator	Based on the methodological quality of the studies Often a quantified summary using a statistical estimator
<b>Interpretation</b>	Sometimes evidence based Frequently based on personal opinions	Generally evidence based

**Systematic reviews follow explicit and reproducible methods, while narrative reviews are broader and more interpretive**

# Types of literature review [13]

- **Critical review.** It aims to demonstrate that the literature has been thoroughly researched and its quality critically evaluated. It goes beyond mere description to include conceptual analysis and innovation. It usually gives rise to a hypothesis or a model. Examples: [14]
- **Literature review.** Generic term: published materials that provide an examination of recent or current literature. It can cover a wide range of topics with varying levels of comprehensiveness and breadth. Examples: [15-19]
- **Mapping review/ systematic map.** Traces and categorizes the existing literature from which to commission new reviews and/or primary research, identifying gaps in the research literature. Examples: [20-22]
- **Meta-analysis.** A technique that statistically combines the results of quantitative studies to provide a more accurate estimate of the results. Examples: [23-26]

# Types of literature review [13]

- **Mixed studies review/mixed methods review.** It refers to any combination of methods in which a significant component is a review of the literature (usually systematic). Within a review context, it refers to a combination of review approaches, for example, combining quantitative and qualitative research. Example: [27]
- **Overview.** Generic term. A summary of the literature that attempts to study it and describe its characteristics. Example: [28]
- **Qualitative systematic review/qualitative evidence synthesis.** Method for integrating or comparing the conclusions of qualitative studies. Look for "themes" or "constructs" within or across individual qualitative studies. Example: [29]
- **Rapid review.** Evaluation of what is already known about a policy or practical issue, using systematic review methods to search for and critically evaluate existing research. Example: [30, 31]
- **Scoping review.** Preliminary assessment of the size and potential scope of the available research literature. It aims to identify the nature and scope of research evidence (typically includes ongoing research). Example: [32, 33]

# Types of literature review [13]

- **State-of-the-art review.** They tend to address more current issues than other approaches combined. They can offer new perspectives on the topic or point to an area for further research. Example: [34]
- **Systematic review.** It systematically searches for, evaluates, and synthesizes research evidence, often following guidelines for conducting a review. They are a form of secondary study that uses a well-defined methodology to identify, analyze, and interpret all evidence related to a specific research question in an unbiased and (to some extent) repeatable manner [9]. Examples: [35-41]
- **Systematic search and review.** It combines the strengths of critical review with a thorough search process. It typically addresses broad questions to produce a "synthesis of the best evidence." Example: [42]
- **Systematized review.** It attempts to include elements of the systematic review process, but it is not a systematic review. Example: [43-44]
- **Umbrella review.** It specifically refers to the review that compiles evidence from multiple reviews into a single, accessible, usable document. It focuses on a broad condition or problem for which there are competing interventions and highlights reviews that address these interventions and their outcomes. Examples: [45-46]

# Types of literature review [10]

Reviews  
systematic

## Qualitative

The evidence is presented in a descriptive form without a statistical analysis

## Quantitative or meta-analysis

The results are quantitatively combined using statistical techniques

# Roadmap for choosing a type of review [47]

Purpose/ Destination	Type of Review	Time	Team Size Minimum	Tools Required	Search Reproducible?	Account for Bias?	Reporting Guideline	Example Articles
Provide a summary of the literature	Narrative	2-6 months <sup>23</sup>	1	Databases, reference management software optional	No	No	N/A	Epidemiology of heart disease: the influence of socioeconomic position. <sup>5</sup> Factors associated with increased health care utilization for patients with dementia with Lewy bodies: a narrative review. <sup>5</sup>
Answer a clinical question	Systematic	12-24 months or more <sup>23</sup>	2 <sup>7</sup>	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	PRISMA <sup>8</sup>	Hypothermia for neuroprotection in adults after cardiac arrest. <sup>13</sup>
Statistical combination of data from studies to determine effect	Meta- analysis	12 months or more	3 <sup>7</sup>	Databases, screening software, appraisal templates, extraction tools, reference management software, statistical analysis	Yes	Yes	PRISMA <sup>8</sup>	The Inflammatory Bowel Disease Questionnaire in randomized controlled trials of treatment for ulcerative colitis: systematic review and meta-analysis. <sup>14</sup>
Survey of what has been researched on a topic	Scoping	12 months or more	2	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	PRISMA- ScR <sup>24</sup>	Social determinants of health and health inequities in breast cancer screening: a scoping review. <sup>17</sup>
Answer a clinical question, often for rapid public health response	Rapid	1-6 months <sup>18</sup>	1 <sup>18</sup>	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	Not yet available	A rapid review of COVID-19's global impact on breast cancer screening participation rates and volumes from January to December 2020 <sup>19</sup>
Explore quantitative and qualitative studies to provide evidence for practice and in context of theoretical frameworks	Integrative	6-12 months <sup>23</sup>	2	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	PRISMA <sup>8</sup> suggested	Usefulness of nursing theory- guided practice: an integrative review. <sup>21</sup>
Explain the literature on an experience, event, or phenomena by gathering and appraising qualitative research studies	Evidence Synthesis	12-24 months	2	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	PRISMA <sup>8</sup> Suggested	Breast cancer genetic mutation: synthesis of women's experience. <sup>22</sup>

# Summary

1. Systematic review (meta-analysis and/or meta-synthesis)

Exhaustive search, in-depth information on a specific topic – make recommendations

2. a) Scoping review – b) Rapid review

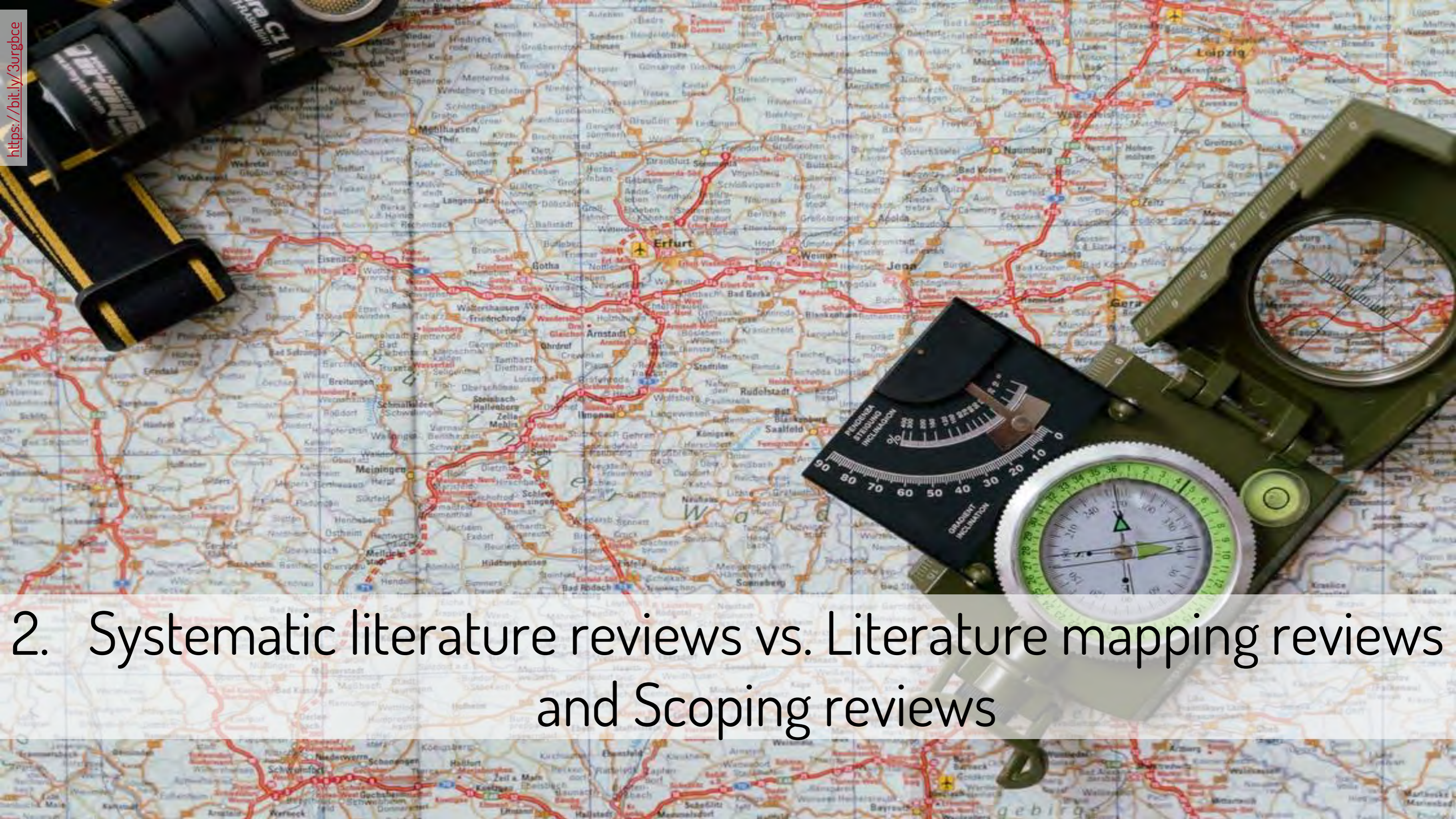
(a) Exploratory research; scope of evidence; Existing gaps  
 b) Rigorous synthesis in a rapid manner (time limitation)  
 a+b: Review process = systematic review

3. Literature Review or Narrative Review

Establish a theoretical framework studies, models, monographs, on a specific topic  
 It does not call for the development of a protocol

4. Umbrella review (Review Reviews)

Review of multiple systematic reviews



## 2. Systematic literature reviews vs. Literature mapping reviews and Scoping reviews

# Mapping review

- Transparent, rigorous, and systematic approach to identifying, describing, and cataloging evidence and gaps in a topic from an area with a broad perspective
- Collect, describe, and catalog the available evidence on the issue of interest [48]
- They try to answer questions like: "What do we know about a topic?" or "What and where has been researched on a topic?"
- It usually extracts only descriptive information about studies and applies predefined codes (high-level data). In this sense, there may be an "aggregative" logic (aggregating data to answer the review question) [49]

# Mapping review [13]

- The aim is to map and categorize the existing literature on a particular topic, identifying gaps in the literature from which further reviews and/or primary research can be commissioned
- Mappings differ from systematic literature reviews in that the subsequent outcome may involve additional review work or primary research, and this outcome is not known in advance

# Mapping review [13]

- They are a valuable tool to provide policymakers, practitioners, and researchers with an explicit and transparent means of identifying key aspects of mapping
- Mappings can characterize studies in different ways, for example, depending on the theoretical perspective, the population group, or the setting in which the studies were conducted
- They can also provide the basis for making an informed decision about whether to conduct an in-depth review and synthesis of all studies or only a subset

# Mapping review

- The techniques and results of literature mappings are very different depending on the purpose
  - Write words, phrases, and topics related to the main topic in a white paper to collect key concepts and themes
  - Summarize key findings from journals, books, and working papers to create concept maps
  - Present a summary of journals, conferences, years of publication, most important authors, etc.
  - Etc.

# Systematic literature reviews vs. Literature mapping reviews



Mapping Review

≠

Systematic Literature Review

# Systematic literature reviews vs. Literature mapping reviews



- While mappings make sense independently, as a means of discovering the potential of a field of research or its state at a given time, they can also be used to complement an SLR
- Mapping reviews allow systematic literature reviews to be contextualized within a larger literature and to identify gaps in the evidence base [13]
- Mapping techniques are useful at the beginning of a systematic literature review as a brainstorming and contextualization tool

# Systematic literature reviews vs. Literature mapping reviews



Literature Mapping Review

+

Systematic Literature Review

=

**Better Results**

# Weaknesses of mapping reviews [13]

- They are limited in time and lack the synthesis and analysis of SLRs
- Studies may be characterized at a broad descriptive level and thus oversimplify the picture or mask considerable variation (heterogeneity) between studies and their results, depending on the degree of specificity of the coding process
- They do not usually include a quality assessment process, characterizing studies solely according to the study design

# Scoping review

- This type of review has been defined and described in the literature in many ways
- To avoid confusion, this definition of scoping review has been proposed
  - It is a type of evidence synthesis that systematically identifies and maps the breadth of available evidence on a particular topic, field, concept, or issue, often regardless of source (e.g., primary research, reviews, non-empirical evidence) and within or across particular contexts
  - Scoping reviews can clarify key concepts or definitions in the literature and identify key characteristics or factors related to a concept, including those related to research methodology [50]

# Scoping review [51]

- It is a type of systematic review applied to describe the situation of a field of knowledge. Therefore, it is a kind of synthesis of evidence
- They are characterized by the fact that they are based on broad research questions [52], in forms such as the following
  - What are the main characteristics of research in the field of knowledge X?
  - What methodologies are used in field X?
  - What characteristics and research opportunities are present in field X?
  - ...
- They are suitable for
  - Doctoral theses
  - Research project reports
  - As a first research at the beginning of a medium/long-term project
  - Identify research priorities

# Scoping review [51]

- Analysis
  - Two types of analysis schemas are typically used
    - Data tables
      - General Reference List
      - List(s) of specific characteristics (countries, sources, methods, etc.)
    - Abstracts
      - Narrative: about 300 words per selected document
      - Structured in the same sections
        - Objectives
        - Main results
        - Implications
        - Topics
        - etc.

# Scoping review [51]

- Synthesis
  - Mission
    - To provide a descriptive synthesis and, if possible, configurative or interpretative, that provides more than the mere sum of the parts
    - The ideal synthesis should provide the keys to interpreting the main aspects of an area of knowledge in terms of dominant paradigms, mainstreams, and theories, as well as detecting trends and guiding new research
  - Techniques
    - Tables to synthesize data in a way that provides meaningful results
    - Narrative summaries that present a global narrative synthesis, avoiding as far as possible mere descriptions to provide a critical synthesis, whether interpretative or configurative

# Scoping review [51]

- Synthesis
  - Data extraction tables are themselves a form of synthesis that can be extended with intersections between them
  - Abstracts can provide a narrative synthesis organized around
    - Topics: inductively or deductively determined
    - Chronological evolution: how a concept has evolved
    - Methodologies: main methodologies used and their results
  - Comparison of lines of research
    - Opposing Research: Lines of Results Showing Contradictions
    - Research that supports a line of development: the union of different research results that support the same theoretical line
    - Different research that actually points to the same results with different terminologies

# Scoping review to identify research priorities [53]

- Areas where scoping reviews can be used to identify research priorities
  1. Delimitation of an area of investigation and identification of gaps
  2. Topic prioritization
  3. Identification of study designs, quality, and outcome measures
  4. Identification of contextual factors relevant to the field of research
  5. Identifying equity issues
  6. Collaboration with stakeholders, including subject matter experts
  7. Seeking funding

# Limitations of scoping reviews [54]

- First, a systematic review usually focuses on a well-defined issue where appropriate study designs can be identified in advance, whereas a scoping study tends to address broader topics where many different study designs can be applied
- Second, the systematic review aims to answer questions from a range of studies of assessed quality, whereas a scoping study is less likely to have very specific research questions and, consequently, an assessment of the quality of the studies in the included studies

# Mapping reviews and Scoping reviews are not the same type of systematic reviews [49]



- Although these terms are sometimes used interchangeably or complementarily (some definitions tend to use terms that suggest mapping is a specific approach or vice versa), they are actually used to describe different types of syntheses and are therefore different types of systematic reviews [13, 55]
- Scoping reviews can be more exploratory than mappings, as they do not require a set of a priori codes to describe the data and can draw on various sources of information (primary research, reviews, non-empirical evidence, etc.) in or across specific contexts. The approach can be more iterative, inductive (an unknown theory or framework that needs to be developed), or deductive (a pre-existing theory or framework that needs to be tested) [54]
- Instead, mappings address broader issues, use predefined coding, and adopt a shallower data mining strategy [49]

# Similarities and differences between Mapping reviews and Scoping reviews [49]



- Address broad (big-picture) research questions
- They are systematic and transparent methodological proposals for locating, extracting, and analyzing data
- They are based on the development of a predefined protocol
- They are supported by a methodological guide
- They can include a variety of different types of evidence or focus on only one type of evidence
- Tendency more towards description than synthesis or grouping of evidence
- Include descriptive and numerical summaries

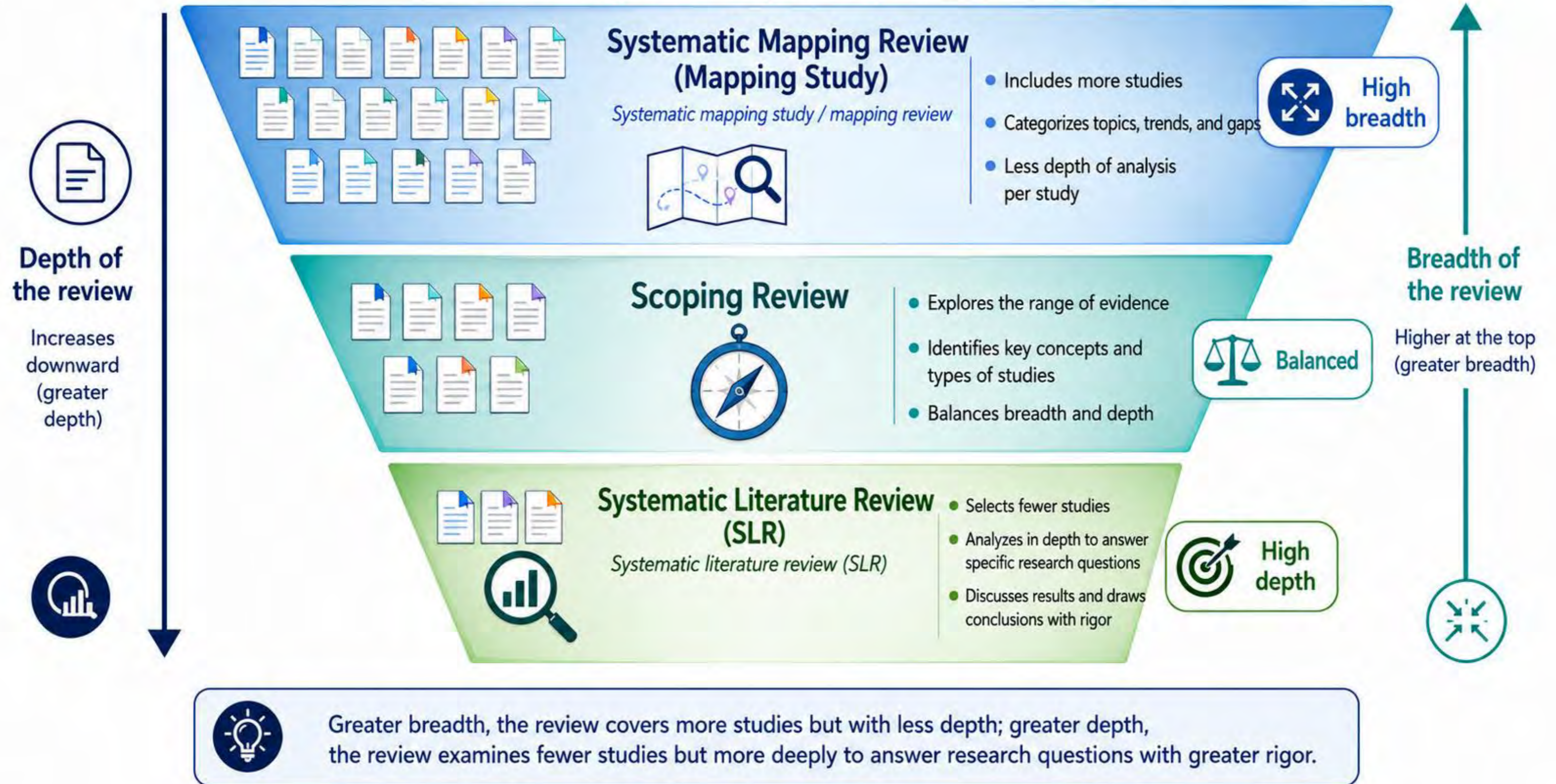


- Inductive or deductive approach
- More detailed data extraction
- Narrower focus on a broad issue
- Less than 40-80 studies
- It can include iterative processes in the search, extraction and analysis of the data
- May include qualitative analysis

- Deductive approach
- Higher-level data extraction with predefined coding categories
- Predefined coding framework
- Broader approach to a broad issue
- Generally, more than 80 studies
- Extensive use of visuals to represent results

# Breadth vs. Depth in Types of Literature Reviews

A funnel metaphor to compare scope and level of analysis



### 3. Methodological frameworks of reference for systematic literature reviews

# Characteristics of a systematic review [3]

- **Systematic** means that it is not arbitrary: neither biased nor subjective, but, on the contrary, the best available scientific production has been examined using the best sources of information
- **Complete** means that information systems have been used that are presumed to facilitate access to the bulk of the quality production of a discipline at an international level; and that nothing has been discarded or included without following criteria other than those that have been made explicit
- **Explicit** implies that both the sources used and the criteria for search and selection and exclusion are disclosed
- **Reproducible** by being systematic and explicit. Other researchers are allowed to check the work and, if they wish, to follow the steps and compare the results obtained to determine their accuracy or degree of success

# Methodological frameworks for conducting systematic reviews



- Main methodological frameworks of reference to determine the search protocols to be followed in the different types of systematic reviews
  - Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [56-57]
  - Search, Appraisal, Synthesis, and Analysis (SALSA) [13]
- Other Frameworks
  - Protocol and Reporting result with Search, Appraisal, Synthesis, and Analysis framework, and develop (PSALSAR) [58]
  - ReSiste-CHS (Revisiones Sistematizadas en Ciencias Humanas y Sociales) [59]

# PRISMA (<http://www.prisma-statement.org/>)

- The goal of the PRISMA framework is to help authors improve information from systematic reviews and meta-analyses
- PRISMA may also be useful for the critical evaluation of published systematic reviews
- The PRISMA statement consists of a checklist of 27 items and a flowchart with the phases of the review
- The checklist included in PRISMA is not a quality assessment tool for a systematic review
- Two revisions: Latest PRISMA 2020 version [56-57]

# Lista de comprobación de PRISMA 2020 [56-57]



PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	

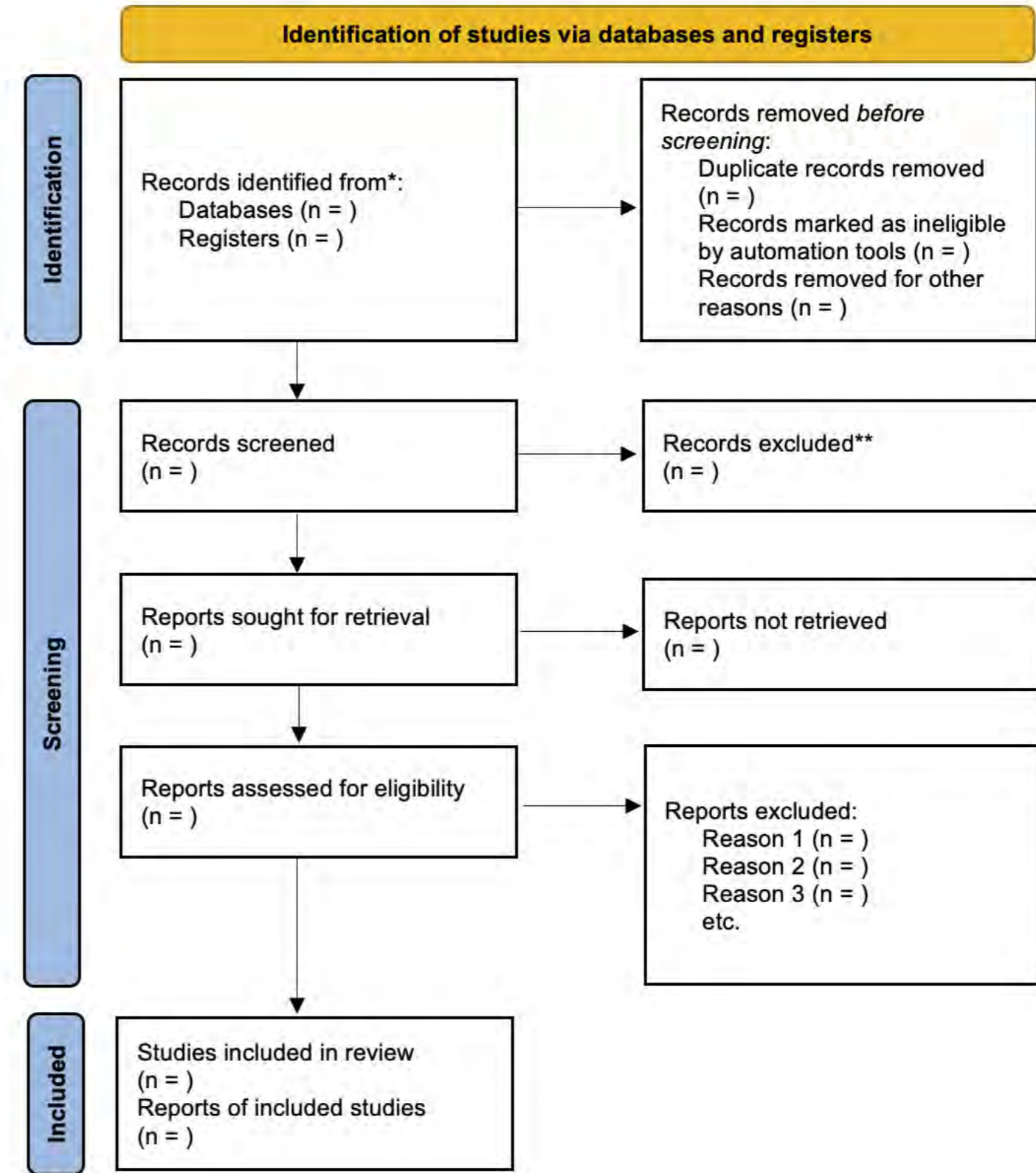
PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	
Study characteristics	17	Cite each included study and present its characteristics.	
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	Discuss any limitations of the evidence included in the review.	
	23c	Discuss any limitations of the review processes used.	
	23d	Discuss implications of the results for practice, policy, and future research.	
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

# PRISMA 2020 Flowchart [56, 57]

<https://www.prisma-statement.org/prisma-2020-flow-diagram>



\*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

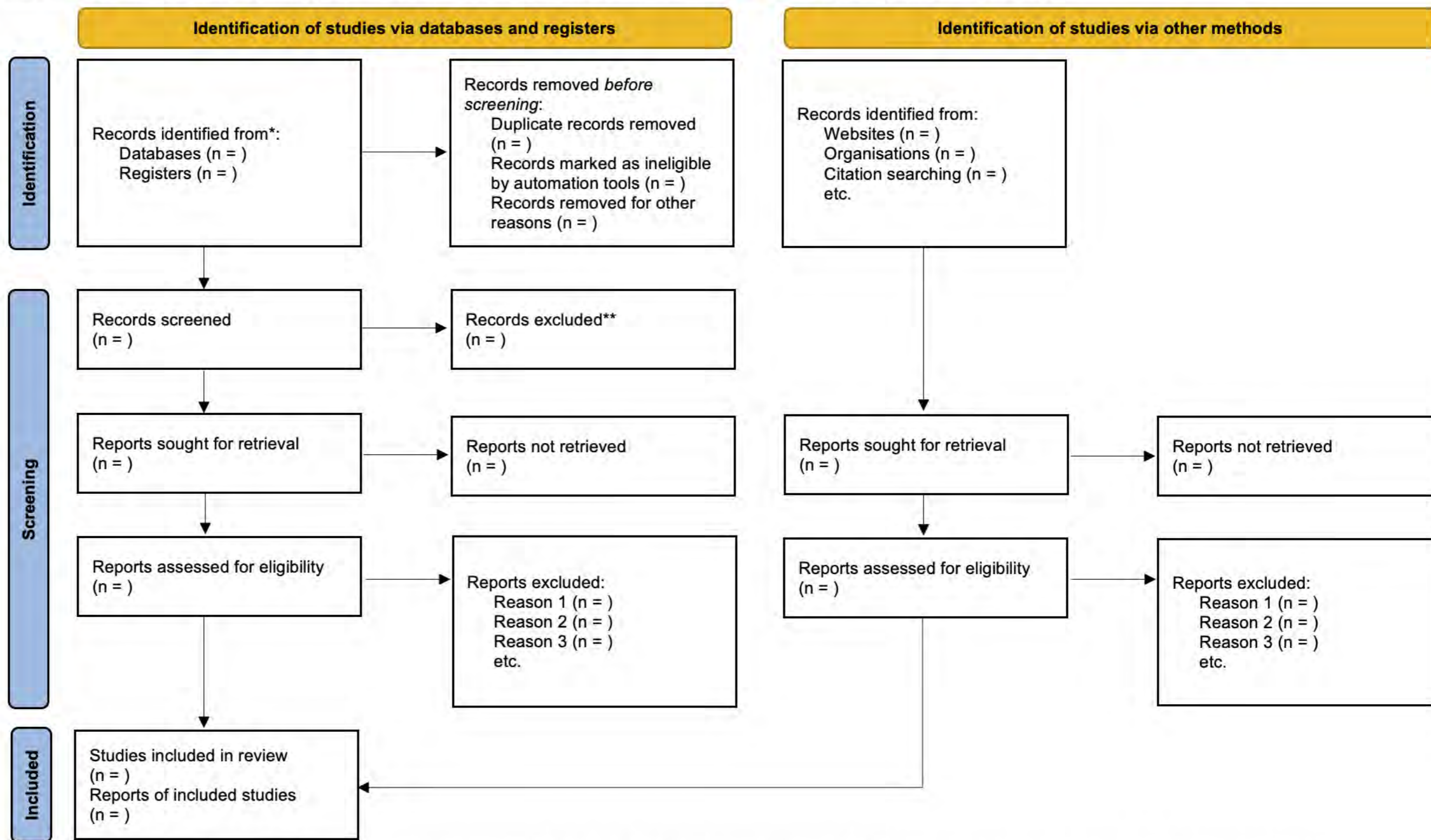
\*\*If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.



# PRISMA 2020 Flowchart [56, 57]

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources

<https://www.prisma-statement.org/prisma-2020-flow-diagram>

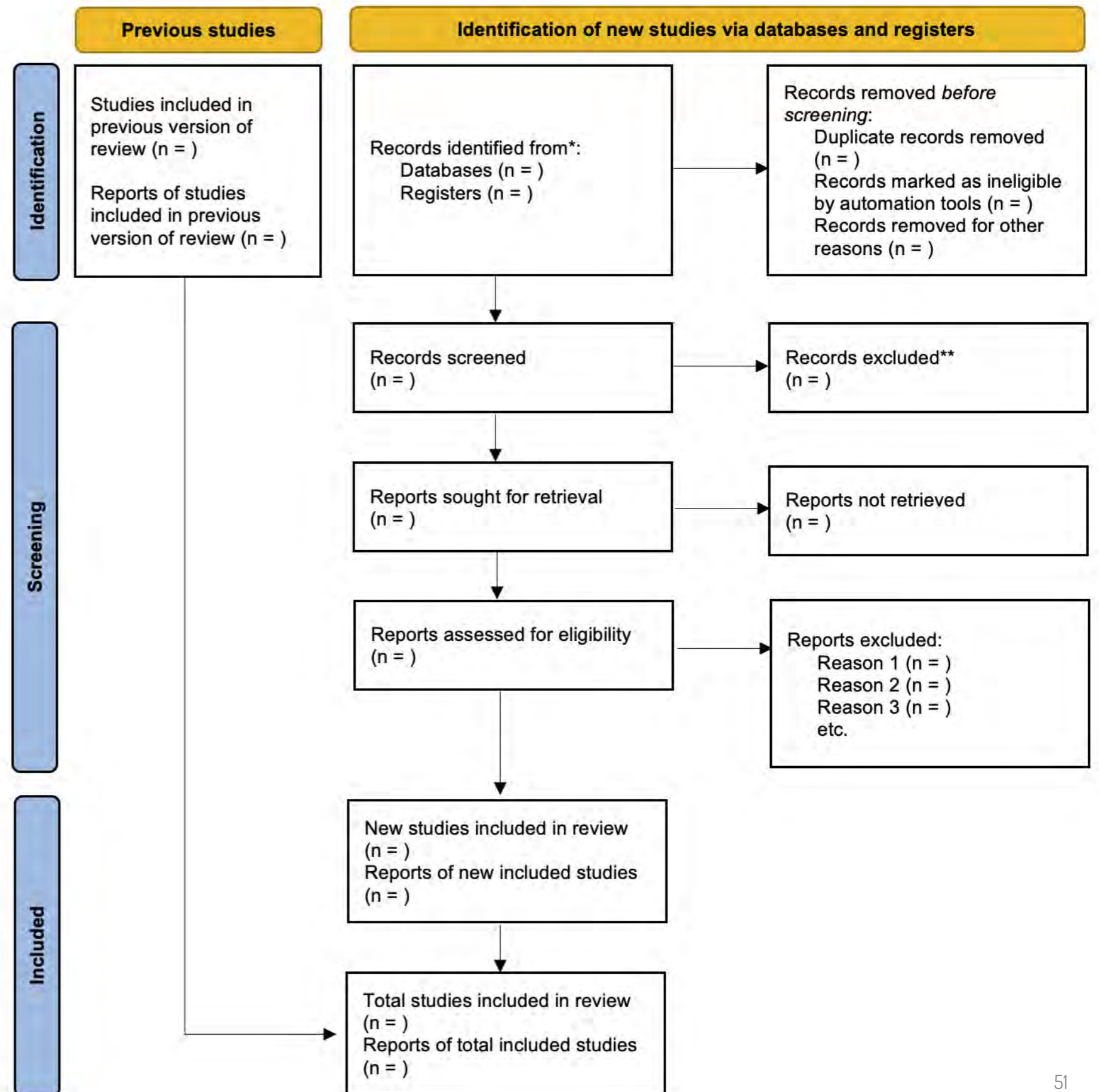


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\*\*If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

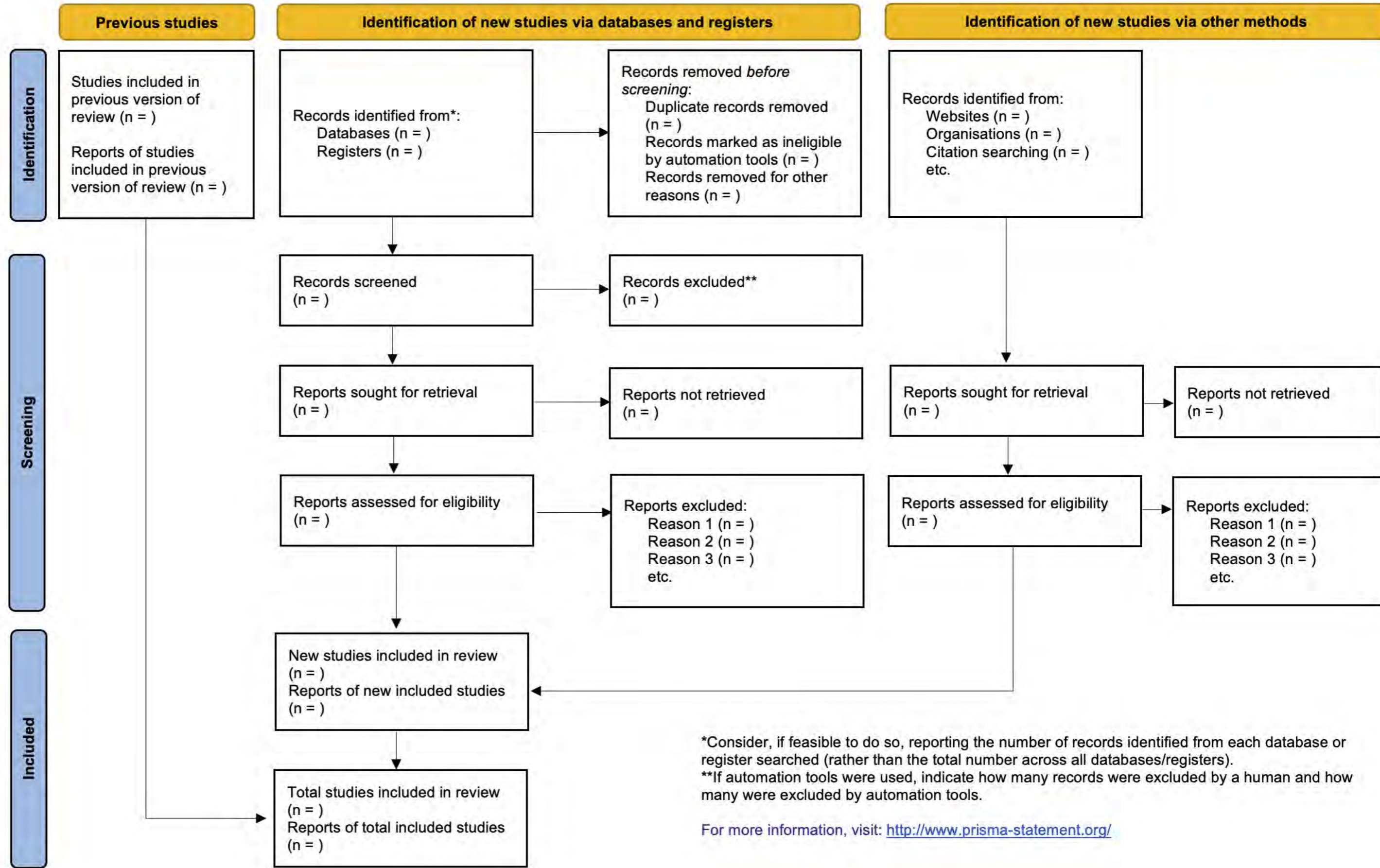
# PRISMA 2020 Flowchart [56, 57]

<https://www.prisma-statement.org/prisma-2020-flow-diagram>



# PRISMA 2020 Flowchart [56, 57]

<https://www.prisma-statement.org/prisma-2020-flow-diagram>

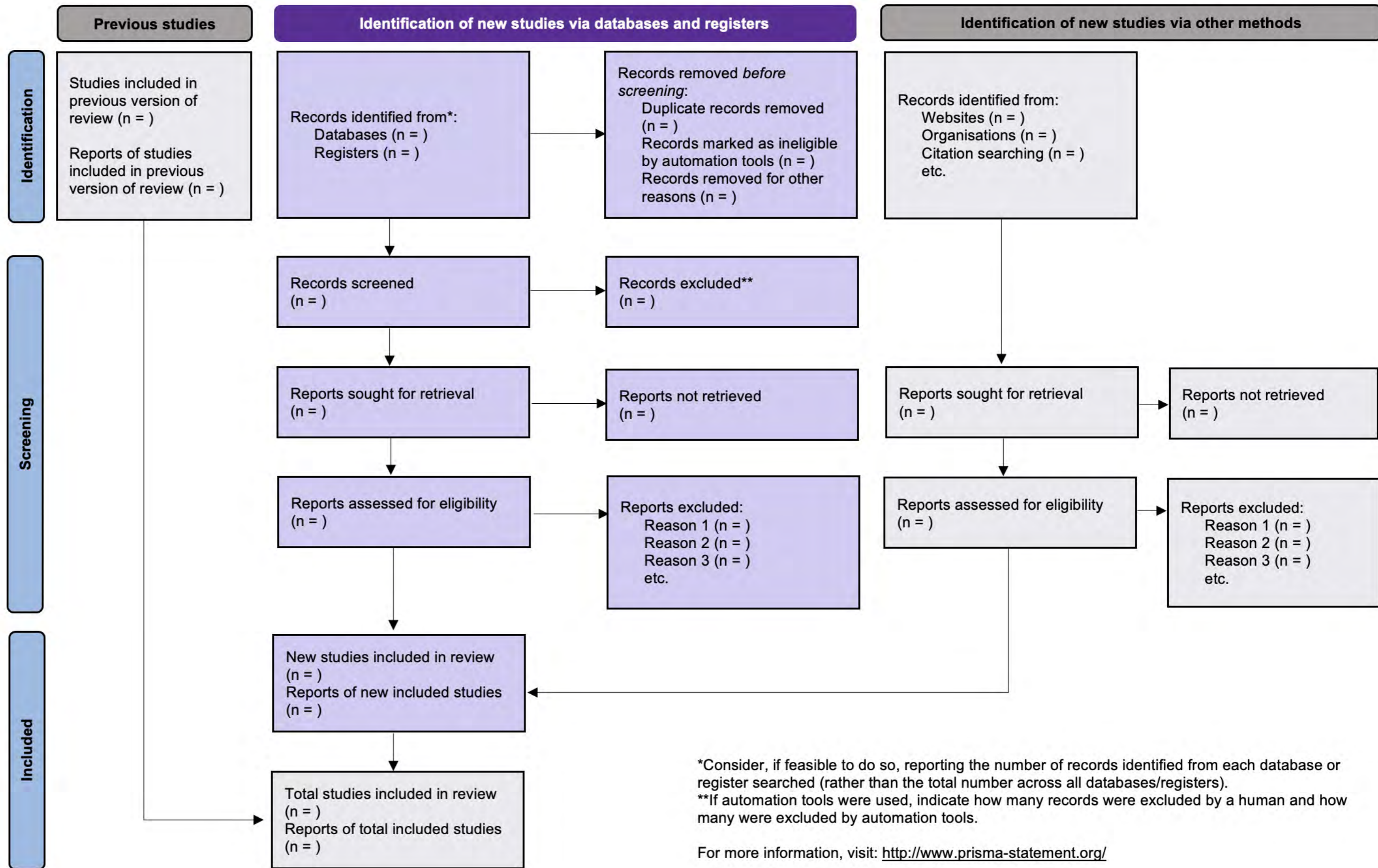


\*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/register).  
 \*\*If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

For more information, visit: <http://www.prisma-statement.org/>

# PRISMA 2020 Flowchart [56, 57]

<https://www.prisma-statement.org/prisma-2020-flow-diagram>



# PRISMA 2020 Flowchart [56, 57]

- There is a tool, Shiny App, to make the flowcharts according to the 2020 update

<https://www.eshackathon.org/software/PRISMA2020.html>

# PRISMA-Scoping Reviews [60]

<https://www.prisma-statement.org/scoping>

- The PRISMA extension for scoping reviews (PRISMA-ScR) was published in 2018
- The checklist contains 20 essential reporting items and 2 optional items to include when completing a scoping review
- Scoping reviews synthesize evidence and assess the scope of the literature on a topic
- Among other objectives, scoping reviews help determine whether a systematic review of the literature is warranted

# PRISMA-ScR Checklist [60]

<https://d66z.short.gy/CbzbRe>

## Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
<b>DISCUSSION</b>			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

\* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: 10.7326/M18-0850.

# SALSA [13]

- It allows us to analyze whether an analysis methodology guarantees the four characteristics (systematic, complete, explicit and reproducible)

Search  
Appraisal  
Synthesis  
Analysis

# SALSA [13]

- **Search**

- It refers to how the search for the works that will be subject to review is carried out
- The review protocol should state that the search is performed using reference databases, such as WoS or Scopus, for example
- It also refers to the fact that the search must be carried out with transparent and well-defined criteria, both for inclusion and exclusion of the works to be analyzed. Typically, these criteria will be expressed with the choice of keywords, the corresponding search equations, and possibly by applying filters of some kind. For example, documents published in the last 5 or 10 years, or in certain languages, etc.
- The final objective of this phase is to obtain a bank of articles made up of a variable number that can range from a few tens to a hundred, depending on the type of study, the objectives and the selection and exclusion criteria applied

# SALSA [13]

- **Appraisal**

- This phase refers to the evaluation of the works obtained through the various searches, with what criteria the contributions of each of the components of the initial article bank will be considered to decide if they will finally be part of the review
- Criteria that establish a double filter are usually used: pragmatic criteria, such as the date of publication of the works, geographical or thematic scopes, etc.; and criteria for the quality of the work, such as the quality of the research, the methodologies used, the results, etc.
- In this phase, it will therefore serve to exclude the works from the final corpus and ensure that those that are part of the review are of sufficient quality and relevance

# SALSA [13]

- **Synthesis and Analysis**
  - These two phases refer to those that will allow the results of each of the components of the article bank to be gathered and compared
  - In the case of quantitative research, it will be done using statistical techniques
  - In the case of qualitative research, it can be presented in various forms, including review or critical narration, and the state of the art
  - Synthesis refers to the synthetic representation of each work based on the extraction of the characteristics of each article considered. In quantitative research, numerical-statistical aspects will be addressed using meta-synthesis techniques. In the case of qualitative research, tables or cards can be used to synthesize the common dimensions with which the different articles or selected works have been studied
  - Analysis refers to the description and global assessment of the results found. In the case of the states of the question, it allows us to present a global discourse about the field of study under consideration through the analysis of the results

# Types of revision characterized using the SALSA framework [13]

3w types characterized by methods used

Methods used (SALSA)				
Description	Search	Appraisal	Synthesis	Analysis
Aims to demonstrate writer has extensively researched literature and critically evaluated its quality. Goes beyond mere description to include degree of analysis and conceptual innovation. Typically results in hypothesis or model	Seeks to identify most significant items in the field	No formal quality assessment. Attempts to evaluate according to contribution	Typically narrative, perhaps conceptual or chronological	Significant component: seeks to identify conceptual contribution to embody existing or derive new theory
Generic term: published materials that provide examination of recent or current literature. Can cover wide range of subjects at various levels of completeness and comprehensiveness. May include research findings	May or may not include comprehensive searching	May or may not include quality assessment	Typically narrative	Analysis may be chronological, conceptual, thematic, etc.
Map out and categorize existing literature from which to commission further reviews and/or primary research by identifying gaps in research literature	Completeness of searching determined by time/scope constraints	No formal quality assessment	May be graphical and tabular	Characterizes quantity and quality of literature, perhaps by study design and other key features. May identify need for primary or secondary research
Technique that statistically combines the results of quantitative studies to provide a more precise effect of the results	Aims for exhaustive, comprehensive searching. May use funnel plot to assess completeness	Quality assessment may determine inclusion/exclusion and/or sensitivity analyses	Graphical and tabular with narrative commentary	Numerical analysis of measures of effect assuming absence of heterogeneity
Refers to any combination of methods where one significant component is a literature review (usually systematic). Within a review context it refers to a combination of review approaches for example combining quantitative with qualitative research or outcome with process studies	Requires either very sensitive search to retrieve all studies or separately conceived quantitative and qualitative strategies	Requires either a generic appraisal instrument or processes with corresponding checklists	Typically both components will be presented as narrative and in tables. May also employ graphical means of integrating quantitative and qualitative studies	Analysis may characterize both literatures and look for correlations between
Generic term: summary of the (medical) literature that attempts to survey the literature and describe its characteristics	May or may not include comprehensive searching (depends whether systematic overview or not)	May or may not include quality assessment (depends whether systematic overview or not)	Synthesis depends on whether systematic or not. Typically narrative but may include tabular features	Analysis may be chronological, conceptual, thematic, etc.
Method for integrating or comparing the findings from qualitative studies. It looks for 'themes' or 'constructs' that lie in or across individual qualitative studies	May employ selective or purposive sampling	Quality assessment typically used to mediate messages not for inclusion/exclusion	Qualitative, narrative synthesis	Thematic analysis, may include conceptual models

# Types of revision characterized using the SALSA framework [13]

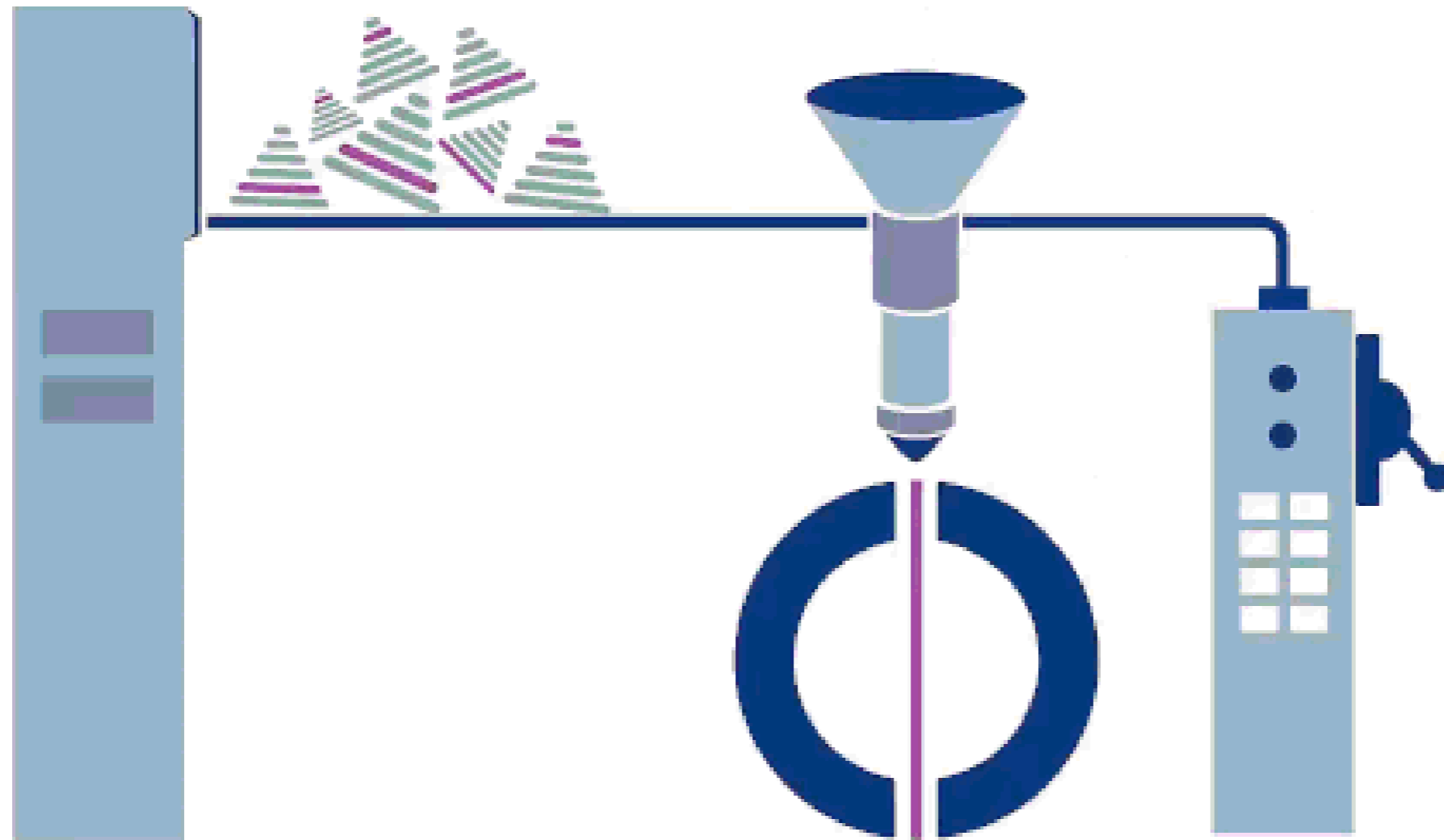
1 Continued

		Methods used (SALSA)			
	Description	Search	Appraisal	Synthesis	Analysis
Review	Assessment of what is already known about a policy or practice issue, by using systematic review methods to search and critically appraise existing research	Completeness of searching determined by time constraints	Time-limited formal quality assessment	Typically narrative and tabular	Quantities of overall quality, effect of literature
Pre-review	Preliminary assessment of potential size and scope of available research literature. Aims to identify nature and extent of research evidence (usually including ongoing research)	Completeness of searching determined by time/scope constraints. May include research in progress	No formal quality assessment	Typically tabular with some narrative commentary	Characterizes literature, provides design and other attempts to specify current state of investigation and priorities for future research
Review-of-the-art	Tend to address more current matters in contrast to other combined retrospective and current approaches. May offer new perspectives on issue or point out area for further research	Aims for comprehensive searching of current literature	No formal quality assessment	Typically narrative, may have tabular accompaniment	Current state of investigation and priorities for future research
Systematic review	Seeks to systematically search for, appraise and synthesis research evidence, often adhering to guidelines on the conduct of a review	Aims for exhaustive, comprehensive searching	Quality assessment may determine inclusion/exclusion	Typically narrative with tabular accompaniment	What is known for practice. What is unknown, uncertainties, findings, recommendations for future research
Critical review	Combines strengths of critical review with a comprehensive search process. Typically addresses broad questions to produce 'best evidence synthesis'	Aims for exhaustive, comprehensive searching	May or may not include quality assessment	Minimal narrative, tabular summary of studies	What is known, recommendations, limitations
Systematized review	Attempt to include elements of systematic review process while stopping short of systematic review. Typically conducted as postgraduate student assignment	May or may not include comprehensive searching	May or may not include quality assessment	Typically narrative with tabular accompaniment	What is known around findings methodology
Meta-review	Specifically refers to review compiling evidence from multiple reviews into one accessible and usable document. Focuses on broad condition or problem for which there are competing interventions and highlights reviews that address these interventions and their results	Identification of component reviews, but no search for primary studies	Quality assessment of studies within component reviews and/or of reviews themselves	Graphical and tabular with narrative commentary	What is known, recommendations, What remains, recommendations, future research

# Phases of a systematic review [9, 61]

- Plan the systematic review
  - Identify the need for the review
  - Formulating research questions
  - Define the review protocol
  - Validate the review protocol
- Conducting the systematic review
  - Identify relevant research
  - Select primary studies
  - Assessing the quality of primary studies
  - Extract the relevant data
- Report the systematic review
  - Synthesize the extracted data
  - Write the review report
  - Validate the review report

# Phases of a systematic review

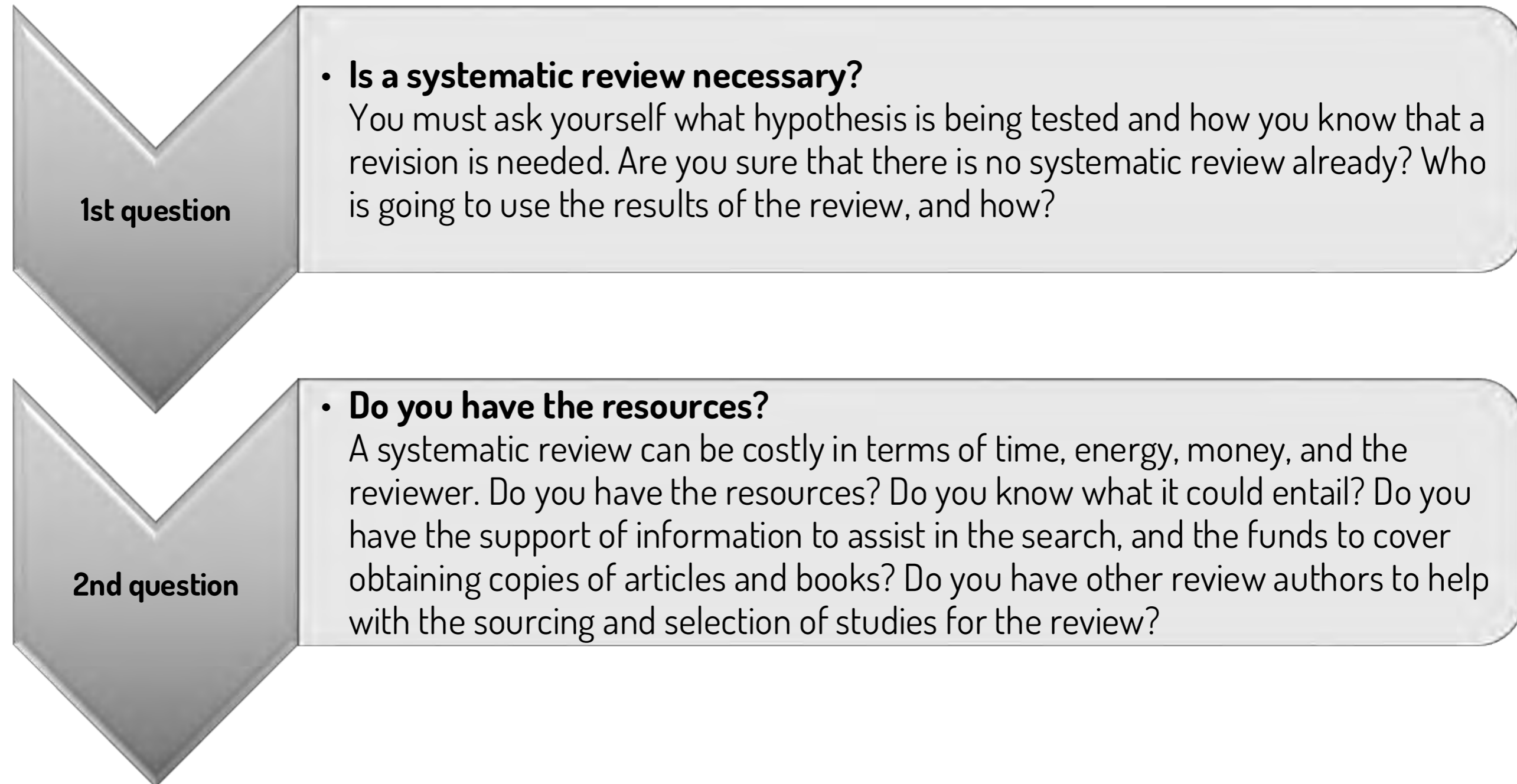


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<https://commons.wikimedia.org/w/index.php?curid=49168037>



## 4. Planning phase

# Identify the need for the review – Issues prior to carrying out a systemic review



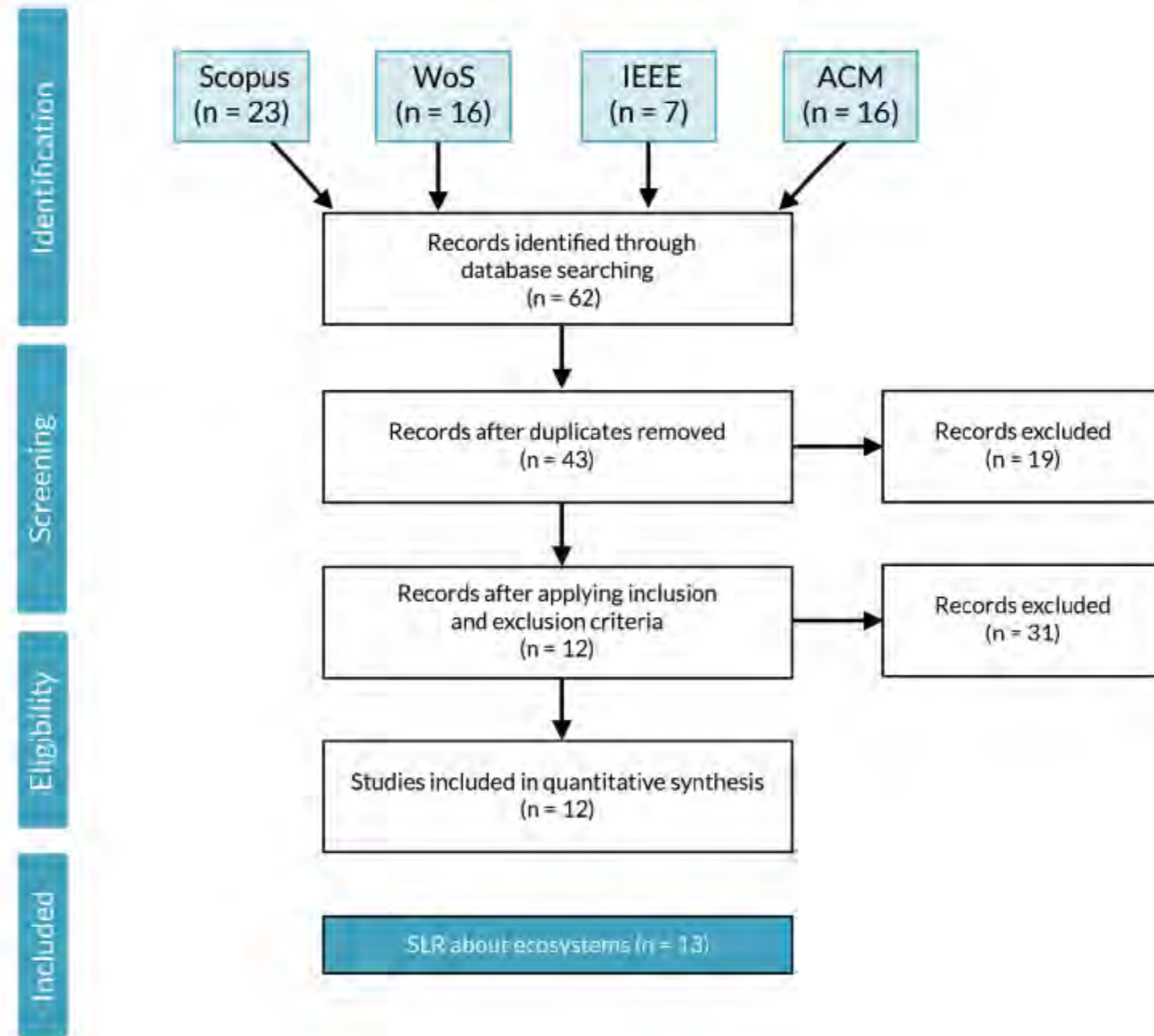
# Is the systematic review continuing?

- It makes no sense to do a systematic review that has already been done before, unless [62, 63]
  - It is clear that previous systematic reviews are biased
  - Are significantly outdated, for example, if new studies have been published since the existing review was completed
- **It is important to start any new review by searching for existing systematic reviews**
- **If several review papers are found, the time and effort necessary to analyze whether or not the contributions of these reviews require a new systematic review process [46]**

# Studying existing systematic reviews [46]

- MQ1. How many studies were published over the years?
- MQ2. Who are the most active authors in the area?
- MQ3. What type of papers are published?
- MQ4. In which sources appear this kind of studies?
- MQ5. Which are the most common databases used in this kind of studies?
- MQ6. Which search terms are used to define the search string in this kind of studies?
- MQ7. In which domains are the studies focused?
- MQ8. Which years cover the review and mapping studies?
- MQ9. What type of review are published?

# Studying existing systematic reviews [46]



Other aspects to consider when deciding to proceed with the systematic review and what type of review to do

- What is the scope of the systematic review? [64]
- How much time can be invested?
- What benefits are expected?
- Where do I want to publish the review?

# Formulating the research questions

- The purpose of a systematic review is to identify knowledge gaps and research needs in a particular field or area
- This requires a clear specification of the problem area and a critical review of the literature within that domain, to present an appropriate line of argument that identifies knowledge gaps and research needs that need to be addressed

# Research Questions

- At the beginning of the review, it is necessary to clearly specify the questions that the review aims to answer
- Although systematic reviews often aim to answer individual questions or test a single hypothesis, sometimes strategic issues make the field of questions much wider, and it may be necessary to work to identify which question or questions are most likely to need to be answered

# Research Questions

- A process of reflection must be carried out prior to starting the review, after which comes a redefinition of the issues
  - Questions should be avoided in systematic reviews that are very general and have little depth in the topics
  - That is why it is so important to refine them, so that they become much more specific questions that encompass these generic nuances
  - The aim is to carry out a much more refined systematic review to avoid general results that would be easy to obtain with a narrative review of the literature

# Example: Research questions for a mapping [65]

MQ1: How many studies were published over the years?

MQ2: Who are the most active authors in the area?

MQ3: Which publication vehicles are the main targets for research production in the area?

MQ4: In which domains has pragmatic interoperability been applied? (e.g. Bioinformatics, Telemedicine, Business)

MQ5: Which type of computational support has pragmatic interoperability techniques provided (e.g. framework, software architecture, etc.)?

MQ6: Which definitions of pragmatic interoperability have been used?

# Example: Research Questions for an SLR [65]

**RQ1: Which solutions have been used to enhance pragmatic interoperability?**

**RQ2: How did the proposed solutions address pragmatic interoperability?**

# Define the review protocol

- The rigor and reliability of systematic reviews are based, in large part, on the prior planning and documentation of a methodical approach to their conduct, i.e., on a protocol
- A systematic review protocol is important for several reasons [66]
  1. It allows you to plan carefully and therefore anticipate potential problems
  2. It allows you to explicitly document what has been planned before beginning your review, allowing others to compare the protocol and the completed review (i.e., identify selective information), replicate review methods if desired, and judge the validity of planned methods
  3. Prevents arbitrary decision-making regarding inclusion criteria and data extraction
  4. You can reduce duplication of effort and improve collaboration

# Definition of "Systematic Review Protocol"

In the context of systematic reviews and meta-analyses, a protocol is a document that presents an explicit scientific "roadmap" for a planned, uninitiated systematic review. The protocol details the rational and planned methodological and analytical approach to the review [66]

# Protocol for conducting a systematic review

- The main steps in conducting a systematic review have been drawn from healthcare [67] and can be summarized [68]
  - Define your search terms
  - Identify databases and search engines, as well as journals that may need to be accessed manually, and query with the selected search terms
  - Decide and apply filters for inclusion and exclusion
  - Ensure that the resulting articles are representative by repeating the filtering process
- Variations of this protocol can be used
- Whatever protocol is used, it has to be carefully documented to be transparent
  - Other researchers must be able to follow the same procedures and obtain the same results
  - This will greatly help its external validity

# Examples of sections of a protocol [67]

## **Title**

### **Protocol**

- Background
- Objectives
- Methods
- Criteria for selecting studies for this review
- Search methods for identification of studies
- Data collection and analysis

## **Appendices**

### **Information**

- Authors
- Contributions of authors
- Sources of support
- Declarations of interest
- Acknowledgements

## **References**

- Additional references\*

## **Figures and Tables**

# Main elements to establish in the definition of the protocol

- Research Questions (include final version)
- Time frame
- Scope of the review
- Inclusion and exclusion criteria
- Quality criteria
- Data sources
- Search terms
- Canonical search equation

# Where to register protocols?

**PROSPERO:** <https://www.crd.york.ac.uk/prospero/>

- Database developed by the English National Health Service (NHS) to record systematic reviews worldwide. Appropriate for health screenings
- NO - Scoping review
- YES - Systematic reviews, Rapid reviews, and Umbrella reviews

**OSF (*Open Science Framework*):** <https://osf.io>

- Open platform to support your research and enable collaboration
- YES - Scoping review

• **IDESR (International Database of Education Systematic Reviews):** <https://idesr.org/>

- Database of systematic reviews published in Education
- Clearing-house for the registration of protocols of ongoing and planned systematic reviews

**Research Registry:** <https://www.researchregistry.com>

- Registration with cost
- All types of reviews and types of studies, including observational studies

# Time frame

- The time frame must be adjusted to meet the objective sought, but with a view to the efficiency of the process
- Sometimes it is raised as an exclusion criterion
- This decision will result in restriction criteria when executing searches in the selected databases

# Scope of the review

- Breaking down research questions to answer who, what, and how can help identify the fundamental elements of each research question [69]
- It is useful to use a formal structure to focus the question and thus be able to break it down into the concepts that compose it
- There are several frameworks that can be used, but the most widely used is the PICOC (Population, Intervention, Comparison, Outcome, Context) framework [62]
- The PICOC framework applies to every step of the systematic review

# Scope of the review



---

<i>Population</i>	Who or what is the problem or situation you are dealing with? In a human population, for example, which age, sex, socioeconomic or ethnic groups are involved? What are the technical terms, synonyms, and related terms?
<i>Intervention</i> OR <i>Exposure</i>	<p>In what ways are you considering intervening in the situation? What sort of options do you have for tackling the problem? For example, this could be an educational intervention such as online tutorials on plagiarism (population = undergraduate students).</p> <p>NB: For non-intervention studies you may find it helpful to replace Intervention (a planned procedure) with Exposure (an unintentional occurrence or happening). For example, exposure to radio waves from mobile phone transmitters.</p>
<i>Comparison</i>	<p>What is the alternative? This is optional. For when you wish to consider, for example, the effect of two or more interventions, comparing their outcomes possibly in terms of what they deliver and/or cost. So you may want information on the relative merits of:</p> <ul style="list-style-type: none"><li>• buses versus trams for urban congestion;</li><li>• natural versus chemical methods of agricultural pest control;</li><li>• surgery versus drugs for an illness.</li></ul>
<i>Outcome(s)</i>	How is it measured? This may be more difficult to identify: you have a technical terminology for your problem and a range of management options, but what do you want to achieve? This stage does, however, focus your mind on what your desired outcome(s) might be and how you will assess the impact - what you are going to measure and how.
<i>Context</i>	What is the particular context of your question? Are you looking at specific countries/areas/settings?

# Scope of the review

- Population (P)
- Intervention (I)
- Comparison (C)
- Outcomes (O)
- Context (C)

Who?

What? How?

What to compare with?

What are you looking to achieve/improve?

In what type of organization and under what circumstances?

# PICOC example [35]

Population (P): The target group for the investigation: Software architectures

Intervention (I): specifies the investigation aspects or issues of interest for the researchers: provide support or analyze HCI / HMI processes

Comparison (C): the aspect of the investigation with which the intervention is being compared to. No comparison intervention has been planned

Outcomes (O): the effect of the intervention: Software Architectures proposals and real-world experiences

Context(C): the setting or environment of the investigation: environments related to HCI / HMI (in the industry, academia, etc.)

# PICOC example [46]

- Population (P): systematic literature reviews and mappings
- Intervention (I): conduct a systematic literature review about software architecture and model driven engineering in technological ecosystems
- Comparison (C): no comparison
- Outputs (O): the systematic reviews and mappings about technological ecosystems
- Context (C): contexts related to technological and software ecosystems

# Inclusion and exclusion criteria

- After defining the research issues and objectives, the next step in a systematic literature review is to define the inclusion and exclusion criteria of the studies
- It is important to define both, although they are often the antagonistic expression of a concept, but in this way, an acceptance or rejection criterion can be assigned to each article of the dataset that is being handled

# Inclusion and exclusion criteria

- The objective of these criteria is to discard documents that have been recovered in the search phase, but that lack the minimum conditions established by the objectives of the review
- Only those that deserve it based on these two aspects are expected to be part of the set of documents
  - **Formal criteria**, such as those referring to the type of document, accessibility to the full text, its license of use, language, geographical area, date of publication, review process, etc.
  - **Criteria for the adequacy of the documents found for the themes and objectives of the review**, as false positives may have occurred

# Inclusion and exclusion criteria. Example [65]

- IC1: The papers proposed a pragmatic interoperability solution (method, technique, model, tool, framework) AND
- IC2: The proposed solution are applied on software OR system OR application OR service OR infrastructure AND
- IC3: The proposed solution supports machine to machine pragmatic interoperability AND
- IC4: The papers are written in English language AND
- IC5: The papers are reported in peer reviewed Workshop or Conference or Journal or Technical Reports.

# Inclusion and exclusion criteria. Example [65]

EC1: The papers do not propose a pragmatic interoperability solution OR

EC2: The proposed solution are not applied on software OR system OR application OR service OR infrastructure OR

EC3: The proposed solution does not support machine to machine pragmatic interoperability OR

EC4: The papers are not described in English OR

EC5: The papers are not published in a peer reviewed conference or journal

# Quality criteria

- Studies that are selected in the systematic review process may have weaknesses or shortcomings
- The objective is to identify the gaps to decide whether the contribution of each work is interesting for the systematic review or not
- A checklist should be designed to check the relevant aspects of the selected items
- The list will be composed of a series of criteria that will be evaluated and scored for each selected article according to a defined metric
- Depending on the assessment score, each item would be included or excluded in the final phase of selection
- Those responsible for the development of the systematic review will set the cut-off point of the articles for their final inclusion in the corpus, on which the analysis of results will be carried out

# Quality criteria

- The quality criteria usually refer to the quality of the research and the results presented by the candidate article to be included in the final corpus or document bank
- Dixon-Woods et al. [70] propose 5 criteria in the form of a list of questions that, due to their breadth, can be of general use to apply quality criteria
  1. Are the purposes and objectives of the research clearly stated?
  2. Is the research design clearly specified and appropriate for the purposes and objectives of the research?
  3. Is a clear explanation provided of the process by which the findings were obtained?
  4. Is there enough data to support interpretations and conclusions?
  5. Is the method of analysis appropriate and adequately explained?

# Quality criteria. Example [35]

Question	Score
1. Are the research aims related to software architectures & HCI/HMI clearly specified?	Y/N/partial
2. Was the study designed to achieve these aims?	Y/N/partial
3. Are data presented on the evaluation of the proposed solution?	Y/N/partial
4. Are data presented on the assessment regarding the human part of HCI/HMI?	Y/N/partial
5. Is the software architecture clearly described and is its design justified?	Y/N/partial
6. Are the devices involved clearly specified? Are their functions within the software architecture justified?	Y/N/partial
7. Do the researchers discuss any problems with the software architecture described?	Y/N/partial
8. Is the solution based on a software architecture tested in a real context?	Y/N/partial
9. Are the links between data, interpretation and conclusions made clear?	Y/N/partial
10. Are all research questions answered adequately?	Y/N/partial

# Data sources

- The data sources from which the primary sources of the systematic review are to be sought must be selected and justified
- The suitability of the data source with respect to the discipline and having online access to its query must be evaluated
  - Except for special circumstances (such as a systematic review of research projects [71]), the privileged source of systematic reviews is articles published in peer-reviewed scientific journals, since they constitute, in general, the preferred (and most reliable, precisely because they are evaluated) way of communicating the advances of a scientific discipline, its main controversies, and open fronts. etc. [72]
  - In the Social Sciences and Humanities, books and book chapters are of great importance
  - In other disciplines, such as Computer Science or Computer Engineering, the proceedings of the congresses are especially representative
- You do not have to limit yourself only to the largest databases, but you must be aware of the objectives you are looking for and the effort that will have to be made
  - For example, it is not the same to carry out a systematic review for a doctoral thesis as it is to know the current state of a line of research in recent years
- Determine if grey literature sources are to be included

# Data sources

- Tipos de bases de datos
  - Multidisciplinary databases
    - Legitimizing Role of Science
      - International: Web of Science, Scopus
      - National (Spain): CSIC Databases, Dialnet Plus
  - Specialized databases
    - Magazines
    - Projects [71]
  - Other sources
    - Grey literature
    - Preprints

# Data sources

Some of the most used data sources (not a list that claims to be complete)

- WoS
- Scopus
- Google Scholar
- Scielo
- IEEEXplore
- ACM
- Springer
- ScienceDirect
- Emerald Insight
- Compendex
- ERIC
- Pubmed
- LISA
- LISTA
- Dialnet Plus
- arXiv
- etc.

# Data sources, how many to use?

- Each review job is unique, and data sources must be specified and justified in your protocol definition
- General recommendations (adapted from [72])
  - Select at least one of the internationally recognized databases (WoS, Scopus) and combine it with a more local source if the scope of the study requires it (Dialnet Plus, Scielo, etc.).
  - Try several of the specialized databases and keep the ones that provide the best results (a couple of them at most)
  - If gray literature is relevant to the study, consider Google Scholar, but caution should be exercised because of the large number of results and the possible "noise" that may be obtained
  - Consult any other source that is appropriate for the type of study to be carried out

# Search terms

- Before formulating a search equation, the search terms must be clearly and precisely established, and then the logical relationships that will occur between them must be established
- The PICOC analysis must be considered to identify them
- The terms must be organized according to the search strategy that has been decided
- Synonyms can be defined
- If different languages are supported, the ontology of equivalences between the languages to be considered must be established
- Wildcards can be used

# Search terms. Example [73]

Initial Logic Grid Aligned with the PICO Elements of the Review Question

Population	Intervention	Comparison intervention	Outcome measures
Dementia	Animal-assisted therapy	Music therapy	Aggressive behavior

Logic Grid with Identified Keywords Added

Population	Intervention	Comparison intervention	Outcome measures
Dementia Alzheimer Huntington Kluver Lewy	Animal-assisted therapy Animal-assisted activities Animal-assisted interventions Animal therapy Pet therapy Dog therapy Dog-assisted therapy Canine-assisted therapy Pet-facilitated therapy Aquarium	Music therapy Music Singing Sing Auditory stimulation	Aggression Neuropsychiatric Apathy inventory Cornell scale Cohen Mansfield BEHAVE-AD CERAD-BRSD Behavior Behaviour

# Search terms

- Framework **FDC** [72]
  - **Facet**: consider all the characteristic facets of academic research, such as the object of study, the theoretical framework, the methodological framework, etc.
  - **Derive**: For each facet, derive the keywords that represent it, including synonyms and variations in the different languages contemplated
  - **Combine**: Once a group of keywords is available, they are combined into a group of search equations

# Search terms. Facets [72]

- In order not to overlook any key aspect of the research, some facets are considered, from which to derive the keywords
- They correspond to the examination of various documents and sources (e.g., components of a research project, evaluation rubric for an academic work, parts of a doctoral thesis, sections of a scientific publication, etc.)

# Search terms. Facets [72]

- **Object of study:** Identify the material or conceptual object on which the research is focused
- **Type of action:** Identify the type of activity that best fits the study
- **Theoretical framework:** Theories or disciplines that inform and contribute the main conceptual constructs of the study
- **Data collection techniques:** Specific techniques with which data are intended to be obtained for research
- **Methodological strategies:** Identify the methodologies to be used
- **Place names:** Names of places, regions or countries involved in the study
- **Proper names:** Names of prominent authors or representatives of theoretical currents involved in the study. Proper names of companies or corporations that have some relationship with the study
- **Software or tools:** Names of software packages or instruments or tools that are intended to be used in research

# Canonical search equation

- Once the terms for each concept within the search strategy have been identified, one or more canonical equations must be proposed using Boolean logic to combine the terms appropriately
- These canonical equations will be adapted at the stage of the review to each of the selected data sources
- Boolean logic allows you to combine search terms using the logical operators AND, OR, NOT to design the search strategy
- Hart explains Boolean logic as a way of "adding, subtracting, and multiplying search terms to enlarge (add), reduce (subtract), or include terms (multiply or combine) in the search" [74]

# Canonical search equation

- An effective search equation would be one formed by descriptors and their corresponding qualifiers combined with each other using the most appropriate Boolean operators [11]
  - To join related concepts, the OR (union) operator will be used. For example, synonyms are related to each other with the OR operator
  - To relate terms that refer to different concepts in the same document, the AND (intersection operator) will be used
  - To remove documents containing the unwanted term, NOT (exclusion operator) will be used
  - When formulating more complex search equations, in which several operators are combined, parentheses should be used to indicate which operation should be performed first

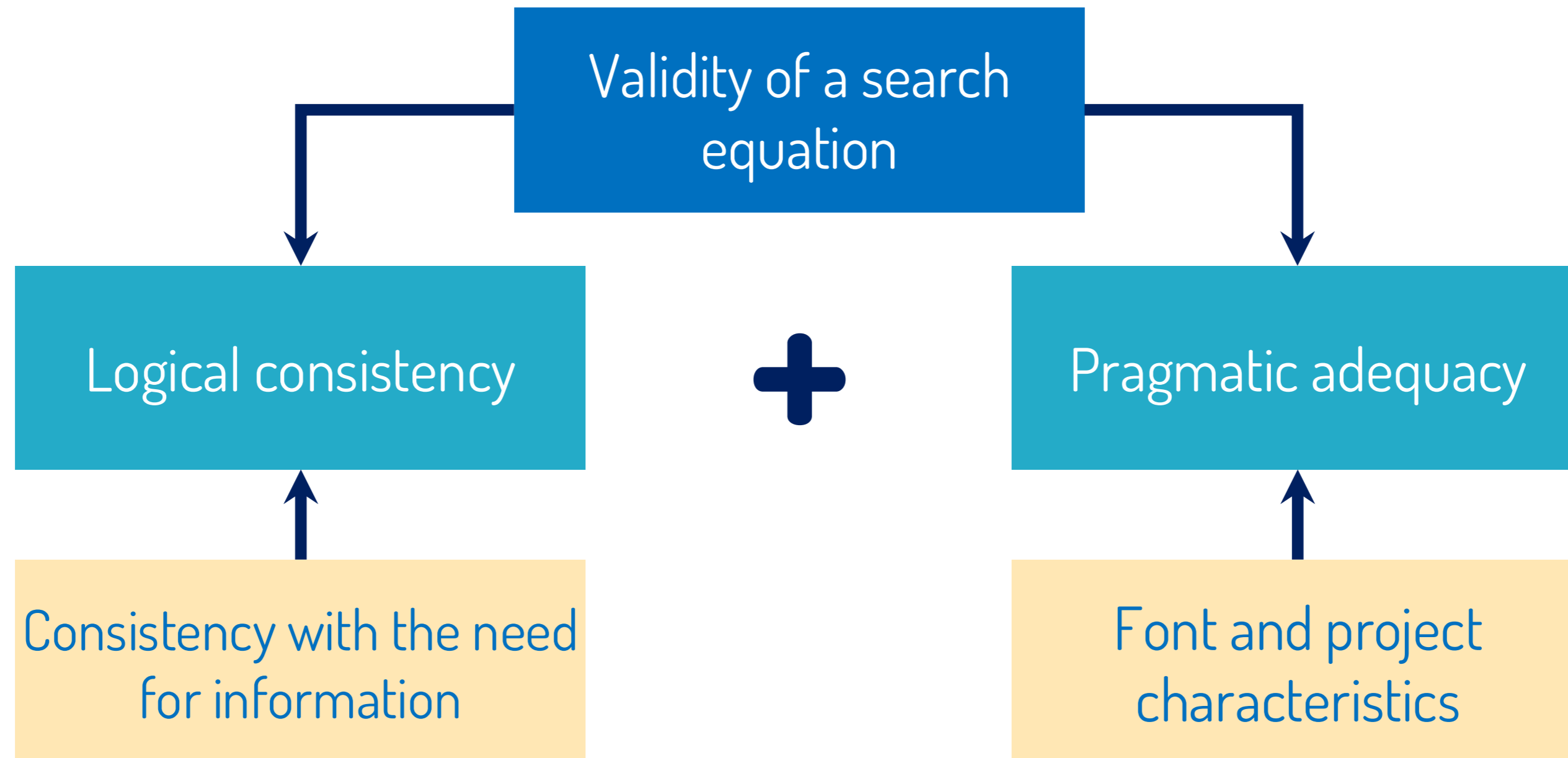


# Canonical search equation. Example [35]

*(“software architectur\*” AND ((HCI OR “Human-Computer Interaction” OR “Human Computer Interaction”) OR (HMI OR “Human-Machine Interaction” OR “Human Machine Interaction”)))*

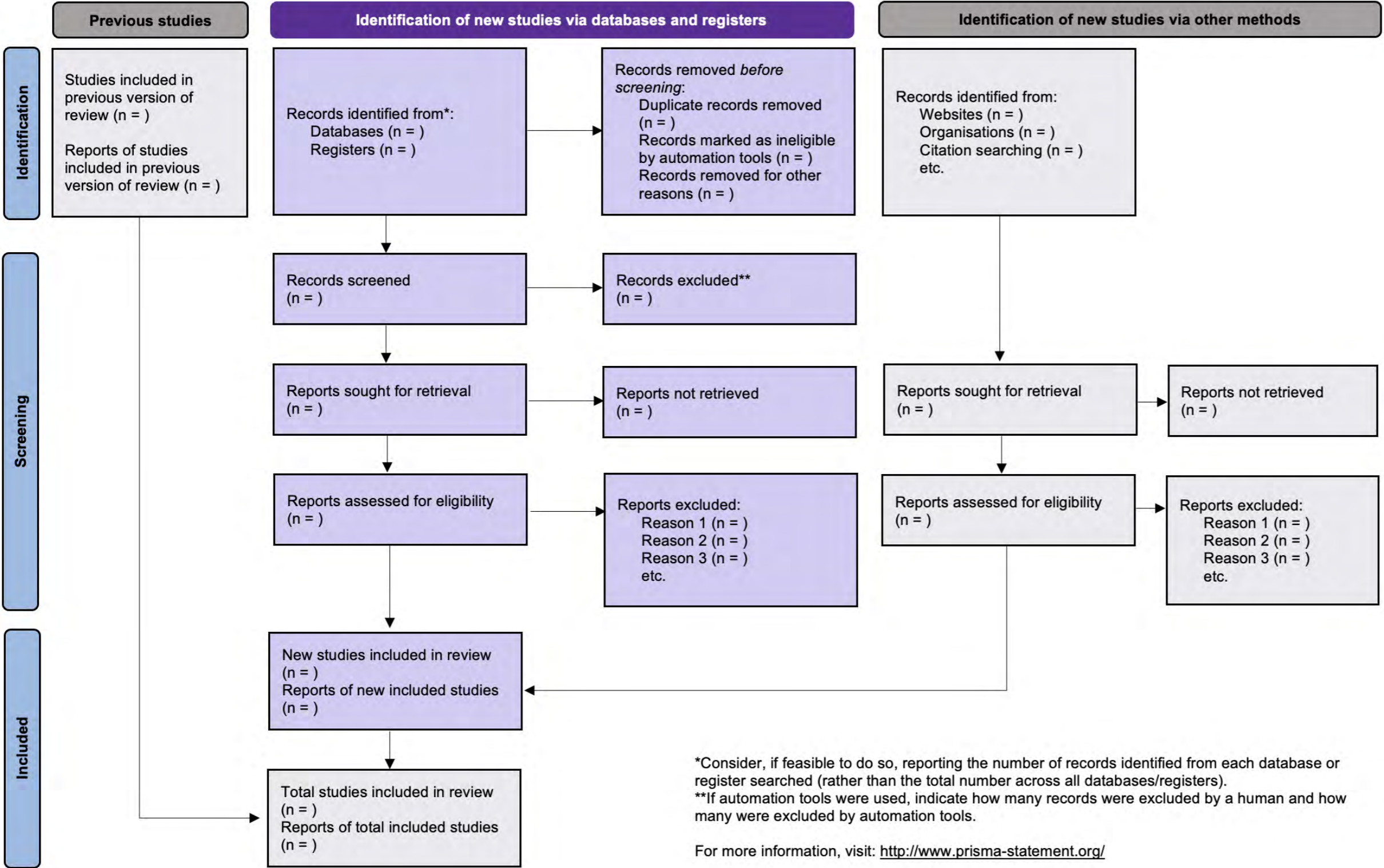
# Validity condition of a search equation [75]

- For a search strategy to be valid, it must present both logical consistency and pragmatic adequacy



## 5. Conducting the review phase

# Phases of the review [56, 57]



# Phases of the review – PRISMA 2020 [56, 57]

## 1. Identification

- Run the queries and get the logs
- Remove duplicates

## 2. Screening

- Review titles and abstracts (applying inclusion and exclusion criteria)
- Review the full text and assess quality (also applying inclusion and exclusion criteria)
- Add (if necessary) documents cited in your results (provided they meet the inclusion and exclusion criteria and the quality criteria)

## 3. Inclusion

- Define the final corpus of studies selected for the qualitative study and/or for the quantitative study

# Identify relevant research

- The planned search strategy is implemented
- Search all selected data sources by adapting the canonical equation to each data source's own search language/interface
  - An attempt should be made to ensure that the queries in the different data sources are equivalent; the results obtained may not be comparable
  - Each adaptation of the canonical equation for each data source must be documented
    - When using a search interface, many systems translate the search into an equation that must be included in the process documentation

# WoS search interface



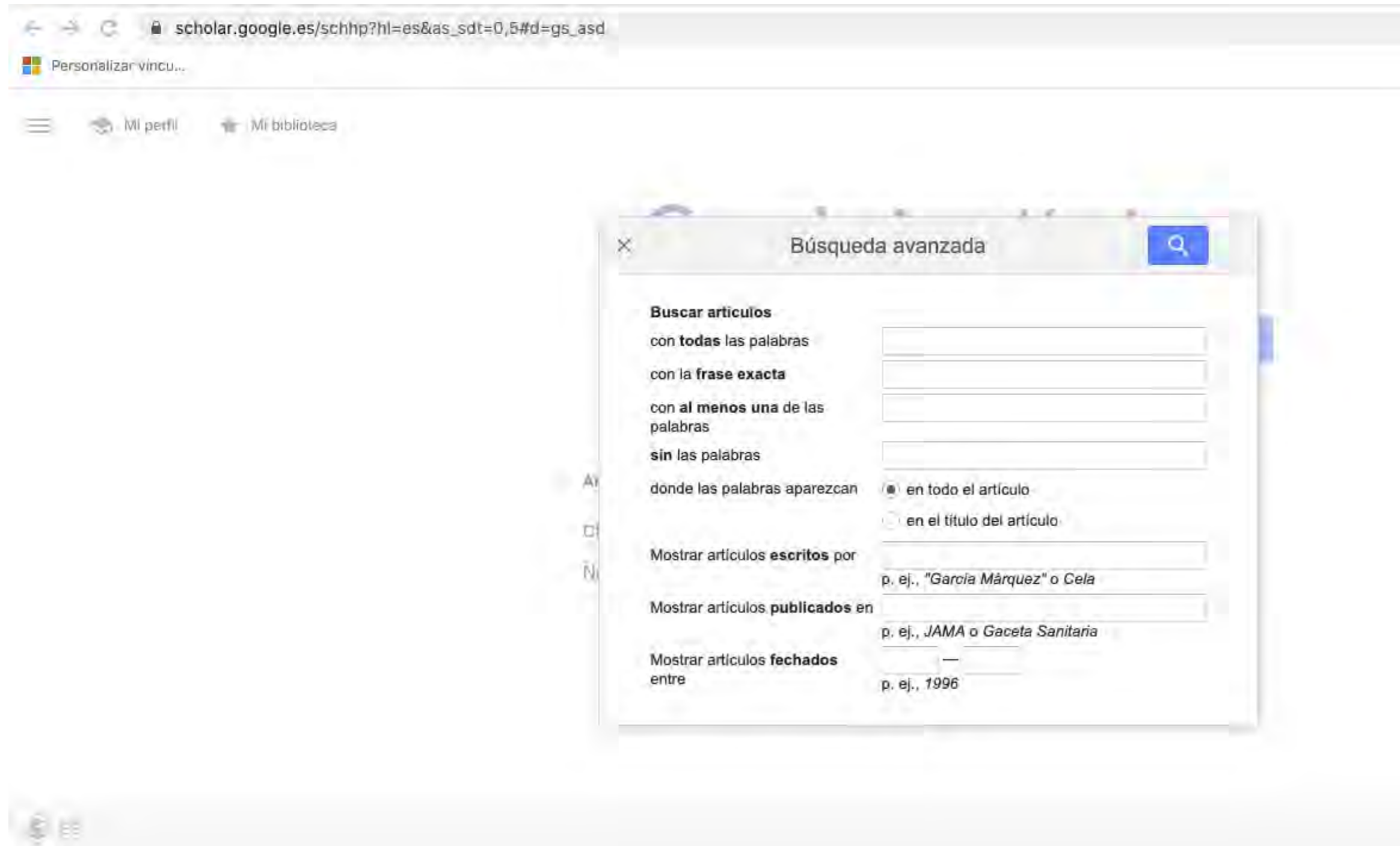
The screenshot shows the Web of Science search interface. At the top, there is a navigation bar with the Clarivate logo, language options (English), and a Products menu. Below this is a secondary navigation bar with 'Web of Science' and links for Search, Marked List, History, and Alerts. On the right side of this bar are 'Sign In' and 'Register' buttons. The main content area features a large purple banner with the text 'Discover multidisciplinary content from the world's most trusted global citation database.' Below the banner is a search box with a dropdown menu set to 'Web of Science Core Collection'. The search box has tabs for 'DOCUMENTS', 'AUTHORS', and 'CITED REFERENCES'. A dropdown menu is open, showing 'All Fields' selected, with other options like Topic, Title, Author, Publication Titles, Year Published, Affiliation, and Publisher. To the right of the dropdown is a search input field containing the text 'Example: 2014 drexel decay radioactiv\*'. Below the input field are 'CLEAR' and 'SEARCH' buttons. A tooltip for 'All Fields' is visible, explaining that it searches all searchable fields with one query and provides the same example query.

# Scopus search interface



The screenshot shows the Scopus search interface. At the top left, there is the logo of the University of Salamanca and the Scopus logo. The top right contains navigation links for Search, Sources, Lists, and SciVal, along with icons for help, notifications, and institutional access, and buttons for 'Create account' and 'Sign in'. The main heading is 'Start exploring' with the tagline 'Discover the most reliable, relevant, up-to-date research. All in one place.' Below this are tabs for 'Documents', 'Authors', and 'Affiliations'. A search bar is present with a dropdown menu for 'Search within' (set to 'Article title, Abstract, Keywords') and a text input field for 'Search documents \*'. A 'Search tips' link is on the right. Below the search bar are links for '+ Add search field', '+ Add date range', and 'Advanced document search >'. At the bottom, there are three columns of links: 'About Scopus' (What is Scopus, Content coverage, Scopus blog, Scopus API, Privacy matters), 'Language' (日本語に切り替える, 切换到简体中文, 切换到繁體中文, Русский язык), and 'Customer Service' (Help, Contact us). The footer includes the Elsevier logo, links for 'Terms and conditions' and 'Privacy policy', copyright information for Elsevier B.V., a cookie consent message, and the RELX logo.

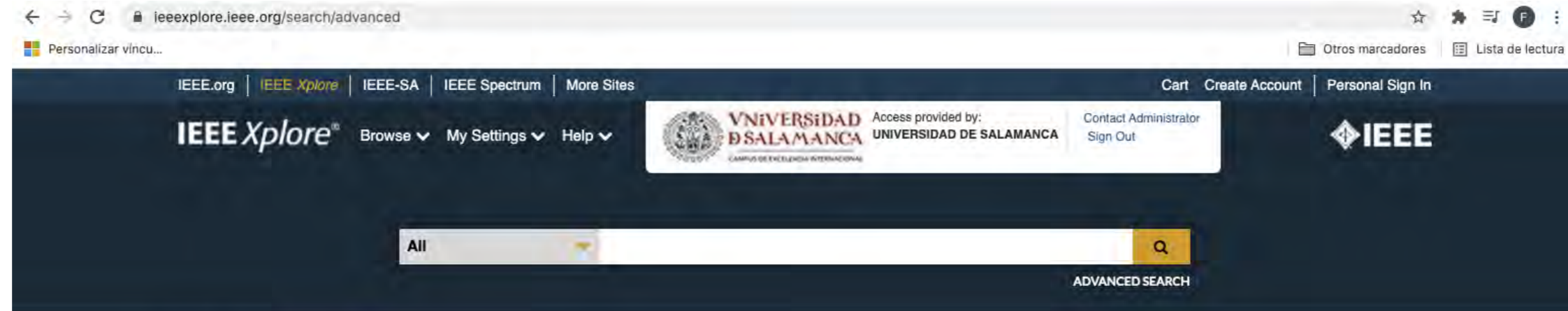
# Google Scholar advanced search interface



# ScienceDirect advanced search interface

The screenshot displays the ScienceDirect advanced search interface. At the top, there is a navigation bar with the ScienceDirect logo, a 'Journals & Books' link, and buttons for 'Register' and 'Sign in'. The main heading is 'Advanced Search'. Below this, there is a 'Search tips' link. The search area contains several input fields: 'Find articles with these terms', 'In this journal or book title', 'Year(s)', 'Author(s)', 'Author affiliation', 'Volume(s)', 'Issue(s)', 'Page(s)', 'Title, abstract or author-specified keywords', 'Title', 'References', and 'ISSN or ISBN'. A 'Search' button is located at the bottom right of the search area.

# IEEE Xplore advanced search interface



## Advanced Search [?](#)

Advanced Search | Command Search | Citation Search

Enter keywords and select fields.

Search Term in All Metadata [?](#)

AND Search Term in All Metadata [↑](#) [×](#)

AND Search Term in All Metadata [↑](#) [×](#) [+](#)

[Preferences](#)

[Learn More](#)

[Data Fields](#)

[Search Examples](#)

[Search Operators](#)

[Search Tips](#)

### Publication Year

Documents Added Between: 03/31/2021 and 04/07/2021

Specify Year Range

1884 2021

From To

1884 2021

[Reset All](#) [Search](#)

# ACM Digital Library advanced search interface

Personalizar vínculo... Otros marcadores Lista de lectura

ACM DIGITAL LIBRARY Association for Computing Machinery Browse About Sign in Register

Journals Magazines Proceedings Books SIGs Conferences People Search ACM Digital Library

### Advanced Search

#### Search

Search anything within the ACM Digital Library or go to your [Saved Searches](#)

Search items from:  
The ACM Full-Text collection

Search Within  
Anywhere Enter Search term

Filters  
Published in Match All Enter Search term

Publication Date  
All dates  
Last  
Please Select  
Custom range  
From: Select Month Select Year  
To: Select Month Select Year

Clear

#### SEARCH TIPS for text fields

##### Boolean searches

Use the boolean operators **AND**, **OR**, and **NOT** to narrow or broaden your search results.

By default, an **AND** relationship is assumed between Search Within terms unless you specify a different operator in the **Edit Query**: input.

By default, an **OR** relationship is assumed between words within 1 Search Within term.

##### Searching for phrases

Enclose your search terms within quotation marks (" ") to search for an exact match of that phrase.

If no quotation marks are used, search results will be populated with publications that contain your search terms somewhere in the text.

For example, if you search for "machine learning" the search engine will limit the results to publications that contain this exact phrase otherwise an **OR** will be assumed in between the words.

Curly quotes (" ") are also acceptable eg. "machine learning"

**NOTE:** opening and closing quotes must be of the same type; curly or straight. Please avoid entering "machine learning"

##### Wildcards

Use an asterisk (\*) to specify any number of unknown characters. For example, if you search for **comput\***, the search engine will provide results that contain words such as compute, computation, computing, etc.

Use a question mark (?) to specify any single unknown character. For example, if you search for **compute?**, the search engine will provide results that contain words such as computer or computed **but not** computers because the question mark represents only one character.

**NOTE:** Wildcards cannot be used at the start of a search term or when searching for phrases within quotes.

##### Special Characters

The following characters have a special meaning when they appear in a query:

+ - && | ! ( ) { } [ ] ^ " ~ \* ? : /

To instruct Search to interpret any of these characters literally, rather as a special character, precede the character with a backslash character \

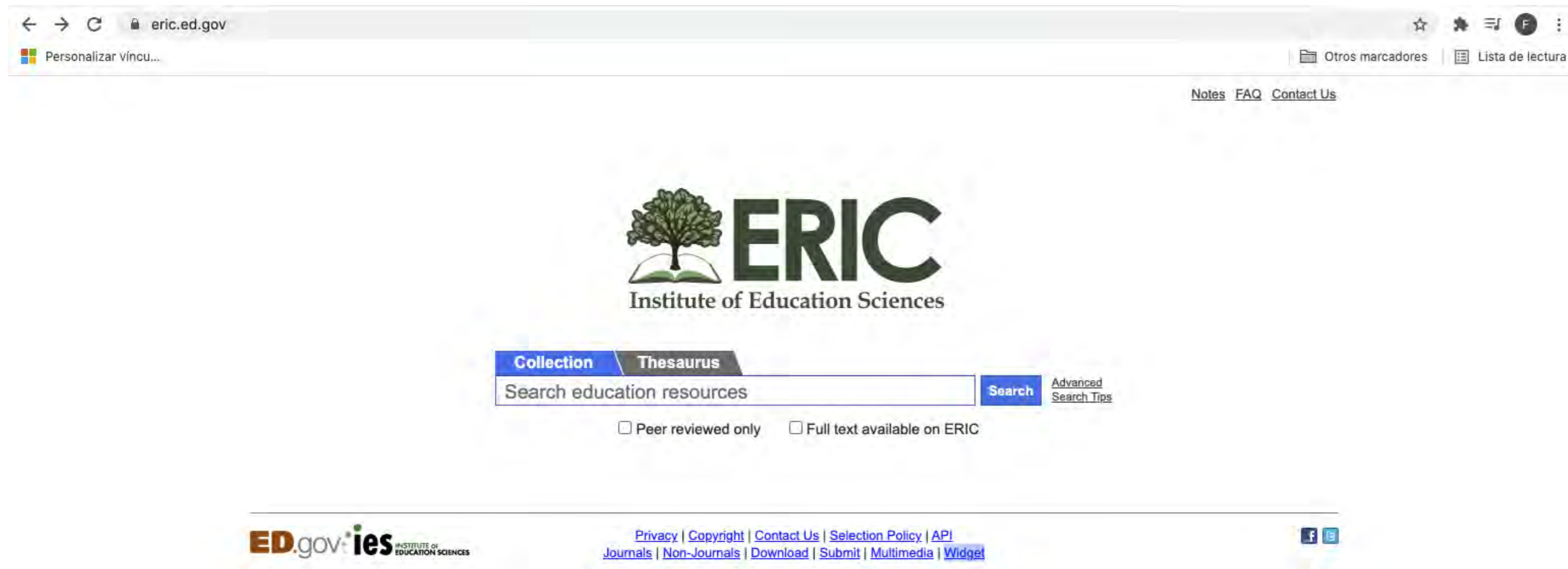
For example, the term *web-based* will search for *web NOT base* so either remove the space before - or escape it **web \-based** to find web-based documents.

Another example, *complexity n^2* is best to be searched with escaping **complexity n\^2** as ^ is interpreted as boost a term..

Feedback Categories About Join Connect



# ERIC search interface



The screenshot shows the ERIC search interface in a web browser. The address bar displays "eric.ed.gov". The page features the ERIC logo (a tree over an open book) and the text "ERIC Institute of Education Sciences". Below the logo, there are two tabs: "Collection" and "Thesaurus". A search bar contains the text "Search education resources" and a "Search" button. To the right of the search bar, there are links for "Advanced Search Tips". Below the search bar, there are two checkboxes: "Peer reviewed only" and "Full text available on ERIC". At the bottom of the page, there is a footer with the "ED.gov:ies" logo and a list of links: "Privacy", "Copyright", "Contact Us", "Selection Policy", "API", "Journals", "Non-Journals", "Download", "Submit", "Multimedia", and "Widget". There are also social media icons for Facebook and Twitter.

# ERIC search interface – advanced search



eric.ed.gov/?advanced

Personalizar vincu... Otros marcadores Lista de lectura

Notes FAQ Contact Us

**ERIC** Collection Thesaurus

Search education resources Search Advanced Search Tips

Peer reviewed only  Full text available on ERIC

### How does the ERIC search work?

ERIC will look for your search terms across a set of key ERIC fields: **title**, **author**, **source**, **abstract** and **descriptor**. You can also enter an ERIC accession number (ERIC ID) to search for the ERIC document itself, as well as documents that mention or cite the document by ID. An ISBN, ISSN or IES Grant/Contract Number may also be entered directly into the search box.

Ranking of results is determined by many factors including the publication date (more recent publications are favored).

This [video](#) helps users understand how to find information in an intuitive way and, in most cases, without the need for advanced search logic. The video demonstrates how simple search strategies can be an effective way to search the ERIC database.

### How do I create more specific searches?

- Use quotes to group words into specific phrases:
  - ["no child left behind"](#)
  - [maryland "no child left behind"](#)
  - ["west virginia" "no child left behind"](#)
- Use the **field:term** syntax to limit one or more search terms to a specific ERIC field:
  - [author:young](#)
  - [author:"john young"](#)
  - ["regression analysis" title:"test scores"](#)
  - [abstract:"no child left behind" pubyear:2002](#)
- Add the **field:term** syntax to limit searches to IES Funded and/or What Works Clearinghouse (WWC) Reviewed documents:
  - [funded:y](#) will show IES Funded documents.
  - For WWC Reviewed documents:
    - [wwcr:y](#) Meets Evidence Standards without Reservations
    - [wwcr:r](#) Meets Evidence Standards with Reservations
    - [wwcr:n](#) Does Not Meet Evidence Standards

### What other advanced options are available?

- You can use AND/OR to limit the search, with parentheses if required. For example, [\(prekindergarten OR kindergarten\) AND literacy](#) will return findings with either the term prekindergarten or kindergarten that also contain the word literacy.
- You can require search terms using the + symbol in front of one or more words or phrases in your search. For example, [+title:regression multivariate hierarchical linear](#) would return only results with the term regression, with the terms multivariate, hierarchical, and linear being optionally searched in all fields.
- You can exclude search terms using the - symbol in the same way you would use a + symbol. For example, for information on bullying, but not focused by sexual orientation, search [bullying -gay](#).
- You can combine any advanced syntax into a single search: [regression \(autism OR autistic\) -descriptor:"regression analysis" -descriptor:"regression \(statistics\)" descriptor:autism](#)

**ERIC field names**

- abstract
- assessment
- audience
- author
- descriptor
- educationlevel
- law
- location
- pubyear
- source
- title

**IES ERIC options**

- funded:Y
- wwcr:N
- wwcr:R
- wwcr:Y

ED.gov: ies INSTITUTE OF EDUCATION SCIENCES

Privacy | Copyright | Contact Us | Selection Policy | API  
Journals | Non-Journals | Download | Submit | Multimedia | Widget

f

## Consultation. Example [65]

- Web of Science

***TS=["software architecture" AND (HCI OR "Human-Computer Interaction")] AND analy\****

- Scopus

***TITLE-ABS-KEY ["software architecture" AND (HCI OR "Human-Computer Interaction")] AND analysis]***

# Consultation. Example [46]



- ☒ WoS:  
*TS=((“technological ecosystem\*” OR “software ecosystem\*” OR SECO OR “information ecosystem\*” OR “ERP ecosystem\*” OR “open ecosystem\*” or “learning ecosystem\*”) AND (SLR OR “Systematic Literature Review” OR “systematic mapping” OR “literature review”))*
- Scopus:  
*TITLE-ABS-KEY ( “technological ecosystem\*” OR “software ecosystem\*” OR seco OR “information ecosystem\*” OR “ERP ecosystem\*” OR “open ecosystem\*” OR “learning ecosystem\*”) AND TITLE-ABS-KEY ( slr OR “Systematic Literature Review” OR “systematic mapping” OR “literature review” ) AND ( LIMIT-TO ( DOCTYPE , “cp” ) OR LIMIT-TO ( DOCTYPE , “ar” ) OR LIMIT-TO ( DOCTYPE , “ch” ) OR LIMIT-TO ( DOCTYPE , “re” ) ) AND ( EXCLUDE ( SUBJAREA , “AGRI” ) OR EXCLUDE ( SUBJAREA , “MEDI” ) OR EXCLUDE ( SUBJAREA , “SOCI” ) ) AND ( LIMIT-TO ( LANGUAGE , “English” ) )*
- IEEE Xplorer:  
*(“technological ecosystem” OR “software ecosystem” OR SECO OR “information ecosystem” OR “ERP ecosystem” OR “open ecosystem” or “learning ecosystem”) AND (SLR OR “Systematic Literature Review” OR “systematic mapping” OR “literature review”)*
- ACM Digital Library:  
*((acmdlTitle: (“technological ecosystem” OR “software ecosystem” OR SECO OR “information ecosystem” OR “ERP ecosystem” OR “open ecosystem” OR “learning ecosystem”) OR recordAbstract: (“technological ecosystem” OR “software ecosystem” OR SECO OR “information ecosystem” OR “ERP ecosystem” OR “open ecosystem” OR “learning ecosystem”)) AND (acmdlTitle: (SLR OR “Systematic Literature Review” OR “systematic mapping” OR “literature review”) OR recordAbstract: (SLR OR “Systematic Literature Review” OR “systematic mapping” OR “literature review”))*

# Proximity operators in consultations

- Some data sources allow you to use proximity operators
- They are interspersed between the descriptors to establish a relationship of proximity between them; that is, they allow the position of two or more words in the search equation to be specified
- Each data source has its own proximity operators, with small differences between them, so it is always advisable to consult the help they offer

# Proximity operators in WoS

- **NEAR/x**
  - It is used to find records in which the terms joined by the operator are separated from each other by a maximum number of x words
  - If the number of words (/x) is omitted, a value of 15 words will default to
  - The value 0 indicates that the words related to the NEAR operator must be followed, i.e., adjacent: monetary NEAR/0 union
    - Example: TOPIC1 NEAR/5 TOPIC2
  - You cannot use the AND operator in queries that include the NEAR operator. For example, the following query is invalid: TS = (Germany NEAR/10 (monetary AND union))
  - NEAR can be used to find a separate word or phrase X number of words in a sentence: TS = (Germany NEAR/10 "monetary union")

# Proximity operators in WoS

- **SAME**

- Searches in the address field use SAME to restrict the search to terms that appear at the same address within a complete record
- Parentheses should be used to group the terms of the address
  - Example: AD=(McGill Univ SAME Quebec SAME Canada) searches for records in which McGill University appears in the Addresses field of an entire record along with "Quebec" and "Canada"
- SAME works exactly like AND when used in other fields (for example, in the Subject and Title fields)

# Operator precedence in WoS

1. NEAR/x
2. SAME
3. NOT
4. AND
5. OR

# Example of a search equation using NEAR [76]

[(meta-dashboard\*) **OR**  
 [(dashboard\*) NEAR/10 (custom\* OR personal\*  
 OR adapt\* OR flexib\* OR config\* OR driven OR  
 generat\* OR compos\* OR template\* OR context-  
 aware OR select\*)] **OR**  
 [(dashboard\*) AND [(heterogeneous OR different  
 OR diverse OR dynamic) NEAR/0  
 ("requirement\*" OR "stakeholder\*" OR "user\*" OR  
 "need\*" OR "task\*" OR "necess\*")]]] **AND NOT**  
 [car OR vehicle OR automo\*]

# Proximity operators in Scopus

- **Pre/x**
  - Find results where one word precedes the other x words
  - Order matters
    - Example: TITLE-ABS-KEY ( dashboard PRE/3 personalization )
- **W/x**
  - It indicates the distance between the two words, but the order of the words does not matter
    - Example: TITLE-ABS-KEY ( dashboard W/3 personalization )

# Proximity operators in Scopus

- **General rules for proximity operators in Scopus**
  - Wildcards can be used ? and \*
    - Example: TITLE-ABS-KEY(ship\* PRE/0 channel)
  - You can use more than one proximity operator in sequence to connect multiple terms, but you can't mix operator types or include different values for "x" within the same expression
    - Example : TITLE-ABS-KEY(bay PRE/6 ship\* PRE/6 channel) - Valid
    - Example : TITLE-ABS-KEY(bay PRE/6 ship\* PRE/0 channel) - Invalid
    - Example : TITLE-ABS-KEY(bay W/6 ship\* PRE/6 channel) - Invalid
  - Multiple and different operators can be included, as well as different values for "x" in the same search, but not within the same expression
    - Example: TITLE-ABS-KEY((b?y W/6 ship\*) AND (ship\* PRE/0 channel) AND NOT (channel W/0 isl\*))

# Operator Precedence in Scopus

1. OR
2. W/x, Pre/x
3. AND
4. AND NOT

# The search equation is completed with the filters that the databases allow



The screenshot shows the Scopus search interface. At the top left, there is the logo for 'UNIVERSIDAD DE SALAMANCA' and the Scopus logo. The top navigation bar includes 'Search', 'Sources', 'Lists', 'SciVal', and user options like 'Create account' and 'Sign in'. The main heading is 'Start exploring' with the tagline 'Discover the most reliable, relevant, up-to-date research. All in one place.' Below this, there are tabs for 'Documents', 'Authors', and 'Affiliations'. The search bar contains the query 'dashboard\* PRE/10 custom\*'. A blue oval highlights the filter section, which includes: 'Search within' (Article title, Abstract, Keywords), 'Published from' (2015) and 'To' (Present), and 'Added to Scopus' (Anytime). At the bottom of the filter section, there are links for '+ Add search field', 'Remove date range', and 'Advanced document search'. The footer contains 'About Scopus', 'Language' options (Japanese, Simplified Chinese, Traditional Chinese, Russian), 'Customer Service' (Help, Contact us), and the Elsevier logo. Copyright information and a cookie notice are also present.

44 document results

TITLE-ABS-KEY (dashboard\* PRE/10 custom\*) AND PUBYEAR > 2014

Edit Save Set alert

Search within results...

Refine results

Limit to Exclude

Open Access

All Open Access (14)

Gold (7)

Bronze (3)

Green (8)

Learn more

Year

Author name

Subject area

Computer Science (32)

Engineering (18)

Decision Sciences (6)

Medicine (6)

Business, Management and Accounting (4)

View more

Document type

star el formato de una ubicación y aplicarlo en otra

Article (15)

Review (2)

Book Chapter (1)

Conference Review (1)

View more

Publication stage

Source title

Keyword

Affiliation

Funding sponsor

Country/territory

Source type

Language

English (44)

Limit to Exclude

Export refine

Documents Secondary documents Patents

View Mendeley Data (357)

Analyze search results

Show all abstracts Sort on: Date (newest)

All Export Download View citation overview View cited by Add to List

Document title Authors Year Source Cited by

1 HOPE: An integrative digital phenotyping platform for data collection, monitoring, and machine learning Wang, X., Vouk, N., Heaukulani, C., (...), Lee, J., Morris, R.J.T. 2021 Journal of Medical Internet Research 23(3),e23984 0

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2 ZEUS 2021 - Proceedings of the 13th European Workshop on Services and their Composition [No author name available] 2021 CEUR Workshop Proceedings 2839 0

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3 Augmented BIM Workflow for Structural Design Through Data Visualization Boechat, L.C., Corrêa, F.R. 2021 Lecture Notes in Civil Engineering 98, pp. 180-196 0

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4 Visual analytics approach to comprehensive meteorological time-series analysis Vuckovic, M., Schmidt, J. 2020 Data 5(4),94, pp. 1-16 0

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5 Multi-level systems engineering analyzer dashboard: A semi-automated content analysis for interview data Yu, Z., See Tao, H.Y., Xiao, Y., (...), Hutchison, N., Makwana, D. 2020 SYSCON 2020 - 14th Annual IEEE International Systems Conference, Proceedings 09275905 0

View abstract View at Publisher Related documents

6 Privacy Dashboards: The Impact of the Type of Personal Data and User Control on Trust and Perceived Risk Herder, E., Van Maaren, O. 2020 UMAP 2020 Adjunct - Adjunct Publication of the 28th ACM Conference on User Modeling, Adaptation and Personalization pp. 169-174 0

View abstract View at Publisher Related documents

7 Data dashboard: Exploring centralization and customization in personal data curation Vitale, F., Chen, J., Odom, W., Mcgreneere, J. 2020 DIS 2020 - Proceedings of the 2020 ACM Designing Interactive Systems Conference pp. 311-326 0

View abstract View at Publisher Related documents

8 A proof-of-concept framework for the preference elicitation and evaluation of health informatics technologies: The online PRESENT patient experience dashboard as a case example Mentzakis, E., Tkacz, D., Rivas, C. 2020 BMC Medical Informatics and Decision Making 20(1),95 0

View abstract View at Publisher Related documents

9 Bellevue Smart: Development and Integration of a Smart City Picardal, C., Pugliese, B., Rhee, S., (...), Kadiyala, R., Thompson, K. 2020 Journal - American Water Works Association 112(2), pp. 28-37 2

Open Access



The search equation is completed with the filters that the databases allow

# Advanced WoS query



Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

< BACK TO BASIC SEARCHES

### Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

All Fields  ADD TO QUERY

All Fields  
Topic  
Title  
Author  
Publication Titles  
Year Published  
Affiliation  
Publisher

**Topic**  
Searches title, abstract, author keywords, and Keywords Plus.  
Example:  
robot\*  
control\*  
"input shaping"

CLEAR SEARCH

GP=Group Author  
ED=Editor  
KP=Keyword Plus™

OO=Organization  
SG=Suborganization  
SA=Street Address

CI=City  
PS=Province/State  
CU=Country/Region  
ZP=Zip/Postal Code  
FO=Funding Agency  
FG=Grant Number  
FT=Funding Text  
SU=Research Area  
WC=Web of Science Categories

IS=ISSN/ISBN  
UT=Accession Number  
PMID=PubMed ID  
LD=Index Date  
DOP=Publication Date  
ALL=All Fields

History

Your history is currently empty.  
All your searches in the current session will appear here.

# Advanced WoS query



The screenshot shows the 'Advanced Search Query Builder' interface on the Web of Science website. At the top, there is a navigation bar with 'Clarivate', 'English', and 'Products'. Below this, the 'Web of Science' logo is followed by 'Search', 'Marked List', 'History', and 'Alerts'. 'Sign In' and 'Register' buttons are also present. The main content area has a header 'Advanced Search Query Builder' and a sub-header 'Search in: Web of Science Core Collection'. A search input field contains the query 'dapt\* OR flexib\* OR config\* OR driven OR generat\* OR compos\* OR template\* OR context-aware OR select\*' and is circled in blue. To its right is an 'ADD TO QUERY' button. Below the search field is a 'Query Preview' section with a text area for editing the query. A 'Field Tags' section lists various search criteria such as 'TS=Topic', 'TI=Title', 'AB=Abstract', etc. At the bottom, a 'History' section states 'Your history is currently empty.' The interface includes a 'SEARCH' button and a 'CLEAR' button.

# Advanced WoS query



The screenshot shows the Web of Science Advanced Search Query Builder interface. At the top, there is a navigation bar with the Clarivate logo, language options (English), and product information. Below this, the "Web of Science" logo is followed by links for Search, Marked List, History, and Alerts. On the right side of the navigation bar, there are "Sign In" and "Register" buttons.

The main content area is titled "Advanced Search Query Builder" and includes a link to "< BACK TO BASIC SEARCHES". Below the title, there is a dropdown menu for "Search in: Web of Science Core Collection".

The search input area contains a dropdown for "All Fields", a text input field with the query "Dashboard (near/10 (custom\* OR personal\* OR adapt\* OR flexib\* OR config\* OR driven OR generat\* OR compos\* OR template\* OR context-aware OR select\*))", a dropdown for "And", and an "ADD TO QUERY" button.

Below the search input, there is a "Query Preview" section showing the constructed query: "ALL=((dashboard\*) NEAR/10 (custom\* OR personal\* OR adapt\* OR flexib\* OR config\* OR driven OR generat\* OR compos\* OR template\* OR context-aware OR select\*))".

The "Field Tags" section lists various search fields and their abbreviations, such as TS=Topic, TI=Title, AB=Abstract, AU=Author, AI=Author Identifiers, AK=Author Keywords, GP=Group Author, ED=Editor, KP=Keyword Plus, SO=Publication Titles, DO=DOI, PY=Year Published, CF=Conference, AD=Address, OG=Affiliation, OO=Organization, SG=Suborganization, SA=Street Address, CI=City, PS=Province/State, CU=Country/Region, ZP=Zip/Postal Code, FO=Funding Agency, FG=Grant Number, FT=Funding Text, SU=Research Area, WC=Web of Science Categories, IS=ISSN/ISBN, UT=Accession Number, PMID=PubMed ID, LD=Index Date, and DOP=Publication Date. There are "X CLEAR" and "SEARCH" buttons next to the field tags list.

The "History" section at the bottom indicates that the user's history is currently empty and that all searches in the current session will appear there.

# Advanced WoS query



Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

< BACK TO BASIC SEARCHES

### Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

Topic (car OR vehicle OR automo\*) X Not **ADD TO QUERY**

More options

Query Preview

TS=((dashboard\*) NEAR/10 (custom\* OR personal\* OR adapt\* OR flexib\* OR config\* OR driven OR generat\* OR compos\* OR template\* OR context-aware OR select\*))

Field Tags X CLEAR SEARCH

Booleans: AND, OR, NOT

Field Tags:

TS=Topic	SO=Publication Titles	CI=City	IS=ISSN/ISBN
TI=Title	DO=DOI	PS=Province/State	UT=Accession Number
AB=Abstract	PY=Year Published	CU=Country/Region	PMID=PubMed ID
AU=Author	CF=Conference	ZP=Zip/Postal Code	LD=Index Date
AI=Author Identifiers	AD=Address	FO=Funding Agency	DOP=Publication Date
AK=Author Keywords	OG=Affiliation	FG=Grant Number	ALL=All Fields
GP=Group Author	OO=Organization	FT=Funding Text	
ED=Editor	SG=Suborganization	SU=Research Area	
KP=Keyword Plus*	SA=Street Address	WC=Web of Science Categories	

History

Your history is currently empty.  
All your searches in the current session will appear here.

# Advanced WoS query



Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

< BACK TO BASIC SEARCHES

### Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

Topic Example: oil spill OR medication And ADD TO QUERY

More options

Query Preview

```
{TS=((dashboard*) NEAR/10 (custom* OR personal* OR adapt* OR flexib* OR config* OR driven OR generat* OR compos* OR template* OR context-aware OR select*))} NOT TS=((car OR vehicle OR automo*))
```

Field Tags

Booleans: AND, OR, NOT

TS=Topic	SO=Publication Titles	CI=City	IS= ISSN/ISBN
TI=Title	DO=DOI	PS=Province/State	UT=Accession Number
AB=Abstract	PY=Year Published	CU=Country/Region	PMID=PubMed ID
AU=Author	CF=Conference	ZP=Zip/Postal Code	LD=Index Date
AI=Author Identifiers	AD=Address	FO=Funding Agency	DOP=Publication Date
AK=Author Keywords	OG=Affiliation	FG=Grant Number	ALL=All Fields
GP=Group Author	OO=Organization	FT=Funding Text	
ED=Editor	SG=Suborganization	SU=Research Area	
KP=Keyword Plus®	SA=Street Address	WC=Web of Science Categories	

X CLEAR SEARCH

History

Your history is currently empty.  
All your searches in the current session will appear here.

# Advanced WoS query



The screenshot shows the 'Advanced Search Query Builder' interface on the Web of Science website. At the top, there is a navigation bar with 'Clarivate', 'English', and 'Products'. Below this, the 'Web of Science' logo and navigation links like 'Search', 'Marked List', 'History', and 'Alerts' are visible. The main content area is titled 'Advanced Search Query Builder' and includes a dropdown menu for 'Search in: Web of Science Core Collection'. A search input field contains the example text 'Example: oil spill\* mediterranean'. Below the input field, there is a section for 'Select citation indexes from Web of Science Core Collection' with a dropdown menu set to 'All citation indexes'. A blue oval highlights this dropdown menu. Below the citation indexes, there is a 'Query Preview' section showing a complex search query: `(TS=((dashboard*) NEAR/10 (custom* OR personal* OR adapt* OR flexib* OR config* OR driven OR generat* OR compos* OR template* OR context-aware OR select*))) NOT TS=((car OR vehicle OR automo*))`. At the bottom, there is a 'Field Tags' section with a list of tags and their corresponding field names, such as 'TS=Topic', 'TI=Title', 'AB=Abstract', etc. The 'History' section at the very bottom indicates that the user's history is currently empty.

# Advanced WoS query



Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

< BACK TO BASIC SEARCHES

## Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

Topic  And  ADD TO QUERY

Less options

Select citation indexes from Web of Science Core Collection

- Social Sciences Citation Index (SSCI)
- Arts & Humanities Citation Index (A&HCI)
- Current Chemical Reactions (CCR-EXPANDED)
- Book Citation Index - Social Sciences & Humanities (BKCI-SSH)
- Conference Proceedings Citation Index - Science (CPCI-S)
- Emerging Sources Citation Index (ESCI)
- Science Citation Index Expanded (SCI-EXPANDED)
- Book Citation Index - Science (BKCI-S)
- Conference Proceedings Citation Index - Social Science & Humanities (CPCI-SSH)

TS=Topic	SO=Publication Titles	CI=City	IS= ISSN/ISBN
TI=Title	DO=DOI	PS=Province/State	UT=Accession Number
AB=Abstract	PY=Year Published	CU=Country/Region	PMID=PubMed ID
AU=Author	CF=Conference	ZP=Zip/Postal Code	LD=Index Date
AI=Author Identifiers	AD=Address	FO=Funding Agency	DOP=Publication Date
AK=Author Keywords	OG=Affiliation	FG=Grant Number	ALL=All Fields
GP=Group Author	OO=Organization	FT=Funding Text	
ED=Editor	SG=Suborganization	SU=Research Area	
KP=Keyword Plus™	SA=Street Address	WC=Web of Science Categories	

History

Your history is currently empty.  
All your searches in the current session will appear here.

# Advanced WoS query



Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

< BACK TO BASIC SEARCHES  
Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

Topic Example: "social" med/terrorism And ADD TO QUERY

Less options

Select citation indexes from Web of Science Core Collection

Social Sciences Citation Index (SSCI) Science Citation Index Expanded (SCI-EXPANDED) Emerging Sources Citation Index (ESCI)

Exact search

Query Preview

```
(TS=((dashboard*) NEAR/10 (custom* OR personal* OR adapt* OR flexib* OR config* OR driven OR generat* OR compos* OR template* OR context-aware OR select*))) NOT TS=((car OR vehicle OR automo*))
```

Field Tags

Booleans: AND, OR, NOT

TS=Topic	SO=Publication Titles	CI=City	IS= ISSN/ISBN
Ti=Title	DO=DOI	PS=Province/State	UT=Accession Number
AB=Abstract	PY=Year Published	CU=Country/Region	PMID=PubMed ID
AU=Author	CF=Conference	ZP=Zip/Postal Code	LD=Index Date
AI=Author Identifiers	AD=Address	FO=Funding Agency	DOP=Publication Date
AK=Author Keywords	OG=Affiliation	FG=Grant Number	ALL=All Fields
GP=Group Author	OO=Organization	FT=Funding Text	
ED=Editor	SG=Suborganization	SU=Research Area	
KP=Keyword Plus *	SA=Street Address	WC=Web of Science Categories	

History

Your history is currently empty.  
All your searches in the current session will appear here.

# Advanced WoS query



Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

< BACK TO BASIC SEARCHES

### Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

Topic Example: oil spill\* mediterranean\* And ADD TO QUERY

Less options

Select citation indexes from Social Sciences Citation Index Sources Citation Index (ESCI)

Exact search

**Exact search**

Turning on **Exact Search** will limit your search to the exact terms you enter into the search field.

By default (Exact search off), *Web of Science* will automatically expand searches in the Topic, Title, Abstract, Keywords, and Keywords Plus fields to help you find the most relevant results. For example, a search for *mouse* will return results with *mice*, and a search for *color* will return results *colour* or *colors*. *Web of Science* uses a combination of stemming and lemmatization to achieve this.

Field Tags

Booleans: AND, OR, NOT

Field Tags:	SO=Publication Titles	CI=City	IS=ISSN/ISBN
TS=Topic	DQ=DOI	PS=Province/State	UT=Accession Number
TI=Title	PY=Year Published	CU=Country/Region	PMID=PubMed ID
AB=Abstract	CF=Conference	ZP=Zip/Postal Code	LD=Index Date
AU=Author	AD=Address	FO=Funding Agency	DOP=Publication Date
AI=Author Identifiers	OG=Affiliation	FG=Grant Number	ALL=All Fields
AK=Author Keywords	OO=Organization	FT=Funding Text	
GP=Group Author	SG=Suborganization	SU=Research Area	
ED=Editor	SA=Street Address	WC=Web of Science Categories	
KP=Keyword Plus*			

History

Your history is currently empty. All your searches in the current session will appear here.

# Advanced WoS query

Clarivate English Products

Web of Science™ Search Marked List History Alerts Sign In Register

309 results from Social Sciences Citation Index (SSCI), Science Citation Index Expanded (SCI-EXPANDED), Emerging Sources Citation Index (ESCI):

Q (TS=((dashboard\*) NEAR/10 (custom\* OR personal\* OR adapt\* OR flexib\* OR config\* OR driven OR generat\* OR compos\* OR t...)) ANALYZE RESULTS CITATION REPORT CREATE ALERT

Copy query link

Refine results

Search within results for...

Quick Filters

- Review Articles **New** 8
- Early Access 8
- Open Access 150

EXCLUDE REFINE

Publication Years

Search for Publication Years

Select all Date

- 2021 17
- 2020 70
- 2019 48
- 2018 38
- 2017 34
- 2016 23
- 2015 10
- 2014 12
- 2013 14
- 2012 6
- 2011 5
- 2010 6
- 2009 6
- 2008 5
- 2007 2
- 2006 4
- 2005 1
- 2004 1
- 2003 2
- 2001 1
- 1999 1
- 1995 2
- 1993 1

See less EXCLUDE REFINE

Document Types

- Articles 271
- Meeting Abstracts 17
- Editorial Materials 12
- Early Access 9
- Review Articles 8

See all EXCLUDE REFINE

0/309 ADD TO MARKED LIST EXPORT Relevance < 1 of 7 >

- 1 Learning analytics **dashboards** for **adaptive** support in face-to-face collaborative argumentation  
Han, J; Kim, KJ; (-); Cho, YH  
Apr 2021 | Computers & Education  
Despite the potential of learning analytics for **personalized** learning, it is seldom used to support collaborative learning particularly in face-to-face (F2F) learning contexts. This study uses learning analytics to develop a **dashboard** system that provides **adaptive** support for F2F collaborative argumentation (FCA). This study developed two **dash**... [Show more](#)  
Free Full Text From Publisher \*\*\* 73 References Related records
- 2 Studies on morphological, physico-chemical and mechanical properties of wheat straw reinforced polyester resin **composite**  
Haque, ME; Khan, MW and Rani, M  
Mar 2021 (Early Access) | Polymer Bulletin  
In this research, wheat straw (the agricultural by-product from the wheat plant, scientific name Triticum) reinforced unsaturated polyester resin **composites** were developed by applying a simple and easy technique to improve supportable **composite** materials. Therefore, untreated and sodium hydroxide-treated wheat straws have been used to form a ... [Show more](#)  
[View full text](#) \*\*\* 47 References Related records
- 3 Native Grasslands at the Core: A New Paradigm of Intensification for the Campos of Southern South America to Increase Economic and Environmental Sustainability  
Jaurena, M; Durante, M; (-); Lattanzi, FA  
Mar 5 2021 | Frontiers In Sustainable Food Systems  
Extensive livestock production in southern South America occupies similar to 0.5 M km(2) in central-eastern Argentina, Uruguay and southern Brazil. These systems have been sustained for more than 300 years by year-long grazing of the highly biodiverse native Campos ecosystems that provides many valuable additional ecosystem services. However, thei ... [Show more](#)  
[Free Full Text from Publisher](#) \*\*\* 103 References Related records
- 4 Using text mining to measure mobile banking service quality  
Leem, BH and Eum, SW  
Mar 2021 (Early Access) | Industrial Management & Data Systems  
Purpose The purpose of this study is to propose a method of measuring service quality as well as suggesting to detect **customer** complaints through analysis of **customer** online reviews of mobile bank, which is unstructured data. Design/methodology/approach This study uses text mining approach for **customer** online reviews ana ... [Show more](#)  
[Full Text at Publisher](#) \*\*\* 30 References Related records
- 5 Features Constituting Actionable COVID-19 **Dashboards**: Descriptive Assessment and Expert Appraisal of 158 Public Web-Based COVID-19 **Dashboards**  
Ivanovic, D; Barbazza, E; (-); Kringsos, D  
Feb 24 2021 | Journal Of Medical Internet Research  
Background: Since the outbreak of COVID-19, the development of **dashboards** as dynamic, visual tools for communicating COVID-19 data has surged worldwide. **Dashboards** can inform decision-making and support behavior change. To do so, they must be actionable. The features that constitute an actionable **dashboard** in the context of the COVID- ... [Show more](#)  
[Free Full Text from Publisher](#) \*\*\* 61 References Related records
- 6 Enabling High-Throughput Searches for Multiple Chemical Data Using the US-EPA CompTox Chemicals **Dashboard**  
Lowe, CN and Williams, AJ  
Feb 22 2021 | Journal Of Chemical Information And Modeling  
The core goal of cheminformatics is to efficiently store robust and accurate chemical information and make it accessible for drug discovery, environmental analysis, and the development of prediction models including quantitative structure-activity relationships (QSAR). The U.S. Environmental Protection Agency (EPA) has developed a web-based apy ... [Show more](#)  
[View full text](#) \*\*\* 21 References Related records
- 7 The Rhinoplasty Health Care Monitor: Using Validated Questionnaires and a Web-Based Outcome **Dashboard** to Evaluate **Personal** Surgical Performance  
van Zijl, FWJ; Lohuis, PJFM and Datema, FR  
Feb 2021 (Early Access) | Facial Plastic Surgery & Aesthetic Medicine  
Background: Self-assessment provides valuable feedback in the life-long process of mastering rhinoplasty. This study presents a method to measure and evaluate data-based performance of a single surgeon using a web-based **dashboard**. Methods: In this prospective analytic cohort study, all patients referred to the senior author for functio ... [Show more](#)  
[View full text](#) \*\*\* 19 References Related records



# Advanced WoS Query

Clarivate English Products

Web of Science Search Marked List History Alerts Sign In Register

107 results from Social Sciences Citation Index (SSCI), Science Citation Index Expanded (SCI-EXPANDED), Emerging Sources Citation Index (ESCI):

Q (TS=((dashboard\*) NEAR/10 (custom\* OR personal\* OR adapt\* OR flexib\* OR config\* OR driven OR generat\* OR compos\* OR t...)) ANALYZE RESULTS CITATION REPORT CREATE ALERT

Refined by: Open Access X Publication Years: 2021 or 2020 or 2019 or 2018 or 2017 X Document Types: Articles X Clear all

Copy query link

Refine results

Search within results: To...

Quick Filters

- Early Access 1
- Open Access 107

Publication Years

- 2021 10
- 2020 42
- 2019 19
- 2018 22
- 2017 14

Document Types

- Articles 107
- Early Access 1

Web of Science Categories

- Health Care Sciences Services 18
- Medical Informatics 13
- Computer Science Information Systems 12
- Public Environmental Occupational Health 10
- Computer Science Interdisciplinary Applica... 7

See all

Authors

- Theron R 5
- Vazquez-ingelmo A 4
- Garcia-penalvo FJ 3
- Leri D 3
- Azizi MSAM 2

1 of 3

- Learning analytics dashboards for adaptive support in face-to-face collaborative argumentation**  
Han, J; Kim, KH; (...); Cho, YH  
Apr 2021 | Computers & Education  
Despite the potential of learning analytics for personalized learning, it is seldom used to support collaborative learning particularly in face-to-face (F2F) learning contexts. This study uses learning analytics to develop a dashboard system that provides adaptive support for F2F collaborative argumentation (FCA). This study developed two dashb... Show more  
Free Full Text From Publisher \*\*\*  
73 References  
Related records
- Native Grasslands at the Core: A New Paradigm of Intensification for the Campos of Southern South America to Increase Economic and Environmental Sustainability**  
Jaurena, M; Durante, M; (...); Lattanzi, FA  
Mar 5 2021 | Frontiers In Sustainable Food Systems  
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Free Full Text from Publisher \*\*\*  
103 References  
Related records
- Features Constituting Actionable COVID-19 Dashboards: Descriptive Assessment and Expert Appraisal of 158 Public Web-Based COVID-19 Dashboards**  
Ivankovic, D; Barbazza, E; (...); Kringos, D  
Feb 24 2021 | Journal Of Medical Internet Research  
Background: Since the outbreak of COVID-19, the development of dashboards as dynamic, visual tools for communicating COVID-19 data has surged worldwide. Dashboards can inform decision-making and support behavior change. To do so, they must be actionable. The features that constitute an actionable dashboard in the context of the COVID-... Show more  
Free Full Text from Publisher \*\*\*  
61 References  
Related records
- Analysis and Classification of Mobile Apps Using Topic Modeling: A Case Study on Google Play Arabic Apps**  
Fuad, A and Al-Yahya, M  
Feb 16 2021 | Complexity  
Mobile app stores provide an extremely rich source of information on app descriptions, characteristics, and usage, and analyzing these data provides insights and a deeper understanding of the nature of apps. However, manual analysis of this vast amount of information on mobile apps is not a simple and straightforward task; it is costly in terms of human effc... Show more  
Free Full Text from Publisher \*\*\*  
29 References  
Related records
- Staying close to business: the role of epistemic alignment in rendering HR analytics outputs**

# Tools for managing records

- The results of the searches in the databases must be exported from the databases to the tools that have been selected
  - Spreadsheets
  - Bibliographic reference managers

# Bibliographic reference managers

- Although spreadsheets are a tool that facilitates the management of records, at some point in the process (even if only in the final part of the report), bibliographic reference managers are essential
- These tools include features that are invaluable in the review process
  - Direct and selective import of records from databases
  - Indirect import via files with recognized formats (e.g., .ris)
  - Creating folders or libraries to maintain distinct record groups
  - Assigning Tags to Each Reference
  - Integration with major word processors

# Bibliographic reference managers

- Recommendations

## Free license

- **Zotero** (<https://www.zotero.org/>)
- Mendeley (<https://www.mendeley.com/>)

## Paid license

- **EndNote** (<https://endnote.com/>)
- RefWorks (<https://refworks.proquest.com/>)

# Select Primary Studies

- Duplicate records from the different data sources consulted are eliminated
  - The number of duplicates that are removed must be recorded
- The titles and abstracts of the documents that have passed the first filter are reviewed (applying the inclusion and exclusion criteria)
  - The exclusion criterion by which each of the documents that does not pass the filter is discarded should be recorded

# Assessing the quality of primary studies

- The full text of documents that have passed the previous filter is reviewed
- Inclusion and exclusion criteria apply
- The quality of each document is evaluated according to the checklist that has been defined
- Documents that are deleted for not meeting the inclusion criteria must be registered
- Documents that are eliminated for not reaching the minimum quality required must be registered [77]
  - Depending on the assessment score, each article would be included or excluded in the final phase
  - The researcher must set the cut-off point
- Cited documents can be added to your results (as long as they meet the inclusion and exclusion criteria and the quality criteria)
  - The number of documents added in this way must be recorded

# How to read an article

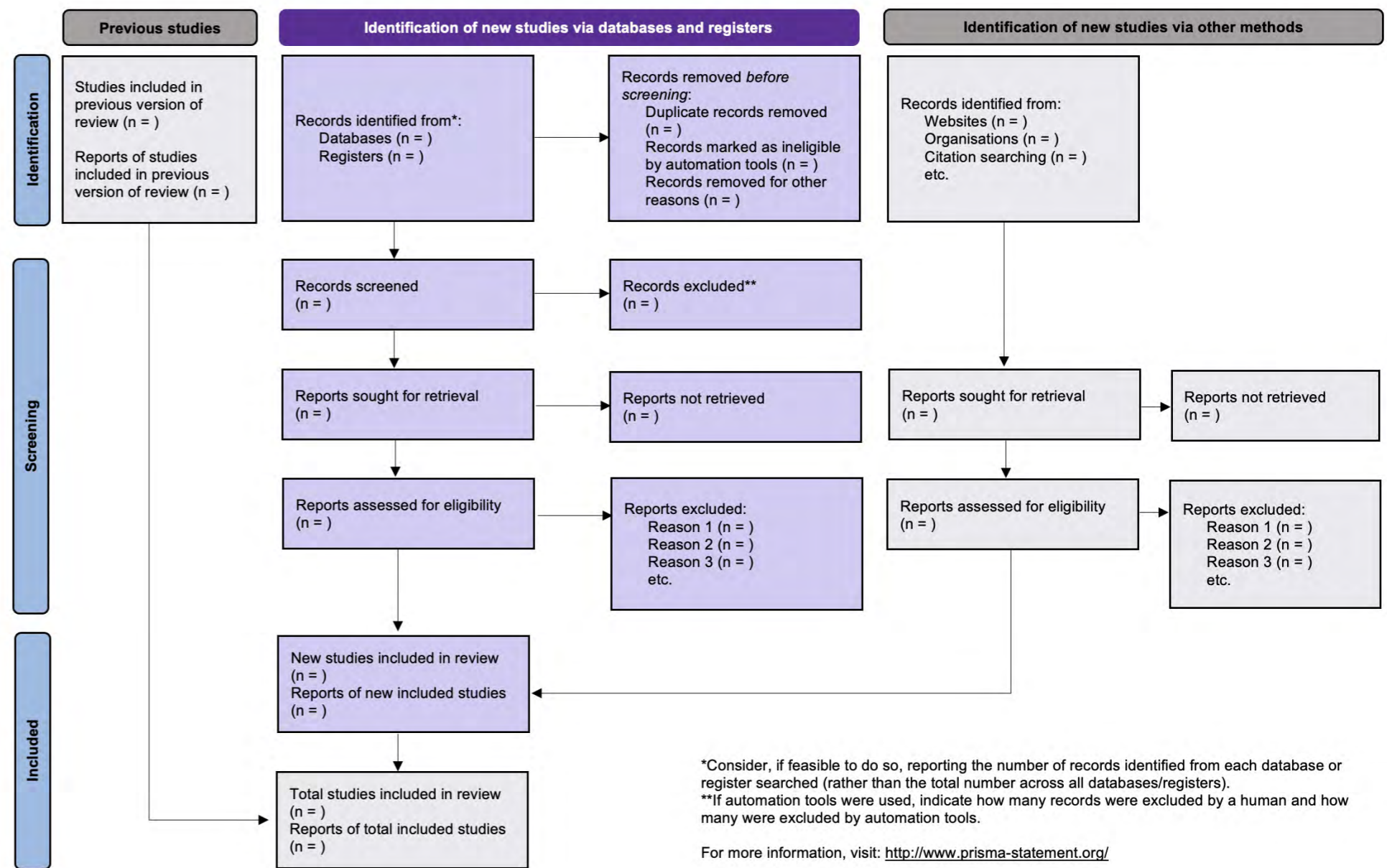
- The three-pass approach can be followed [78]. In each one, it is decided whether to continue reading
  - First pass – Gives an overview
    - Read the title, summary, and introduction in detail
    - Identify the internal structure of the article (sections and subsections) and ignore the rest
    - Read the findings
    - Look at the references and make a mental note of those you already know, expect, etc.
  - Second pass – Allows you to capture the content of the document, but not its details
    - Look carefully at figures, graphs
    - Mark references that are not known
  - Third pass – Allows you to understand the article in depth
    - Reading the full text, seeking to understand the key elements

# Adding new records

- An in-depth reading of the selected documents may lead to their discarding, but new documents that are of interest to the review study can also be identified
- If these new candidates are selected for inclusion in the final corpus (they must meet all inclusion/exclusion and quality criteria, as well as the records identified in the search strategy), they have to be reflected in the review flowchart
- The selection of these new sources usually arises from the review of the references included in the selected works after applying the search strategy, but there are tools to discover related works for those cases in which the number of positive records does not meet the expectations of the authors of the review
  - For example, ResearchRabbit (<https://www.researchrabbit.ai/>), Litmaps (<https://www.litmaps.com/>) or Iris (<https://iris.ai/>)
- There are also tools based on Generative Artificial Intelligence [79, 80] to receive suggestions on the bibliography of a topic, such as Scite Assistant (<https://scite.ai/assistant>) or Consensus (<https://consensus.app/>), that can serve as seeds for the previous tools

# Document the review flow

It is recommended to use a PRISMA flowchart [56, 57], although there are other possibilities



# Inter-judge consensus and agreement calculation

- Also known as independent dual screening / inter-rater agreement / conflict resolution by consensus
- Principles of screening



## Blind process

Two review authors evaluate the same articles without knowing the other's decision to avoid bias



## Duplicity

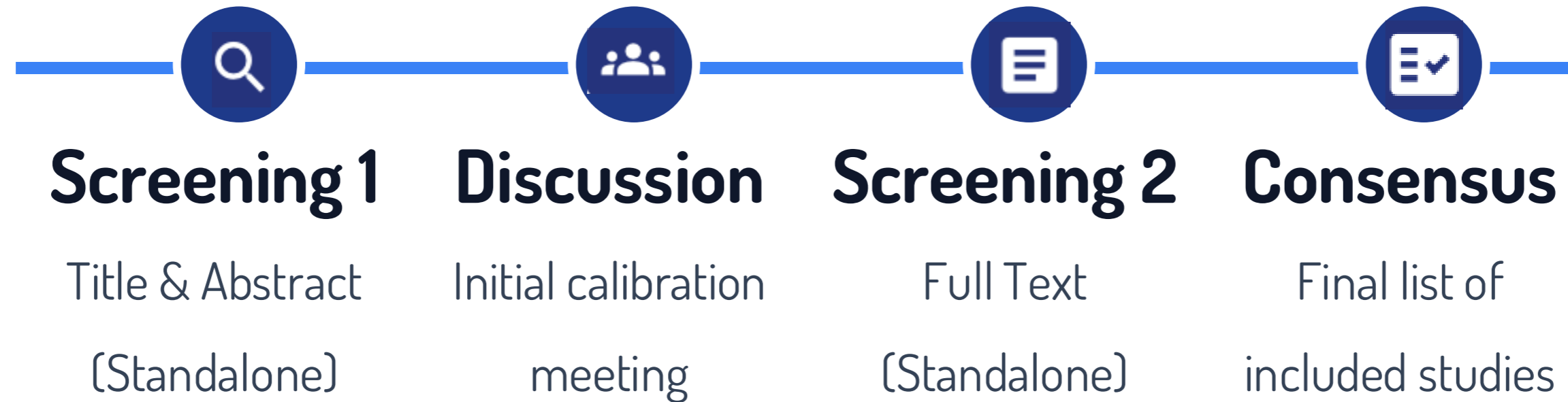
The standard requires that each record be processed in duplicate in isolation



## Arbitration

A third review author acts as a mediator in case initial consensus is not reached

# Consensus protocol flow



# Roles and rules before you start

Consensus must be protocolized, not improvised



# The role of senior refereeing

- **Mediation of discrepancies**
  - When the dialogue between the two lead reviewers reaches an impasse, the arbitration protocol is activated
    - **Expert judgment:** A senior researcher assesses the reasons on both sides
    - **Protocol reference:** It is reviewed if the PICOC criteria were misinterpreted
    - **Final decision:** The arbitrator dictates the final inclusion or exclusion

# Basic selection protocol example

Minimum template that can be included in the SLR method

Element	Protocolized decision
Reviewers	Two independent reviewers: R1 and R2
Unity of decision	Each record retrieved after deleting duplicates
Phase 1	Title and abstract screening: include/exclude/dubious
Phase 2	Full-text evaluation for potentially eligible records
Disagreements	Discussion between R1 and R2; if persists, third reviewer
Metrics	Cohen's Kappa on the initial include/exclude decision

**Note:** The protocol must be defined before starting screening to avoid retrospective decisions

# Kappa de Cohen

In science, the percentage of simple agreement is not enough because it ignores the probability of matching by pure chance

Kappa measures the degree to which the observed deal exceeds the expected deal if both reviewers were to choose the options by flipping a coin

It is the standard indicator for reporting inter-judge reliability in JCR/Scopus publications



# How to code decisions

**The quality of Kappa depends on clear and mutually exclusive categories**

**Include**  
Meets criteria or needs to be revised to full text

**Exclude**  
It does not meet criteria in an obvious way

**Doubtful**  
Insufficient information

**For a simple example of Cohen's Kappa, the final initial screening decision will be made in two categories**

**Accepted in screening**

**Excluded from screening**



# Cohen's Kappa – Mathematical definition

$$K = \frac{p_o - p_e}{1 - p_e}$$

$p_o$  is the observed agreement

Sum of actual matches divided by total cases

$p_e$  is the agreement by chance

Combined probability of randomly matching based on each reviewer's totals

## General interpretation

$\kappa = 1$  perfect agreement

$\kappa = 0$  agreement equivalent to chance

$\kappa < 0$  worse than chance

# Case study

100

EVALUATED ARTICLES

## Applied Protocol

100 titles/abstracts are evaluated for eligibility for a systematic review on telemedicine once duplicates have been eliminated

**Reviewers:** Two independent researchers

**Categories:** Eligible (Yes) / Not eligible (No)

**Objective:** Calculate Kappa before consensus

# Case study

## 2x2 decision matrix

	Reviewer B includes	Reviewer B excludes	Total A
Reviewer A includes	24	6	30
Reviewer A excludes	4	66	70
Total B	28	72	100

- Reviewer A includes 30 and excludes 70, for a total 100
- Reviewer B includes 28 and excludes 72, for a total 100
- The cells on the main diagonal represent the matches (24 included by both, 66 excluded by both)
- The cells outside the main diagonal represent the conflicts that will later be resolved by consensus (reviewer A includes 6 that reviewer B excludes; reviewer A excludes 4 that reviewer B includes), i.e., there are 10 records that require discussion and consensus

	Reviewer B includes	Reviewer B excludes	Total A
Reviewer A includes	24	6	30
Reviewer A excludes	4	66	70
Total B	28	72	100

Agreements observed  
24 + 66 = 90

	Reviewer B includes	Reviewer B excludes	Total A
Reviewer A includes	24	6	30
Reviewer A excludes	4	66	70
Total B	28	72	100

Disagreements  
6 + 4 = 10

# Case study

## Step-by-step calculation of Cohen's Kappa

### Agreement observed

$$p_o = \frac{(24 + 55)}{100} = \frac{90}{100} = 0.90$$

### Expected agreement

$$\text{Probability that A will randomly choose "yes"} = \frac{30 \times 100}{100} = 30\% = 0.3$$

$$\text{Probability that A will choose non – randomly} = \frac{70 \times 100}{100} = 70\% = 0.7$$

$$\text{Probability that B will randomly choose "yes"} = \frac{28 \times 100}{100} = 28\% = 0.28$$

$$\text{Probability that B will choose non – randomly} = \frac{72 \times 100}{100} = 72\% = 0.72$$

$$\text{Probability that both will choose "yes" at random} = 0.3 \times 0.28 = 0.084$$

$$\begin{aligned} \text{Probability that both will make a non – random choice} &= 0.7 \times 0.72 \\ &= 0.504 \end{aligned}$$

$$p_e = (0.084 + 0.504) = 0.584$$

# Case study

## Cohen's Kappa

$$K = \frac{p_o - p_e}{1 - p_e} = \frac{0.9 - 0.588}{1 - 0.588} = \frac{0.312}{0.412} = 0.757$$

### Practical interpretation

**El Reviewer agreement is substantial/high, though not perfect. There are 10 records that require discussion and consensus**

# Interpretation scale (Landis and Koch scale)

Value of Kappa (K)	Degree of Agreement	Is it acceptable for a systematic review?
< 0.00	No agreement (worse than chance)	✘ Unacceptable
0.01 – 0.20	Levers / Insignificant	✘ Unacceptable
0.21 – 0.40	Acceptable / Fair	⚠ Very low (requires recalibration of criteria)
0.41 – 0.60	Moderate	⚠ Acceptable, but can be improved
0.61 – 0.80	<b>Substantial</b>	<b>Ideal / Recommended for an SLR</b>
0.81 – 1.00	<b>Almost perfect</b>	<b>Excellent</b>

## Care

The cut-off points are indicative, not a universal rule. A low Kappa can appear if a category is very rare, even with a high percentage of agreement

## Recommendation

Report  $\kappa$  along with the contingency matrix, agreement percentage, and dispute resolution procedure

# Case study

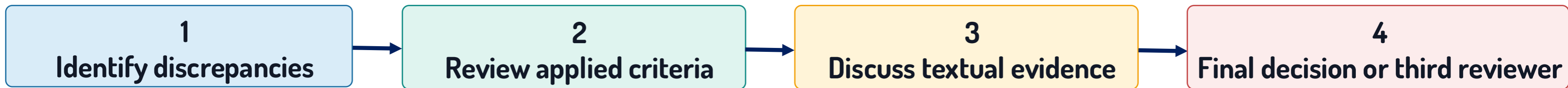
## Model writing for the methods section of an article

### Suggested text

Study selection was made by two independent reviewers. In the first phase, titles and abstracts were screened according to the previously defined inclusion and exclusion criteria. The degree of interevaluator agreement was calculated using Cohen's Kappa coefficient. Discrepancies were resolved through discussion and, where agreement was not reached, through the intervention of a third reviewer. The selection process and the reasons for exclusion, in their full text, were documented following the PRISMA 2020 guidelines

# Resolution of discrepancies by consensus

## What to do about conflicts after measuring the initial agreement?



### Best practices

- Maintaining traceability: who decided what and why
- Do not recalculate the Kappa after consensus, as if it were an independent agreement.
- Record the causes of exclusion in full text
- Update the screening manual if recurring ambiguity is detected

# Extract the relevant data

- Relevant data must be extracted from each selected article
  - The objective is to carry out a systematized analysis, which implies applying the same scheme to each of the selected documents
    - For example, by creating an individual file that reflects the analysis schema and makes it easier to translate that information into tables or graphs in the final report
  - The elements that make up the analysis scheme must be adjusted to the objectives of the study
  - For the metadata of the article, it is recommended to use a bibliographic reference manager
  - Data on content related to research questions
    - In this stage of data extraction, the specific elements to be collected vary for each job, and it is necessary to be guided by the research questions and objectives

# Example of an analysis schema [81]

1	<b>Full source reference</b>	Source metadata (author, title, etc.)
2	<b>Summary</b>	It must include the object of study, methodology and main results obtained. Recommended length over 300 words
3	<b>Type of research / Data collection methods</b>	Type of research (qualitative, quantitative, theoretical, applied, case study, etc.) and methods of data collection
4	<b>Main contributions</b>	In relation to: terminology, models, concepts, experimental design, results, etc.
5	<b>Value, originality or more relevant aspects</b>	The aspects that give the greatest value to the work are identified: rigor, writing, data, etc.
6	<b>Comments and evaluation synthesis</b>	Additional notes and comments of an evaluative or critical nature
7	<b>Keywords</b>	Terms that help categorize the document being analyzed

# Extract quantitative data

- This process allows the reviewer to examine which elements of the data are present in each individual study report
- Without formal tools to extract and summarize results, one must rely on an extraordinary ability to mentally juggle relationships between many variables. A systematic way of exploring these relationships makes it easier to detect and understand them [82]
- Data extraction can be performed at the same time as the quality assessment or separately, before or after the overall quality assessment [83]

# Possible elements to include in a data extraction form [69]

- **Eligibility:** explicit statement of inclusion and exclusion criteria, with the opportunity to indicate whether a study should be included in the review or not
- **Descriptive data:** information on the characteristics of the study, including the setting and population
- **Quality assessment data:** information about study quality. Documentation may include a formal checklist
- **Results:** information about the results of the study in the form of data to be used in the review. The data can be in a "raw" format, taken directly from the document, and/or in a uniform format. Ideally, they should be in both forms to indicate the variation of methods, but also to be able to check their accuracy

# Traceability

- Full explanations must be provided on how the process has been carried out
- The documents reviewed should be included in each phase, the inclusion/exclusion criteria to be used to select/reject the documents in the systematic review should be specified
- If these explanations are not provided, whoever reviews an article or who supervises a thesis, for example, will not be able to rely on research
- Most of this information cannot be included in an academic article or document
  - Too much extension and eye strain (in the case of very large boards)

# Solutions to ensure traceability

- Use Google Sheets
  - <https://docs.google.com/spreadsheets/d/169RCtU7Q4Qq1eryq1d6c1XnMzDEhgyptYqZh1C8eaYA/edit#gid=0>
- Use websites
  - <https://sites.google.com/site/francilaneiva/research/pragmatic-interopability-a-systematic-mapping>
- Git repositories
  - <https://github.com/cbjuan/slr-softwareArchitectures-HCI-HMI>
- Use data repositories
  - <https://zenodo.org/>
- Use tools
  - Parsifal <https://parsif.al/>

# Traceability. Example [35]

After the search, the selection of papers to be used for the literature review was performed following these steps:

1. All the raw-results were collected in a GIT repository ([Cruz-Benito, 2017](#)) and a spreadsheet (<https://goo.gl/QK5Qrd>), removing all the duplicates across the databases.
2. The resultant papers were analyzed based on the title and abstract and the inclusion/exclusion criteria. In those cases where the title and abstract were not sufficient to decide, the authors quickly assessed the entire content of the paper. The resultant candidate papers were added to another sheet of the spreadsheet document (<https://goo.gl/4xweXc>).
3. The papers were read in detail and analyzed following the previously-posed research questions. The selected papers passed a quality assessment checklist (see [Table 1](#)), and the information was collected in another spreadsheet (<https://goo.gl/cYBfyp>). Besides the papers selected in this manner, the authors also considered papers collected within the references of those that potentially could be interesting for the review process. It raised another three papers to be included in the review.



## 6. Reporting phase

# Synthesize the extracted data [69]

- There are several options that lead to synthesis
- The approach stems from the nature of the review and its objectives

Type of review	Approaches used to synthesis	Application
Scoping review	Coding Narrative synthesis Tabular presentation	Descriptive coding was applied to include study features such as design, country of origin, type of behaviour targeted, characteristics of population and type of incentive used. Outcome studies were coded in greater depth. Paragraphs described the features of studies for each variable (e.g. types of intervention and incentive). Tables complemented narrative synthesis with frequencies and percentages of each type.
Mapping review	Keywording Mapping studies not synthesised because they were 'disparate in their focus'	EPPI-Centre core keywording strategy used to classify studies according to a range of criteria, including bibliographic details (how the study was identified and whether it has been published), and contextual details (the language in which the study was written/published and the country where the study was conducted). Key aspects of the study also coded, such as topic focus of study, and information about the subjects of the study. Mapping stage of review describes studies found to be relevant, gives overview of the field of study, and enables reviewers to focus on particular areas of map. Brief commentary given on each study with emphasis on conclusions not methods.
Meta-analysis	Data extraction Translation into common metrics Computation of missing values	Extracted data in a standardised way: weights in pounds (lbs) transformed into kilograms (kg) and weeks transformed into months. Attempted contact with authors to obtain missing information. Assessed each study using a modified version of the Ottawa-Newcastle Scale.
Systematic review	Categorisation Data extraction Quality assessment Narrative synthesis Tabular presentation Meta-analysis not possible because of variability of studies.	Articles categorised by type of publication. Data from intervention studies included study design, sample and intervention characteristics, and data collection methods and measures. Studies assessed using checklist. Narrative description and tabulation of study features and of methodological adequacy.

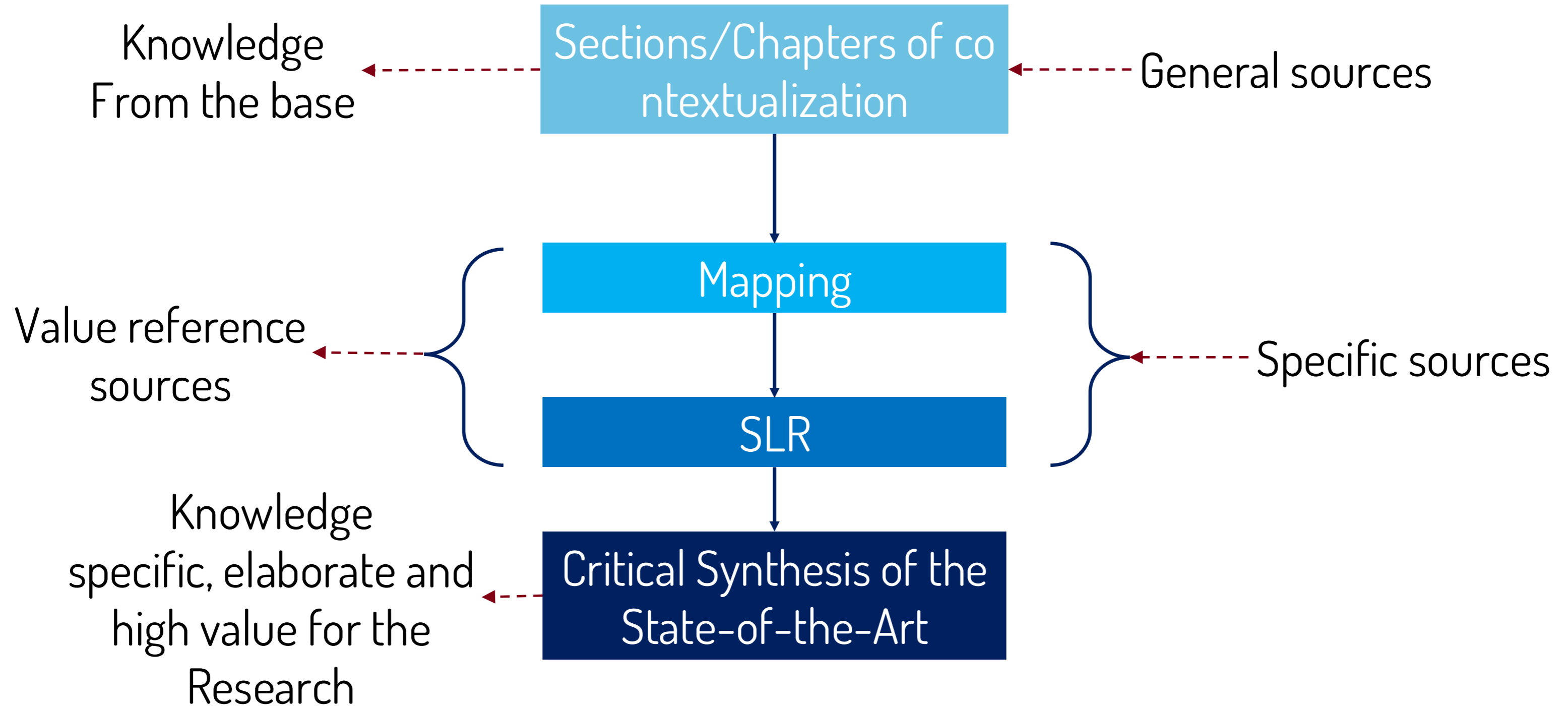
# Write the review report

- The writing of the systematic review report should include the description and presentation of the methods followed, as well as the results obtained from the selected literature
- This phase can consist of two steps [84]
  - Detailed Description
  - Public presentation in academic article format
- Therefore, it will depend on the type of document in which the results are going to be presented

# How to guide the writing of the report

- In an academic document, you can have a section contextualizing the state of the art based on the most fundamental texts, a mapping section, a systematic review section, and a section discussing the results obtained as answers to research questions
- When focusing on a scientific article, the complete systematic review is usually very difficult to incorporate in its entirety (unless it is very specific and small in size), for reasons of length, and those parts that are most appropriate for the objective of the article will have to be selected
- Mappings and SLRs can also be done independently, which would result in different jobs that are more focused on specific goals and are usually of greater interest for journals and conferences
- Graphs, tables, and visual explanations should be used, but there should always be a section for discussion of the results, where the contributions of the systematic study are valued

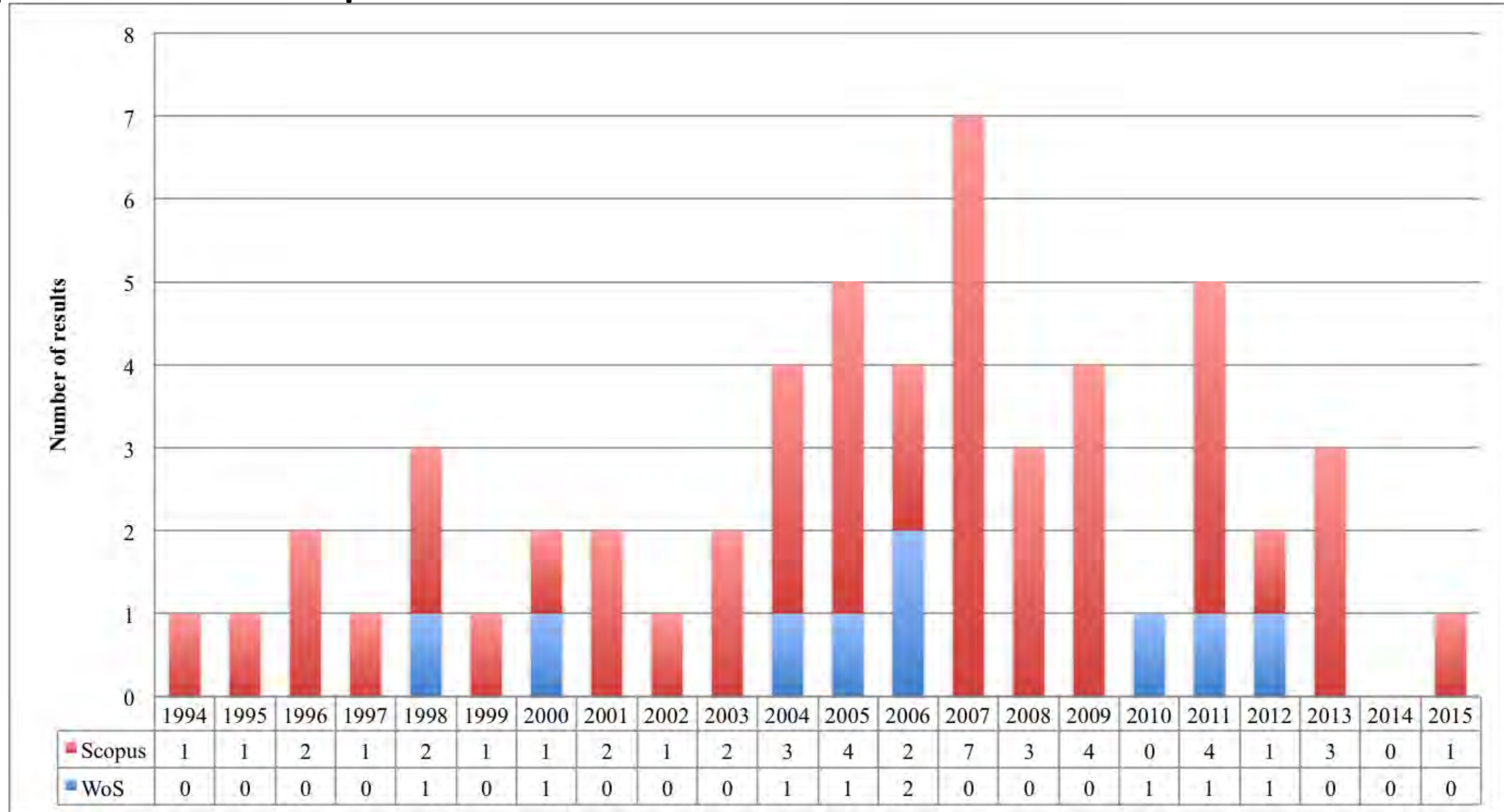
# Structure of the State-of-the-Art section in an academic work



# Graphics

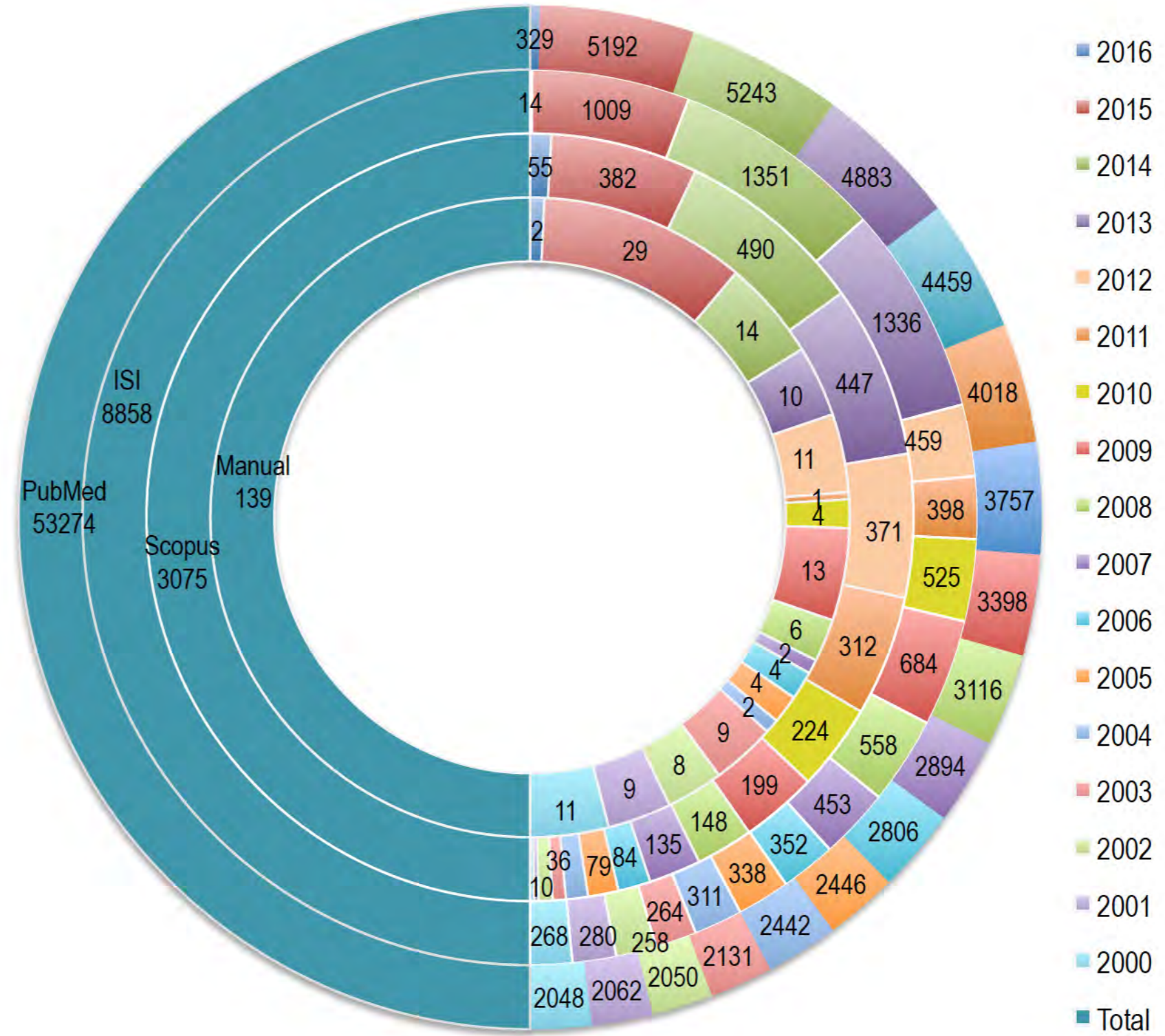
- Graphical approaches can make an important contribution to synthesis by helping to identify patterns
- They have a special role in helping to visualize the relationship of the parts to the whole
- They can also be used to establish links between different characteristics of a review, for example, to represent a link between the characteristics of the study and the results
- Creativity and critical analysis of data and its visualization are key elements for data comparison and the identification of important and accurate patterns and themes [85]
- This category includes graphical representations of data, concept maps, logic models, geographic maps, etc.

# Graphics. Example [65]



# Graphics. Example [86]

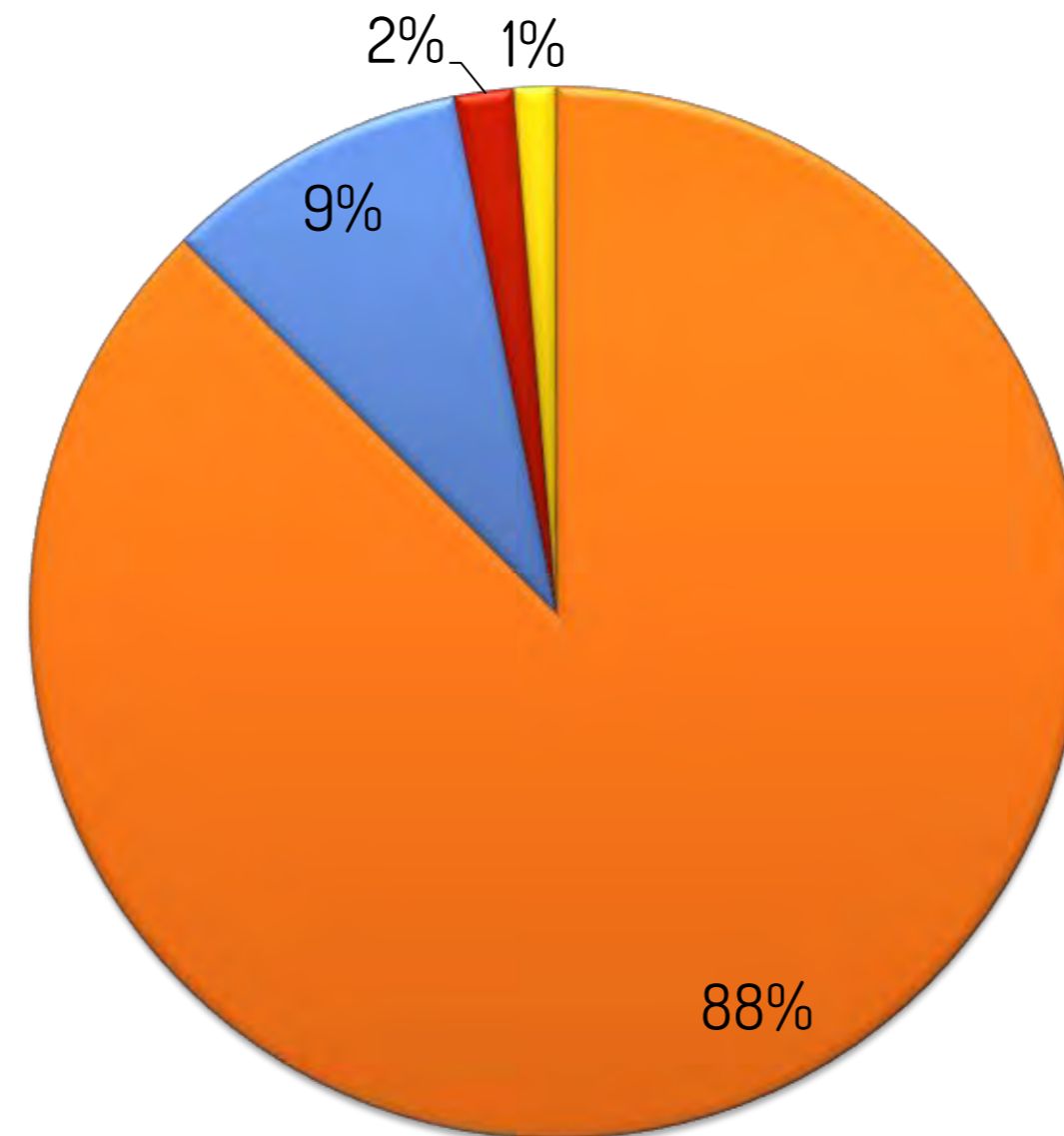
Complete result in database extraction



# Graphics. Example [87]

## Tipología de la literatura

■ Journal article  
 ■ Conference  
 ■ Book Chapter  
 ■ Other



# Graphics. Example [88]



# Tables

- In addition to narrative synthesis, studies can be described by tables
- Tables are probably the most useful and most general way of organizing and representing knowledge
- Because tables are used to describe studies, not to analyze them, it is useful for all types of studies
- Tables can be used to describe the characteristics of the population, the intervention, the comparator, and outcome (measures), the characteristics of the study (e.g., study design)

# Tables. Example [35]

Summary of review findings on the main interfaces/systems presented in HCI papers.

Reference	Graphical User Interface	Laser Pointer	Touch display/ interface	Camera	Microphone	BCIs (Brain-Computer interface)	Motion tracking sensors	Mouse, Keyboard & Joystick	Force pressure sensors & Haptics	Smartphone/mobile devices/tablet	Gaze trackers	Wearables
Vega-Barbas et al. (2015)							X					
Chaczko et al. (2015)				X			X		X			
Mackin et al. (2012)			X	X								
Biel et al. (2010)										X		
Jacquet et al. (2009)	X		X	X	X		X			X		
Dimakis et al. (2009)	X			X	X		X					
Seffah et al. (2008)	X											
Capilla et al. (2014)	X									X		
Tiefenbacher et al. (2014)	X		X									
Calandra et al. (2013)	X		X		X						X	
Caruso et al. (2013)	X		X			X				X		
Pittarello (2011)	X									X		
Folmer and Bosch (2008)												
Jacquet et al. (2007)				X								
Marsic and Dorohonceanu (2003)	X			X	X			X		X	X	X
Nigay and Coutaz (1995)	X							X				
Bass et al. (2001)												
Jalaliniya et al. (2015)										X	X	X
Wang and Canedo (2014)	X									X		
König et al. (2010)	X	X			X					X		
Olmedo et al. (2015)	X				X			X				
de Alencar et al. (2014)										X		
Rego et al. (2014)				X	X	X	X	X	X			
Malandrino et al. (2010)										X		
Bongartz et al. (2012)	X				X		X			X		X
Sutcliffe et al. (2011)	X											

# Tables. Example [89]

**TABLE 1** Studies classification by topic about the application of PD&R in STEAM

Topic	References	No. of papers
1: Studies focused on describing the application of PD&R in STEAM Education	[11,36,49,79,81,84,104,112]	8
2: Studies devoted to describing the application of PD&R as a way to foster STEAM disciplines	[11,12,20,30,35–37,44,48,52,57,61,64,65,70,73,74,76,78,103,104,107,111]	23
3: Studies focused on the development of certain competencies in the context of STEAM Education	[14,16,22,31,42,44,51,57,58,63,70,76,86,92,105,107,109]	17
4: Studies that describe the application of different tools and techniques in STEAM Education	[10,20,21,24,26,30,38,52,56,58,66,85–87,90,93,96,97,102]	19

Abbreviations: PD&R, physical devices and robotics; STEAM, science, technology, engineering, arts, and mathematics.

# Tables. Example [89]



**TABLE 2** Distribution of selected studies for MQ2, MQ3, MQ4, and MQ5

Description	References	No. of studies
Section A—Associated benefits		
Technology	[21,35,51,52,61,76,78,79,81,85–87,93,97,109]	15
Methodologies	[10,11,20,21,24,26,30,31,37,38,44,48,49,51,61,64,65,73,74,76,81,85,87,90,93,104,109,111,112]	29
Competencies acquisition	[14,16,20,22,30,31,42,57,58,63,64,66,70,84,92,96,97,102]	18
Application Contexts	[12,36,42,48,58,70,79,81,84,85,87,103,105]	13
Section B—Tool employed		
Robotics	[12,16,24,31,35–37,48,49,52,56–58,61,63,70,73,76,78,81,84,86,87,93,97,103,109,112]	28
Physical devices	[10,14,21,38,42,44,51,65,74,90,92,96,102,107]	14
Both	[11,20,22,26,30,64,66,79,85,104,105,111]	12
Section C—Methodology		
PBL	[11,14,42,48,51,52,57,76,79,92,93,105,107,112]	14
PrBL	[10,11,22,24,30,31,35,36,38,44,56,58,61,64,65,73,74,78,81,84,85,87,90,102,103,107,109,111,112]	29
ChBL	[16,20,21,26,37,49,70,96,97]	9
Other	[12,66,86]	3
Section D—Educational level		
Elementary school	[57,81,86,93]	4
Middle school	[11,12,16,20,21,24,26,30,31,42,48,49,51,52,57,65,66,78,79,81,85,90,92,96,97,103,104,107,109,112]	30
High school	[10,44,52,58,61,79,81,84]	8
Higher education	[35,36,38,56,63,64,70,73,74,76]	10
Not specified	[14,22,37,87,102,105,111]	7

Abbreviations: ChBL, challenge-based learning; MP, mapping question; PBL, problem-based learning; PrBL, problem-based learning.

# Literature review matrices

- They are the table-based tools that can be used to analyze and synthesize the records of the systematic review corpus
- A literature review matrix is a table where the rows are the references or documents that make up the corpus, and the columns are the variables to be analyzed for each reference [90]
- The matrix is a class of table that has some constraints [91]
  - The structure of the table must be homogeneous
  - Rows must represent well-identified unique entities (row rule)
  - Columns must represent properties of entities
  - Additionally, it is useful for rows to have some kind of unique identifier, even if it is a simple number

# Literature review matrices

- The columns (variables) can be determined by various strategies
  - **Axes** to characterize the research. It is about obtaining data on variables common to all research, such as objectives, methodology, conceptual framework, main results, etc.
  - **Topics** that have been addressed in the investigations. They are specific to each project and determine the study variables. The topics or variables can be determined a priori, that is, they can be of deductive origin (by prior knowledge of the subject), or they can be obtained inductively, from the review of the documents
- In all cases, the variables in the columns provide the questions with which the documents are analyzed
- The order of the rows should be chronological in ascending order [90] (first the oldest to observe the evolution of the items analyzed)

# Literature review matrices

- Benefits [91]
  - Each reference is treated equally
  - The table's own structure facilitates comparisons, as well as identifying emerging patterns and themes

# Axis-based matrix. General outline [91]

<i>ID</i>	<i>Reference</i>	<i>Axis 1</i>	<i>Axis 2</i>	<i>Axis 3</i>

In [89] it is recommended to separate the reference information into two columns, one for the source data and the other for the year of publication

# Axis-based matrix. Example [91]

The three axes or elements of analysis chosen and the questions they generate are

- **Methods:** What methods have been used in each research?
- **Main problem:** What is the main approach or problem handled?
- **Main outcomes:** What are the main results obtained?

<i>ID</i>	<i>Reference</i>	<i>Methods</i>	<i>Main problem</i>	<i>Main outcomes</i>
-----------	------------------	----------------	---------------------	----------------------

# Matrix based on themes or codes

- In the analysis, an answer is sought to how each research treats a specific topic or code
- For example, in a review of Artificial Intelligence applied to journalism, these topics could be used [91]
  - **Ethics:** What aspects of the ethical dimension does each research include?
  - **Perception:** How different actors – experts, journalists, readers, companies, etc. – perceive the entry of AI into journalism?
  - **Countries:** Which countries are affected by each study?

<i>ID</i>	<i>Reference</i>	<i>Ethics</i>	<i>Perception</i>	<i>Countries</i>
-----------	------------------	---------------	-------------------	------------------

# Presence/absence matrix [91]

- They aim to detect the presence or absence of a set of predefined indicators or items
- The columns represent the list of items, and the rows represent the records

<b>ID</b>	<b>Ref.</b>	<b>Item1</b>	<b>Item2</b>	<b>Item3</b>	<b>Item4</b>	<b>Item5</b>	<b>Item6</b>
01	Reference 1	+	-	+	-	+	+
02	Reference 2	-	+	+	+	+	+
03	Reference 3	+	-	-	-	+	+
...							
N	Reference N	+	-	-	+	-	+

# Matrices as a synthesis tool

- The matrices are a powerful tool for analysis, but also for synthesis [91]
  - The tables that form the matrices, with or without additional processing, act as a direct synthesis. More so if, after extracting data and representing it in tables, you see the opportunity to create new tables by means of operations that isolate certain rows or by creating new tables that combine rows and columns, so that they highlight patterns or trends
  - By applying the rule of columns [91], that is, by examining each column independently, valuable information can be obtained for narrative synthesis: how an item evolves, whether there are repetitions, absences, similarities, oppositions, patterns, or trends

## 7. Case study

# Statement

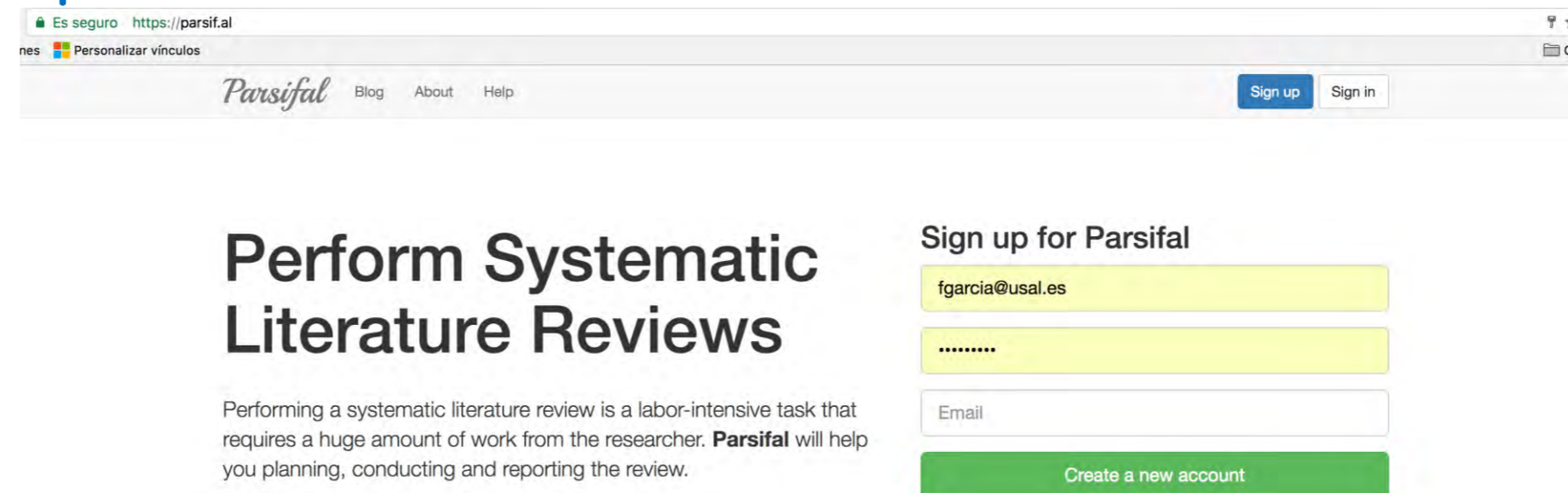
- The Research and Innovation in Education Group of Tecnológico de Monterrey (<http://sitios.itesm.mx/ehe/iie/>) wishes to study the trends in its line of research in the development and use of technology in education
- The development of this case study resulted in the publication of this book [92]

# Approach

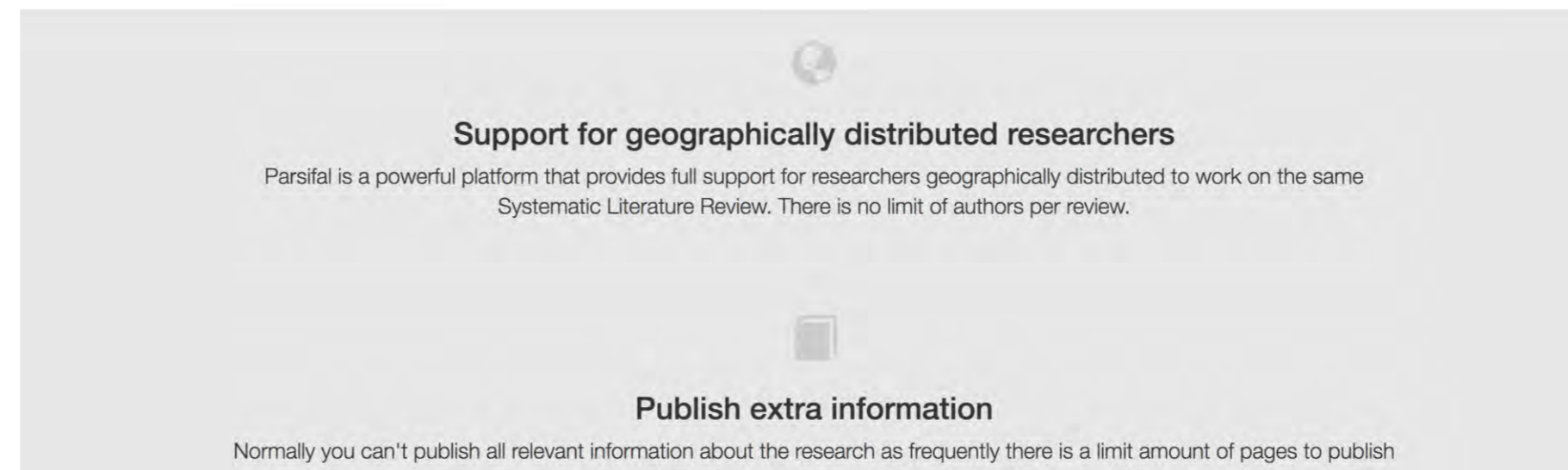
- It will be focused like a mapping, but without being part of an SLR
- It is a very broad line, it will have to be delimited
  - Temporarily: 2015–Present
  - Databases
    - Scopus
    - WoS core collection
  - Language
    - Searches with English terms only
    - Articles in Spanish or English will be accepted
  - Document Type
    - Journal articles only

# Approach

- It will be shown how to start the process, using the Parsifal tool as a support <https://parsif.al/>



The screenshot shows the Parsifal website interface. At the top, there is a navigation bar with the Parsifal logo, links for 'Blog', 'About', and 'Help', and buttons for 'Sign up' and 'Sign in'. The main content area features a large heading 'Perform Systematic Literature Reviews' and a sub-heading 'Sign up for Parsifal'. Below the heading, there is a paragraph explaining that performing a systematic literature review is labor-intensive and that Parsifal helps with planning, conducting, and reporting. To the right, there is a sign-up form with three input fields: the first contains 'fgarcia@usal.es', the second contains '.....', and the third is labeled 'Email'. A green button labeled 'Create a new account' is positioned below the form.



The screenshot shows a section of the Parsifal website with a heading 'Support for geographically distributed researchers'. Below the heading, there is a paragraph stating: 'Parsifal is a powerful platform that provides full support for researchers geographically distributed to work on the same Systematic Literature Review. There is no limit of authors per review.' Below this text, there is a heading 'Publish extra information' and a paragraph starting with 'Normally you can't publish all relevant information about the research as frequently there is a limit amount of pages to publish'.



# Definition of the system and establishment of the work team

*Parsifal* Blog About Help fgarcia04 | ⚙️ ↻

fgarcia04 / **Desarrollo y uso de la tecnología en educación** [Review settings](#)

**Review** Planning Conducting Reporting

**Review details**

**Title**  
Desarrollo y uso de la tecnología en educación

**Description**  
Para el capítulo del GIIE, Tecnológico de Monterrey, México, Noviembre de 2017

[Save](#)

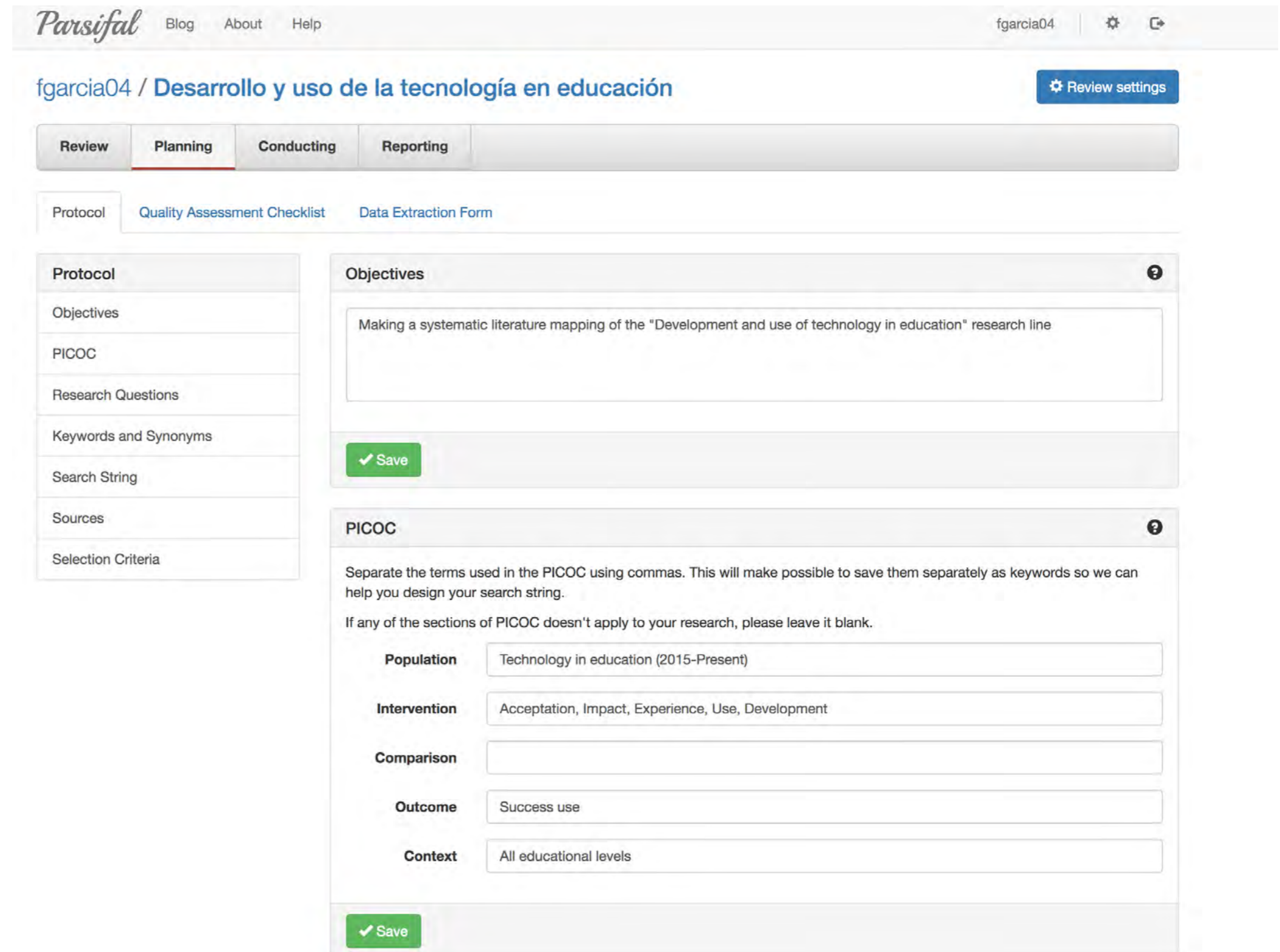
**Authors**

fgarcia04	main author
lauraicela25	✖
cangeles	✖

[+ Add author](#)

# Definition of the protocol

- The objective is defined of the action and the PICOC



*Parsifal* Blog About Help fgarci04 | ⚙️ 🔄

fgarci04 / [Desarrollo y uso de la tecnología en educación](#) [Review settings](#)

Review **Planning** Conducting Reporting

Protocol [Quality Assessment Checklist](#) [Data Extraction Form](#)

**Protocol**

- Objectives
- PICOC
- Research Questions
- Keywords and Synonyms
- Search String
- Sources
- Selection Criteria

**Objectives** ⓘ

Making a systematic literature mapping of the "Development and use of technology in education" research line

✓ Save

**PICOC** ⓘ

Separate the terms used in the PICOC using commas. This will make possible to save them separately as keywords so we can help you design your search string.

If any of the sections of PICOC doesn't apply to your research, please leave it blank.

**Population** Technology in education (2015-Present)

**Intervention** Acceptation, Impact, Experience, Use, Development

**Comparison**

**Outcome** Success use

**Context** All educational levels

✓ Save

# Definition of the protocol

- Research questions

Research Questions ?

<span style="color: #007bff;">^</span> <span style="color: #007bff;">v</span>	Which is the geographical distribution of the authors?	<span style="background-color: #ffc107; padding: 2px 5px; border: 1px solid #ffc107;">✎ edit</span> <span style="background-color: #dc3545; padding: 2px 5px; border: 1px solid #dc3545; margin-left: 5px;">🗑 remove</span>
<span style="color: #007bff;">^</span> <span style="color: #007bff;">v</span>	Which are the most important authors?	<span style="background-color: #ffc107; padding: 2px 5px; border: 1px solid #ffc107;">✎ edit</span> <span style="background-color: #dc3545; padding: 2px 5px; border: 1px solid #dc3545; margin-left: 5px;">🗑 remove</span>
<span style="color: #007bff;">^</span> <span style="color: #007bff;">v</span>	Which is the topics list in this research line?	<span style="background-color: #ffc107; padding: 2px 5px; border: 1px solid #ffc107;">✎ edit</span> <span style="background-color: #dc3545; padding: 2px 5px; border: 1px solid #dc3545; margin-left: 5px;">🗑 remove</span>
<span style="color: #007bff;">^</span> <span style="color: #007bff;">v</span>	Which are the affected educational levels?	<span style="background-color: #ffc107; padding: 2px 5px; border: 1px solid #ffc107;">✎ edit</span> <span style="background-color: #dc3545; padding: 2px 5px; border: 1px solid #dc3545; margin-left: 5px;">🗑 remove</span>
<span style="color: #007bff;">^</span> <span style="color: #007bff;">v</span>	How the discovered topics list is mapped with the current descriptors of the research line?	<span style="background-color: #ffc107; padding: 2px 5px; border: 1px solid #ffc107;">✎ edit</span> <span style="background-color: #dc3545; padding: 2px 5px; border: 1px solid #dc3545; margin-left: 5px;">🗑 remove</span>

+ Add Question

# Definition of the protocol

- The next step is to define the key terms, related to the PICOC fields

Keywords and Synonyms <span style="float: right;">?</span>		
To edit or remove a certain keyword or synonym you may click on it's description to enable the field.		
Keyword	Synonyms	Related to
Acceptation		Intervention <span style="float: right;">edit remove</span>
Development		Intervention <span style="float: right;">edit remove</span>
Educational technol*		Population <span style="float: right;">edit remove</span>
Experience		Intervention <span style="float: right;">edit remove</span>
Impact		Intervention <span style="float: right;">edit remove</span>
Innovat*		Population <span style="float: right;">edit remove</span>
Learning techno*		Population <span style="float: right;">edit remove</span>
Use		Intervention <span style="float: right;">edit remove</span>

+ Add Keyword
📄 Import PICO Keywods

# Definition of the protocol

- The question arises as to what the canonical search equation

Search String
?


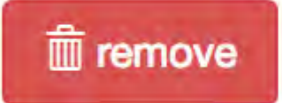

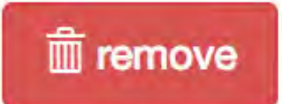
**i** Use uppercase for boolean operators (**AND**, **OR**), double quotes for composite words and parentheses to logically separate the keywords and synonyms.



```
(("Educational technol*" OR "Learning techno*") AND ("innovat*")) AND ("Acceptation" OR "Development" OR "Experience" OR "Impact" OR "Use")
```

✓ Save
Suggested Search String

# Definition of the protocol

- The data sources from which to extract the studies are chosen

Sources		
Name	URL	
ISI Web of Science	<a href="http://www.isiknowledge.com">http://www.isiknowledge.com</a>	 edit  remove
Scopus	<a href="http://www.scopus.com">http://www.scopus.com</a>	 edit  remove

# Definition of the protocol

- Inclusion and exclusion criteria are defined

**Selection Criteria**

Inform your inclusion or exclusion criteria and press **Enter** to add.

<p><b>Inclusion Criteria</b></p> <div style="border: 1px solid #ccc; height: 40px; margin-bottom: 10px;"></div> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Journal paper            Paper in Spanish or English            The paper has been peer reviewed            The paper presents an experience or study with tested results</p> </div> <div style="border: 1px solid #ccc; background-color: #e74c3c; color: white; padding: 5px; text-align: center; margin-top: 10px;">  remove selected         </div>	<p><b>Exclusion Criteria</b></p> <div style="border: 1px solid #ccc; height: 40px; margin-bottom: 10px;"></div> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Paper has not been peer reviewed            Paper does not present an experience or study with tested results            Paper is not in English or in Spanish            This is not a journal paper            Paper is not accessible</p> </div> <div style="border: 1px solid #ccc; background-color: #e74c3c; color: white; padding: 5px; text-align: center; margin-top: 10px;">  remove selected         </div>
--	---

# Definition of the protocol

- Questions are defined to evaluate the quality of the selected articles

*Parsifal* Blog About Help fgarcia04 ⚙️ ↻

fgarcia04 / [Desarrollo y uso de la tecnología en educación](#) ⚙️ Review settings

Review **Planning** Conducting Reporting

Protocol **Quality Assessment Checklist** Data Extraction Form

**Quality Assessment Checklist**

Questions

Answers

Score

**Questions**

⌵ Are the research aims clearly specified? ✎ edit 🗑 remove

⌵ Is the study designed to achieve these aims? ✎ edit 🗑 remove

⌵ Have statistical techniques been used to analyze data? ✎ edit 🗑 remove

[+ Add Question](#)

**Answers**

Description	Weight	
Yes	1.0	✎ edit 🗑 remove
Partial	0.5	✎ edit 🗑 remove
No	0.0	✎ edit 🗑 remove

[+ Add Answer](#)

**Quality Assessment Scores**

**Max Score**  Calculated based on the number of questions and on the answer of greater weight

**Cutoff Score**  [✓ save](#)

# Definition of the protocol

- A form for data extraction is defined

*Parsifal* Blog About Help fgarcia04 | ⚙️ 🔄

fgarcia04 / [Desarrollo y uso de la tecnología en educación](#) ⚙️ Review settings

Review **Planning** Conducting Reporting

[Protocol](#) [Quality Assessment Checklist](#) **Data Extraction Form**

Data Extraction Form			
Description	Type	Values	
⌵ Authors	String Field	n/a	<span>✎ edit</span> <span>🗑 remove</span>
⌵ Journal	String Field	n/a	<span>✎ edit</span> <span>🗑 remove</span>
⌵ Year	Integer Field	n/a	<span>✎ edit</span> <span>🗑 remove</span>
⌵ DOI	String Field	n/a	<span>✎ edit</span> <span>🗑 remove</span>

➕ Add Field

# Review process

- The canonical equation must be transformed into equations that are specific to each of the data sources and that are equivalent
- To do this, you will go to the data source and use the search tool with the necessary refinements
- Finally, the equation with which you are going to work will be captured, that is, the one that generates the set of articles with which you are going to work

# Review process


fgarcia04 / **Desarrollo y uso de la tecnología en educación**

 Review settings

Review   Planning   **Conducting**   Reporting


1. Search   2. Import Studies   3. Study Selection   4. Quality Assessment   5. Data Extraction   6. Data Analysis

### Search Strings

 Add digital source-specific search strings. Use this space to save all search string formats used during the research.

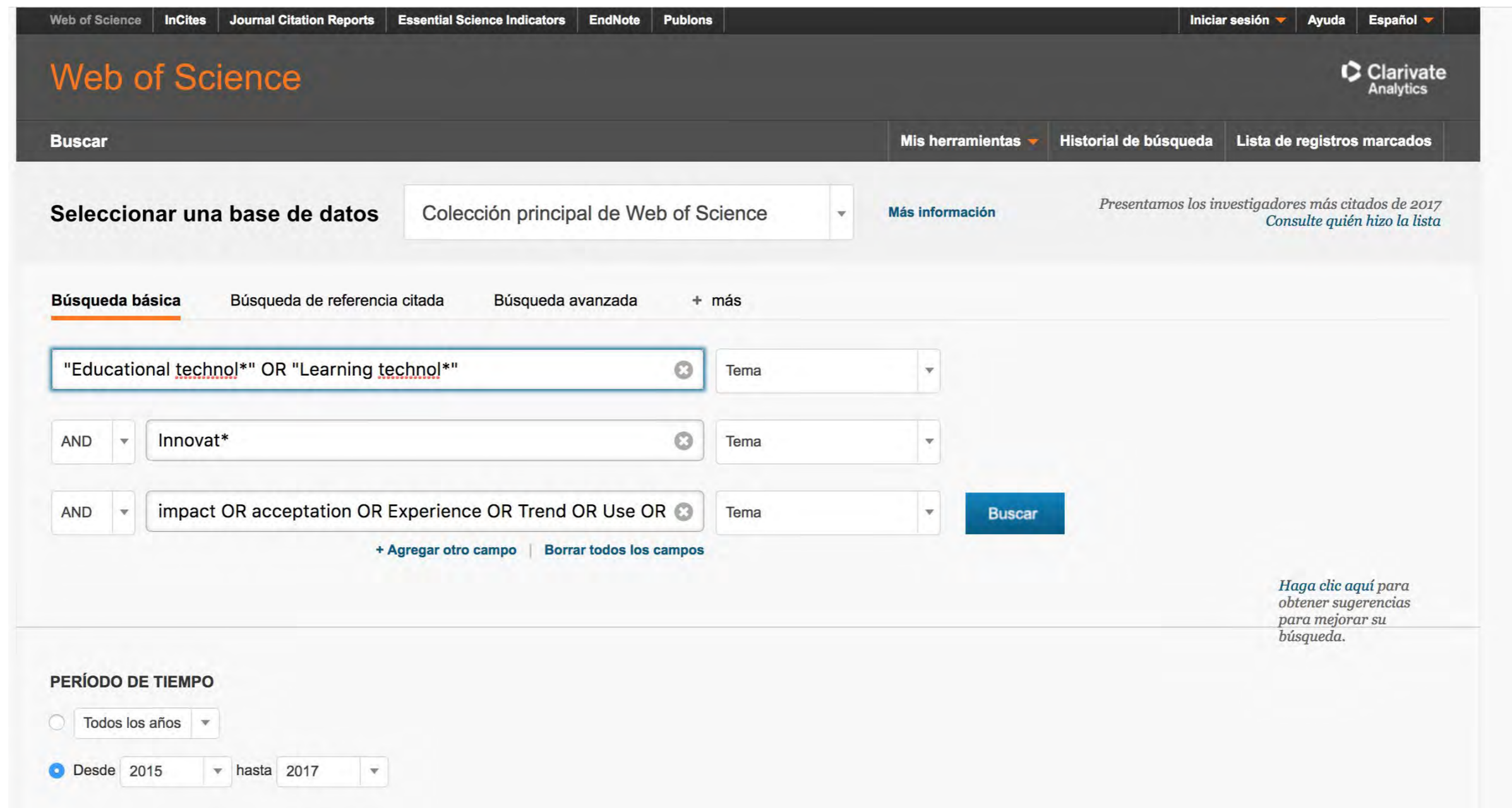
Base String   ISI Web of Science   Scopus

```
(("Educational technol*" OR "Learning techno*") AND ("innovat*")) AND ("Acceptation" OR "Development" OR "Experience" OR "Impact" OR "Use")
```

 Add source-specific search string

# Review process

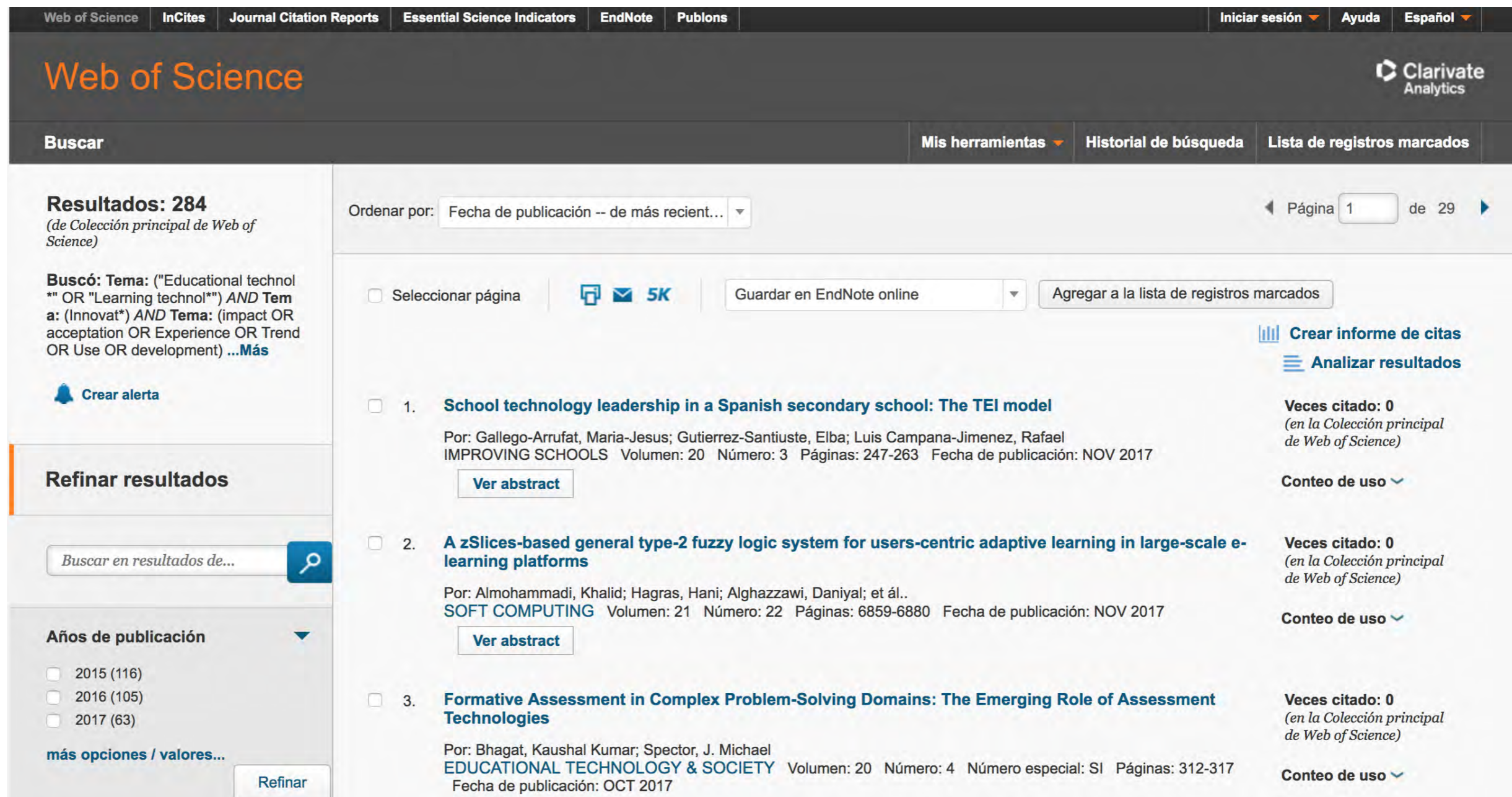
- WoS search is performed



The screenshot shows the Web of Science search interface. At the top, there are navigation links for 'Web of Science', 'InCites', 'Journal Citation Reports', 'Essential Science Indicators', 'EndNote', and 'Publons'. On the right, there are links for 'Iniciar sesión', 'Ayuda', and 'Español'. The main header features the 'Web of Science' logo and 'Clarivate Analytics' branding. Below the header, there is a search bar with the text 'Buscar' and navigation links for 'Mis herramientas', 'Historial de búsqueda', and 'Lista de registros marcados'. The main content area is titled 'Seleccionar una base de datos' and shows 'Colección principal de Web of Science' selected. There are also links for 'Más información' and a promotional message: 'Presentamos los investigadores más citados de 2017. Consulte quién hizo la lista'. Below this, there are tabs for 'Búsqueda básica', 'Búsqueda de referencia citada', and 'Búsqueda avanzada'. The 'Búsqueda básica' tab is active. The search criteria are entered in three fields: '"Educational technol\*" OR "Learning technol\*"' (with a dropdown menu set to 'Tema'), 'AND Innovat\*' (with a dropdown menu set to 'Tema'), and 'AND impact OR acceptance OR Experience OR Trend OR Use OR' (with a dropdown menu set to 'Tema'). There is a 'Buscar' button and links for '+ Agregar otro campo' and 'Borrar todos los campos'. At the bottom, there is a 'PERÍODO DE TIEMPO' section with radio buttons for 'Todos los años' and 'Desde 2015 hasta 2017'.

# Review process

- WoS search is performed



The screenshot shows the Web of Science search results interface. At the top, there are navigation tabs for 'Web of Science', 'InCites', 'Journal Citation Reports', 'Essential Science Indicators', 'EndNote', and 'Publons'. On the right, there are links for 'Iniciar sesión', 'Ayuda', and 'Español'. The main header features the 'Web of Science' logo and 'Clarivate Analytics' branding. Below the header, there are navigation options: 'Buscar', 'Mis herramientas', 'Historial de búsqueda', and 'Lista de registros marcados'.

The search results section displays 'Resultados: 284' (de Colección principal de Web of Science). The search criteria are: 'Buscó: Tema: ("Educational technol\*" OR "Learning technol\*") AND Tema: (Innovat\*) AND Tema: (impact OR acceptance OR Experience OR Trend OR Use OR development) ...Más'. There is a 'Crear alerta' button.

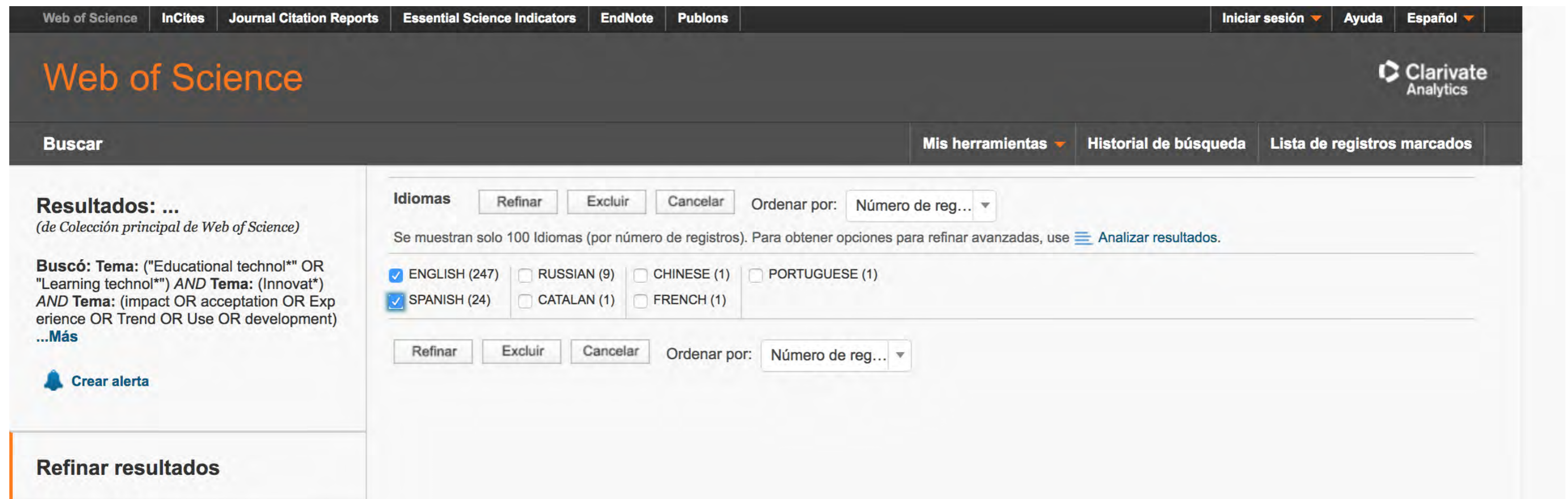
The 'Refinar resultados' section includes a search box for 'Buscar en resultados de...' and a filter for 'Años de publicación' with options for 2015 (116), 2016 (105), and 2017 (63). A 'Refinar' button is at the bottom.

The main results area shows three entries, ordered by 'Fecha de publicación -- de más recent...'. Each entry includes a checkbox, a title, author information, journal details, and a 'Ver abstract' button. The first entry is 'School technology leadership in a Spanish secondary school: The TEI model' by Gallego-Arrufat, Maria-Jesus; Gutierrez-Santiuste, Elba; Luis Campana-Jimenez, Rafael. The second is 'A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms' by Almohammadi, Khalid; Hagrass, Hani; Alghazzawi, Daniyal; et ál.. The third is 'Formative Assessment in Complex Problem-Solving Domains: The Emerging Role of Assessment Technologies' by Bhagat, Kaushal Kumar; Spector, J. Michael.

On the right side of the results, there are links for 'Crear informe de citas' and 'Analizar resultados'. Below these, the citation count is shown as 'Veces citado: 0 (en la Colección principal de Web of Science)' and a 'Conteo de uso' dropdown menu.

# Review process

- The appropriate refinements are made until the different constraints have been included and the dataset with which you are going to work is available

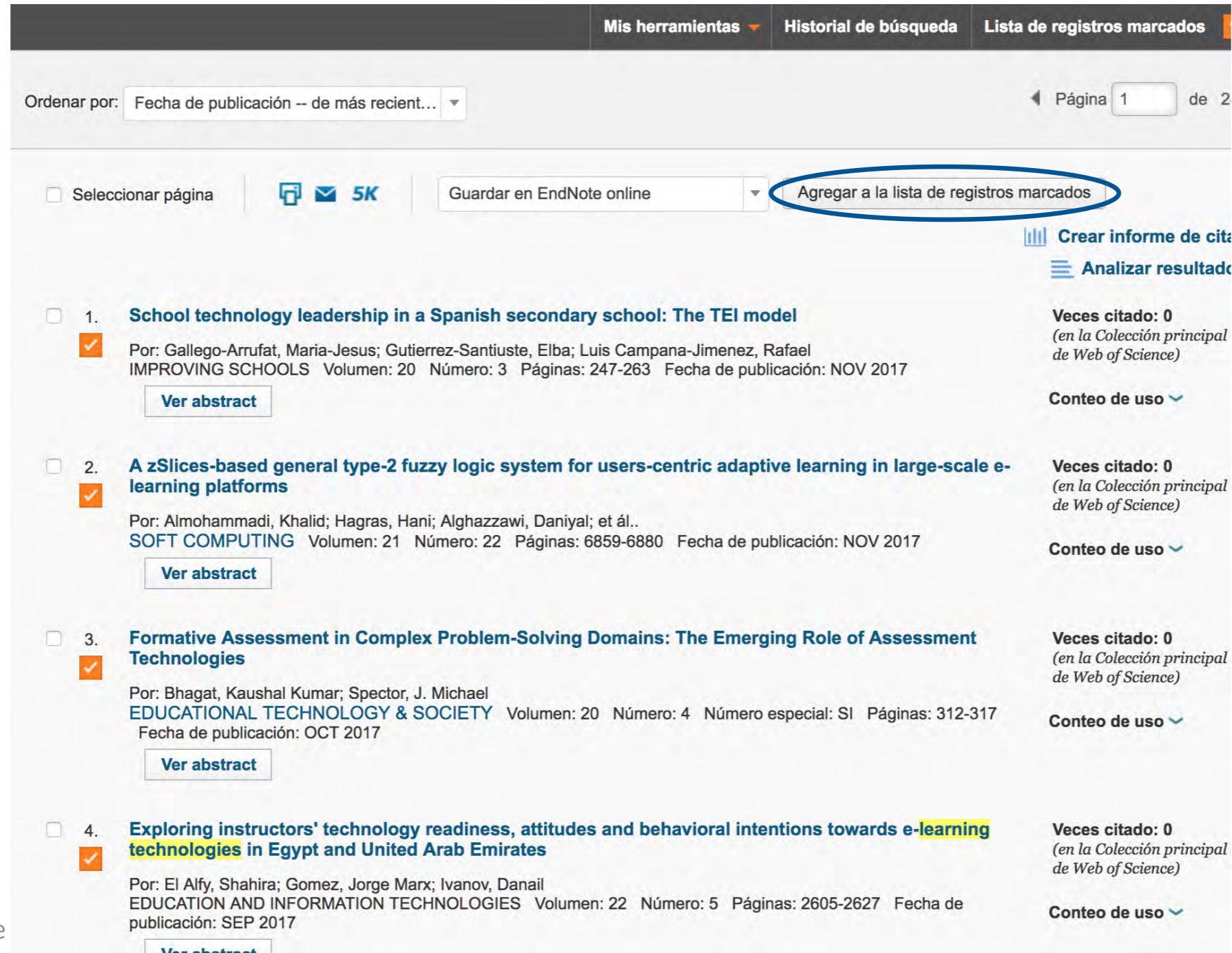


The screenshot shows the Web of Science interface with the following elements:

- Navigation Bar:** Includes links for Web of Science, InCites, Journal Citation Reports, Essential Science Indicators, EndNote, and Publons. On the right, there are links for 'Iniciar sesión', 'Ayuda', and 'Español'.
- Header:** Features the 'Web of Science' logo and the 'Clarivate Analytics' logo.
- Search Bar:** A 'Buscar' button is located on the left side of the header.
- Tools:** On the right side of the header, there are links for 'Mis herramientas', 'Historial de búsqueda', and 'Lista de registros marcados'.
- Results Section:**
  - Idiomas:** A section for refining results by language. It includes buttons for 'Refinar', 'Excluir', and 'Cancelar'. The current order is 'Número de reg...'. A note states: 'Se muestran solo 100 Idiomas (por número de registros). Para obtener opciones para refinar avanzadas, use [Analizar resultados](#).' Below this, there are checkboxes for: ENGLISH (247), SPANISH (24), RUSSIAN (9), CATALAN (1), CHINESE (1), FRENCH (1), and PORTUGUESE (1). The 'ENGLISH' and 'SPANISH' options are currently selected.
  - Refinement Controls:** A second set of 'Refinar', 'Excluir', and 'Cancelar' buttons, along with an 'Ordenar por: Número de reg...' dropdown menu, is located below the language options.
- Left Sidebar:**
  - Resultados:** Shows the search criteria: 'Buscó: Tema: ("Educational technol\*" OR "Learning technol\*") AND Tema: (Innovat\*) AND Tema: (impact OR acceptance OR Experience OR Trend OR Use OR development) ...Más'. There is a 'Crear alerta' button with a bell icon.
  - Refinar resultados:** A button to further refine the search results.

# Review process

- Once you have the dataset, you select the records



Mis herramientas ▾ Historial de búsqueda Lista de registros marcados

Ordenar por: Fecha de publicación -- de más recent... Página 1 de 2

Seleccionar página
 
 5K
 




 Agregar a la lista de registros marcados
 

[Crear informe de cita](#)  
[Analizar resultados](#)

<input type="checkbox"/>	1.	<b>School technology leadership in a Spanish secondary school: The TEI model</b>	<p>Por: Gallego-Arrufat, Maria-Jesus; Gutierrez-Santiuste, Elba; Luis Campana-Jimenez, Rafael            IMPROVING SCHOOLS Volumen: 20 Número: 3 Páginas: 247-263 Fecha de publicación: NOV 2017</p> <p><a href="#">Ver abstract</a></p>	<p><b>Veces citado: 0</b>            (en la Colección principal de Web of Science)</p> <p>Conteo de uso ▾</p>
<input type="checkbox"/>	2.	<b>A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms</b>	<p>Por: Almohammadi, Khalid; Hagra, Hani; Alghazzawi, Daniyal; et ál.            SOFT COMPUTING Volumen: 21 Número: 22 Páginas: 6859-6880 Fecha de publicación: NOV 2017</p> <p><a href="#">Ver abstract</a></p>	<p><b>Veces citado: 0</b>            (en la Colección principal de Web of Science)</p> <p>Conteo de uso ▾</p>
<input type="checkbox"/>	3.	<b>Formative Assessment in Complex Problem-Solving Domains: The Emerging Role of Assessment Technologies</b>	<p>Por: Bhagat, Kaushal Kumar; Spector, J. Michael            EDUCATIONAL TECHNOLOGY &amp; SOCIETY Volumen: 20 Número: 4 Número especial: SI Páginas: 312-317            Fecha de publicación: OCT 2017</p> <p><a href="#">Ver abstract</a></p>	<p><b>Veces citado: 0</b>            (en la Colección principal de Web of Science)</p> <p>Conteo de uso ▾</p>
<input type="checkbox"/>	4.	<b>Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technologies in Egypt and United Arab Emirates</b>	<p>Por: El Alfy, Shahira; Gomez, Jorge Marx; Ivanov, Danail            EDUCATION AND INFORMATION TECHNOLOGIES Volumen: 22 Número: 5 Páginas: 2605-2627 Fecha de publicación: SEP 2017</p> <p><a href="#">Ver abstract</a></p>	<p><b>Veces citado: 0</b>            (en la Colección principal de Web of Science)</p> <p>Conteo de uso ▾</p>

# Review process

- The records are exported to work with them in the format you want: Bibtex, EndNote, Delimited File, etc.

registros totales en la lista de registros marcados  
 Extraer el autor, el título, la fuente y el abstract de todos los registros de la lista de registros marcados así como las veces que se han citado.

registros de **Colección principal de Web of Science**  
 Extraer de este producto datos completos de estos registros.

Extraer registros [ - Ocultar opciones de salida ] | 5K

**Paso 1: Seleccionar registros**

Todos los registros en esta lista (hasta 500)

Todos los registros en página

Registros  hasta

**Paso 2: Seleccionar contenido**  
 Seleccionar de los siguientes campos:

**Paso 3: Seleccionar destino** [Más información sobre cómo guardar contenido en un programa de gestión bibliográfica]

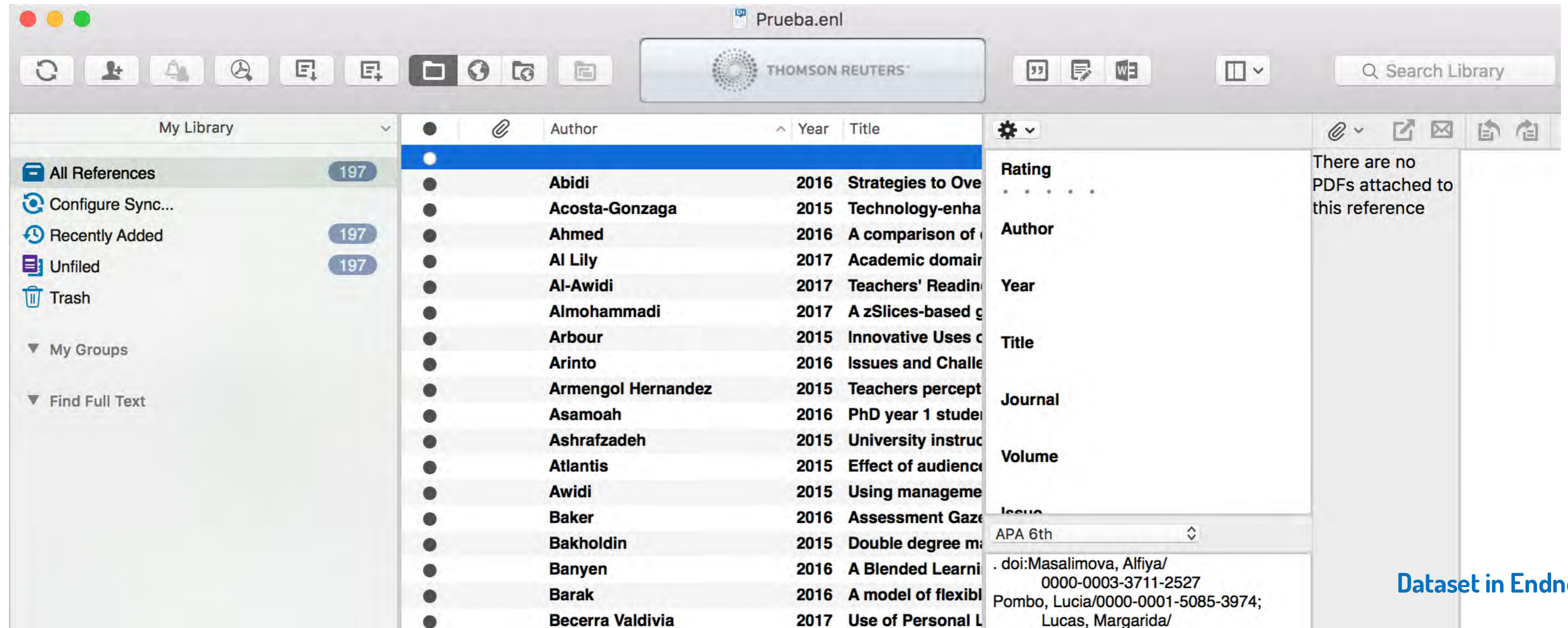
Seleccionar todo | [Restablecer](#)

<input checked="" type="checkbox"/> Autor(es)/Editor(es)	<input checked="" type="checkbox"/> Título	<input checked="" type="checkbox"/> Fuente	<input checked="" type="checkbox"/> Información sobre la conferencia
<input checked="" type="checkbox"/> Abstract*	<input type="checkbox"/> Referencias citadas*	<input checked="" type="checkbox"/> Tipo de documento	<input type="checkbox"/> Patrocinadores de la conferencia
<input type="checkbox"/> Direcciones	<input checked="" type="checkbox"/> Veces citado	<input type="checkbox"/> Palabras clave	<input type="checkbox"/> Información sobre la editorial
<input checked="" type="checkbox"/> ISSN/ISBN	<input type="checkbox"/> Número de referencias citadas	<input type="checkbox"/> Abrev. de fuente	<input type="checkbox"/> Número de páginas
<input type="checkbox"/> Número IDS	<input type="checkbox"/> Idioma	<input type="checkbox"/> Categorías de Web of Science	<input type="checkbox"/> Áreas de investigación
<input type="checkbox"/> Información de financiación	<input checked="" type="checkbox"/> Número de acceso	<input checked="" type="checkbox"/> Identificadores de autores	<input type="checkbox"/> Conteo de uso
<input checked="" type="checkbox"/> ID de PubMed	<input checked="" type="checkbox"/> Acceso abierto	<input type="checkbox"/> Artículo popular	<input type="checkbox"/> Muy citado

*\*Al seleccionar estos elementos, el tiempo de procesamiento aumentará.*

# Review process

- You already have the dataset to work with



The screenshot shows the EndNote software interface. On the left is a sidebar with navigation options like 'All References' (197), 'Recently Added' (197), and 'Unfiled' (197). The main area displays a table of references with columns for Author, Year, and Title. The first row is selected, showing details for a reference by Abidi (2016) titled 'Strategies to Over...'. To the right of the table is a detailed view of the selected reference, including fields for Rating, Author, Year, Title, Journal, Volume, and Issue. The 'Issue' field is currently set to 'APA 6th'. Below the detailed view, there is a text area containing the reference in APA 6th format: 'doi:Masalimova, Alfiya/0000-0003-3711-2527; Pombo, Lucia/0000-0001-5085-3974; Lucas, Margarida/'.

Author	Year	Title
Abidi	2016	Strategies to Over
Acosta-Gonzaga	2015	Technology-enha
Ahmed	2016	A comparison of
Al Lily	2017	Academic domain
Al-Awidi	2017	Teachers' Readin
Almohammadi	2017	A zSlices-based g
Arbour	2015	Innovative Uses c
Arinto	2016	Issues and Challe
Armengol Hernandez	2015	Teachers percept
Asamoah	2016	PhD year 1 studen
Ashrafzadeh	2015	University instruc
Atlantis	2015	Effect of audienc
Awidi	2015	Using managemen
Baker	2016	Assessment Gaze
Bakholdin	2015	Double degree ma
Banyen	2016	A Blended Learnin
Barak	2016	A model of flexibl
Becerra Valdivia	2017	Use of Personal L

There are no PDFs attached to this reference

Rating  
.....

Author

Year

Title

Journal

Volume

Issue  
APA 6th

. doi:Masalimova, Alfiya/  
0000-0003-3711-2527  
Pombo, Lucia/0000-0001-5085-3974;  
Lucas, Margarida/

Dataset in Endnote

# Review process

- You already have the dataset to work with

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	PT	AU	BA	CA	GP	RI	OI	BE	Z2	TI	X1	Y1	Z1	FT	PN	AE	Z3	SO	S1	SE	BS	VL
2	J	Gallego-Arrufat, Maria-Jesus; Gutierrez-Santiuste, Elba; Luis Campana-Jimenez, Rafael								School technology leadership in a Spanish secondary school: The TEI model								IMPROVING SCHOOLS				
3	J	Almohammadi, Khalid; Hagra, Hani; Alghazzawi, Daniyal; Aldabbagh, Ghadah								A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning								SOFT COMPUTING				
4	J	Bhagat, Kaushal Kumar; Spector, J. Michael								Formative Assessment in Complex Problem-Solving Domains: The Emerging Role of Assessment Technology								EDUCATIONAL TECHNOLOGY & SOCIETY				
5	J	El Alfy, Shahira; Gomez, Jorge Marx; Ivanov, Danail								Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technology								EDUCATION AND INFORMATION TECHNOLOGIES				
6	J	Fleaca, Elena								Entrepreneurial Curriculum through Digital-Age Learning in Higher Education - A Process-based Model								TEM JOURNAL-TECHNOLOGY EDUCATION MANAGEM				
7	J	Masalimova, Alfiya R.; Levina, Elena Y.; Platonova, Ra Masalimova, Masalimova, Alfiya/0000-0003-3711-25								Cognitive Simulation as Integrated Innovative Technology in Teaching of Social and Humanitarian Disciplines								EURASIA JOURNAL OF MATHEMATICS SCIENCE AND				
8	J	Wang, Ya-huei; Liao, Hung-Chang								Learning Performance Enhancement Using Computer-Assisted Language Learning by Collaborative Learning								SYMMETRY-BASEL				
9	J	Shimbo, Tomoko; Khaliullina, Alina Airatovna; Grinyova, Daria Vladimirovna								PROJECT-BASED LEARNING IN JAPANESE LANGUAGE								QUID-INVESTIGACION CIENCIA Y TECNOLOGIA				
10	J	Nailjeva, Ainoutdinova Irina; Arturovna, Ainoutdinova Karina								WEB-BASED TOOLS FOR EFFICIENT FOREIGN LANGUAGE TRAINING AT UNIVERSITY								MODERN JOURNAL OF LANGUAGE TEACHING METHO				
11	J	Yucel, Ummuhan Avci								Perceptions of pedagogical formation students about Web 2.0 tools and educational practices								EDUCATION AND INFORMATION TECHNOLOGIES				
12	J	Jain, Nickul S.; Schwarzkopf, Ran; Scolaro, John A.								Video Review as a Tool to Improve Orthopedic Residents' Performance of Closed Manipulative Reductions								JOURNAL OF SURGICAL EDUCATION				
13	J	Press, Valerie G.; Kelly, Colleen A.; Kim, John J.; White, Steven R.; Meltzer, David O.; Arora, Vineet M.								Virtual Teach-To-Goal (TM) Adaptive Learning of Inhaler Technique for Inpatients with Asthma or COPD								JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY-				
14	J	Guo, Shesen; Zhang, Ganzhou								Analyzing concept complexity, knowledge ageing and diffusion pattern of Mooc								SCIENTOMETRICS				
15	J	Sumak, Bostjan; Pusnik, Maja; Hericko, Marjan; Sorgo, Andrej								Differences between prospective, existing, and former users of interactive whiteboards on external factors								COMPUTERS IN HUMAN BEHAVIOR				
16	J	Giannakos, Michail N.; Divitini, Monica; Iversen, Ole Sejer								Entertainment, engagement, and education: Foundations and developments in digital and physical spaces								ENTERTAINMENT COMPUTING				
17	J	Coglianese, Cary; Lehr, David								Regulating by Robot: Administrative Decision Making in the Machine-Learning Era								GEORGETOWN LAW JOURNAL				
18	J	Al Lily, Abdulrahman E.; Foland, Jed; Stoloff, David; G; Malmi, Laur Pombo, Lucia/0000-0001-5085-3974; Lu								Academic domains as political battlegrounds: A global enquiry by 99 academics in the fields of education a								INFORMATION DEVELOPMENT				
19	J	Jeong, Hye In; Kim, Yeolib								The acceptance of computer technology by teachers in early childhood education								INTERACTIVE LEARNING ENVIRONMENTS				
20	J	Demikhova, N.; Smilianov, V; Smilianov, Y.; Lukyanikhin, V								The Benefits of Innovative Technologies in Teaching Subjects in Medical Education								RESEARCH JOURNAL OF PHARMACEUTICAL BIOLOGI				
21	J	Li, Yao								Study of educational technology innovation based on the perspective of big data								AGRO FOOD INDUSTRY HI-TECH				
22	J	Osakwe, Jude; Dlodlo, Nomusa; Jere, Nobert								Where learners' and teachers' perceptions on mobile learning meet: A case of Namibian secondary school								TECHNOLOGY IN SOCIETY				
23	J	Valcanti Avelino, Carolina Costa; Scalon da Costa, Livia Cristina; Marques Buchhorn, Soraia Matilde; Nogue								Teaching-learning evaluation on the ICNP (R) using virtual learning environment								REVISTA BRASILEIRA DE ENFERMAGEM				
24	J	Gonzalez Izard, Santiago; Juanes Mendez, Juan A.; Ruisoto Palomera, Pablo								Virtual Reality Educational Tool for Human Anatomy								JOURNAL OF MEDICAL SYSTEMS				
25	J	Zakirova, Venera G.; Kayumova, Leysan R.; Sabirova, Kayumova, L Kayumova, Leysan/0000-0001-7364-49								ORGANIZATION TECHNIQUES OF PROBLEM DIALOGUE AT ELEMENTARY SCHOOL LITERATURE LESSONS								MODERN JOURNAL OF LANGUAGE TEACHING METHO				
26	J	Camilleri, Mark Anthony; Camilleri, Adriana Caterina								Digital Learning Resources and Ubiquitous Technologies in Education								TECHNOLOGY KNOWLEDGE AND LEARNING				
27	J	Mbatia, Lydia								Creating Awareness around Rhizomatic Principles in mLearning: A Means to Improving Practice								INTERNATIONAL JOURNAL OF MOBILE AND BLENDED				
28	J	Geetha, P.; Cherukulath, Wilson K.; Sivakumar, R.								Facilitating E-learning through National Knowledge Network								DESIDOC JOURNAL OF LIBRARY & INFORMATION TEC				
29	J	Kowitlawakul, Yanika; Chan, Moon Fai; Tan, Sharon Swee Lin; Soor Kowitlawakul, Yanika/0000-0003-1429-								Development of an e-Learning Research Module Using Multimedia Instruction Approach								CIN-COMPUTERS INFORMATICS NURSING				
30	J	Clark, Angela; Glazer, Greer; Edwards, Christopher; Pryse, Yvette								Transforming Nursing Education With Apple Technology								NURSE EDUCATOR				
31	J	Gu, Xiaoqing; Xu, Xiaojuan; Wang, Huawen; Crook, Charles Crook, Charles/0000-0002-2793-9793								Design possibilities for the e-Schoolbag: Addressing the 1:1 challenge within China								BRITISH JOURNAL OF EDUCATIONAL TECHNOLOGY				
32	J	Bennett, Sue; Dawson, Phillip; Bearman, Margaret; Molloy, Elizabeth Dawson, Phillip/0000-0002-4513-8287								How technology shapes assessment design: Findings from a study of university teachers								BRITISH JOURNAL OF EDUCATIONAL TECHNOLOGY				
33	J	Kotcherlakota, Suhasini; Kupzyk, Kevin A.; Rejda, Patrick								Years of Experience as a Predictor of Nurse Faculty Technology Use								JOURNAL OF NURSING EDUCATION				
34	J	Martin-Gutierrez, Jorge; Efen Mora, Carlos; Anorbe-Diaz, Beatriz; Martin-Gutierrez, Jorge/0000-0002-836								Virtual Technologies Trends in Education								EURASIA JOURNAL OF MATHEMATICS SCIENCE AND				
35	J	Nicolete, Priscila Cadorin; Sommer Bilessimo, Simone Meister; da Silva Cristiano, Marta Adriana; Scharodosi								Technology Integration Actions in Mathematics teaching in Brazilian Basic Education: Stimulating STEM dis								RED-REVISTA DE EDUCACION A DISTANCIA				
36	J	Tobase, Lucia; Ciqueto Peres, Heloisa Helena; Sartorelli Tomazini, Edenir Aparecida; Teodoro, Simone Vale								Basic life support: evaluation of learning using simulation and immediate feedback devices								REVISTA LATINO-AMERICANA DE ENFERMAGEM				
37	J	Vasylyk, Maryna; Rusnak, Ivan								IMPROVEMENT OF FOREIGN LANGUAGE TRAINING OF FUTURE PRIMARY SCHOOL TEACHERS								SCIENCE AND EDUCATION				
38	J	Reid, Pat								Supporting instructors in overcoming self-efficacy and background barriers to adoption								EDUCATION AND INFORMATION TECHNOLOGIES				
39	J	Squire, Kurt								Innovation in times of uncertainty								ON THE HORIZON				
40	J	Gupta, Vikas; Jain, Namita								Harnessing information and communication technologies for effective knowledge creation Shaping the fut								JOURNAL OF ENTERPRISE INFORMATION MANAGEM				
41	J	Veloso, Teemu Sainio; Erkkö, Kerkkonen, Jari; Kerkkonen, Sini; Lambert, Matthew C.; Makitala, Sini; Kerkkonen, Teemu Sainio								TRACK updated to measure pre-service teachers' twenty-first century skills								AUSTRALASIAN JOURNAL OF EDUCATIONAL TECHNO				

Dataset in CSV

# Review process

- You already have the dataset to work with

```

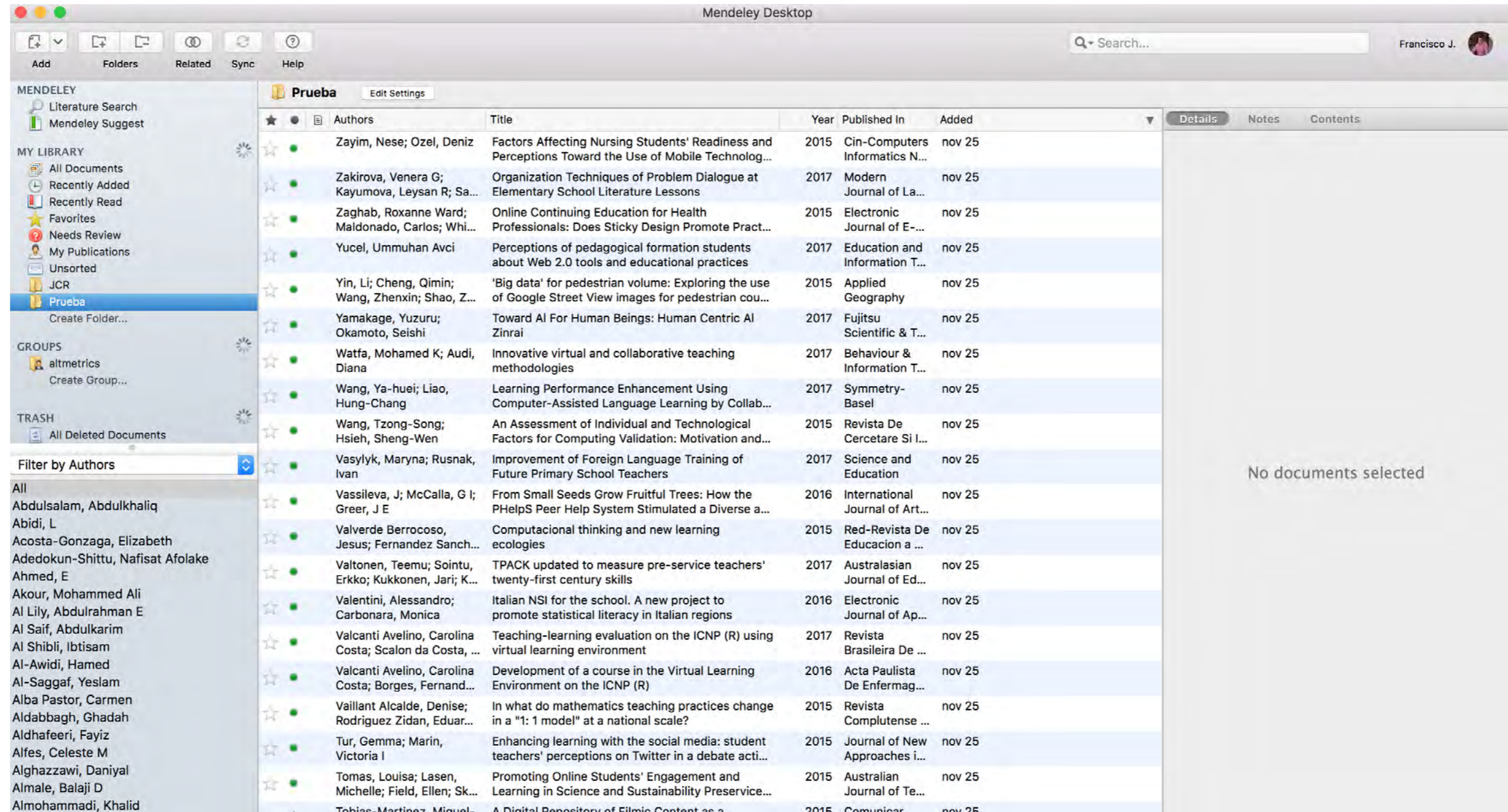
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```

XML dataset

# Review process

- You already have the dataset to work with



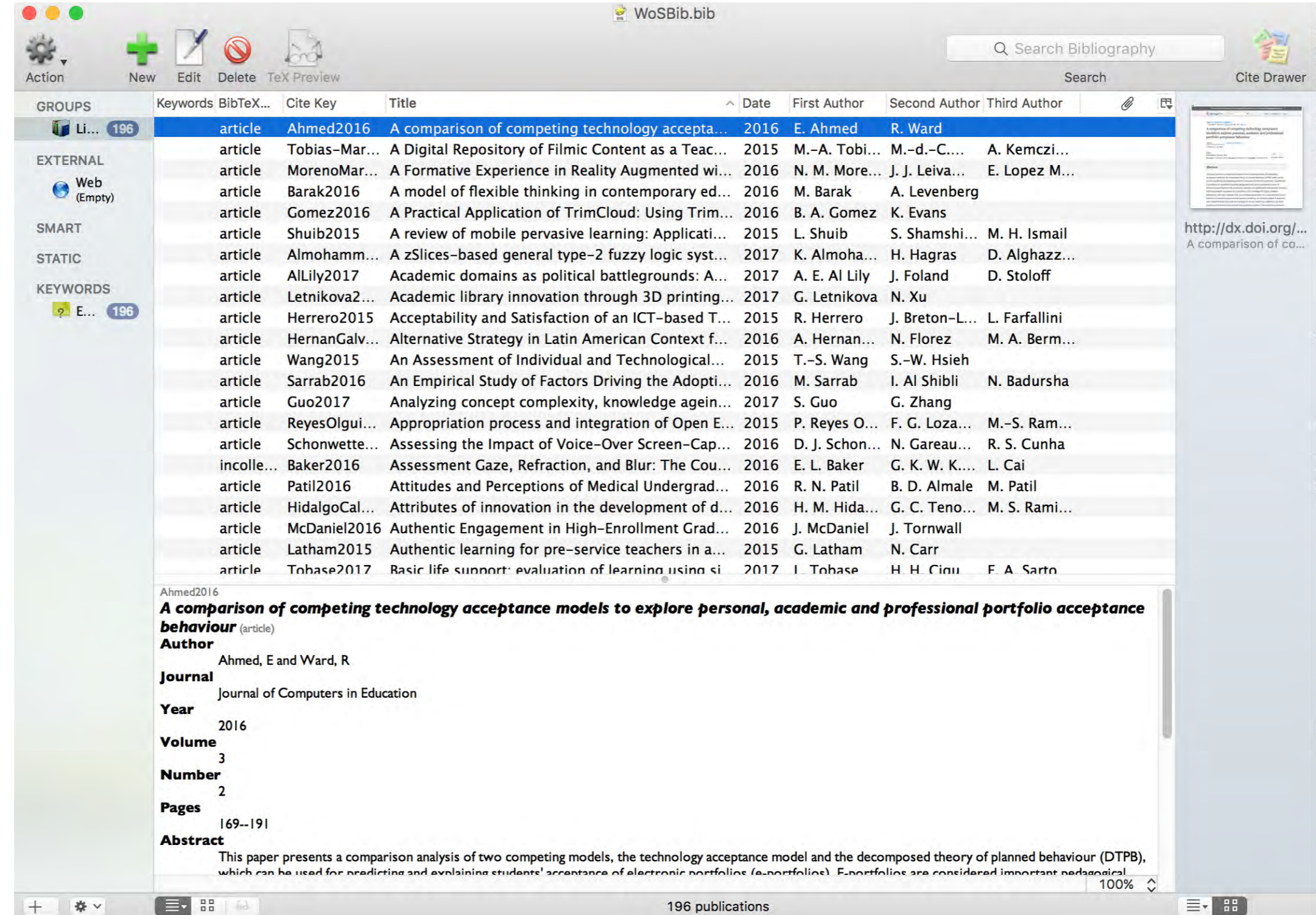
The screenshot shows the Mendeley Desktop interface. On the left, there is a sidebar with sections for 'MENDELEY', 'MY LIBRARY', 'GROUPS', and 'TRASH'. The 'MY LIBRARY' section is expanded to show a list of authors under the heading 'Filter by Authors'. The main area displays a table of documents with columns for Authors, Title, Year, Published In, and Added. The table contains 20 rows of data, each representing a research paper. The right side of the interface shows a 'Details' panel with the text 'No documents selected'.

Authors	Title	Year	Published In	Added
Zayim, Nese; Ozel, Deniz	Factors Affecting Nursing Students' Readiness and Perceptions Toward the Use of Mobile Technolog...	2015	Cin-Computers Informatics N...	nov 25
Zakirova, Venera G; Kayumova, Leysan R; Sa...	Organization Techniques of Problem Dialogue at Elementary School Literature Lessons	2017	Modern Journal of La...	nov 25
Zaghab, Roxanne Ward; Maldonado, Carlos; Whi...	Online Continuing Education for Health Professionals: Does Sticky Design Promote Pract...	2015	Electronic Journal of E-...	nov 25
Yucel, Ummuhan Avci	Perceptions of pedagogical formation students about Web 2.0 tools and educational practices	2017	Education and Information T...	nov 25
Yin, Li; Cheng, Qimin; Wang, Zhenxin; Shao, Z...	'Big data' for pedestrian volume: Exploring the use of Google Street View images for pedestrian cou...	2015	Applied Geography	nov 25
Yamakage, Yuzuru; Okamoto, Seishi	Toward AI For Human Beings: Human Centric AI Zinrai	2017	Fujitsu Scientific & T...	nov 25
Watfa, Mohamed K; Audi, Diana	Innovative virtual and collaborative teaching methodologies	2017	Behaviour & Information T...	nov 25
Wang, Ya-huei; Liao, Hung-Chang	Learning Performance Enhancement Using Computer-Assisted Language Learning by Collab...	2017	Symmetry-Basel	nov 25
Wang, Tzong-Song; Hsieh, Sheng-Wen	An Assessment of Individual and Technological Factors for Computing Validation: Motivation and...	2015	Revista De Cercetare Si I...	nov 25
Vasylyk, Maryna; Rusnak, Ivan	Improvement of Foreign Language Training of Future Primary School Teachers	2017	Science and Education	nov 25
Vassileva, J; McCalla, G I; Greer, J E	From Small Seeds Grow Fruitful Trees: How the PHelpS Peer Help System Stimulated a Diverse a...	2016	International Journal of Art...	nov 25
Valverde Berrocoso, Jesus; Fernandez Sanch...	Computacional thinking and new learning ecologies	2015	Red-Revista De Educacion a ...	nov 25
Valtonen, Teemu; Sointu, Erkkö; Kukkonen, Jari; K...	TPACK updated to measure pre-service teachers' twenty-first century skills	2017	Australasian Journal of Ed...	nov 25
Valentini, Alessandro; Carbonara, Monica	Italian NSI for the school. A new project to promote statistical literacy in Italian regions	2016	Electronic Journal of Ap...	nov 25
Valcanti Avelino, Carolina Costa; Scalon da Costa, ...	Teaching-learning evaluation on the ICNP (R) using virtual learning environment	2017	Revista Brasileira De ...	nov 25
Valcanti Avelino, Carolina Costa; Borges, Fernand...	Development of a course in the Virtual Learning Environment on the ICNP (R)	2016	Acta Paulista De Enfermag...	nov 25
Vaillant Alcalde, Denise; Rodriguez Zidan, Eduar...	In what do mathematics teaching practices change in a "1: 1 model" at a national scale?	2015	Revista Complutense ...	nov 25
Tur, Gemma; Marin, Victoria I	Enhancing learning with the social media: student teachers' perceptions on Twitter in a debate acti...	2015	Journal of New Approaches i...	nov 25
Tomas, Louisa; Lasen, Michelle; Field, Ellen; Sk...	Promoting Online Students' Engagement and Learning in Science and Sustainability Preservice...	2015	Australian Journal of Te...	nov 25
Tobias-Martinez, Miguel	A Digital Repository of Filmic Content as a	2015	Comunicar	nov 25

Dataset in Mendely

# Review process

- You already have the dataset to work with



The screenshot shows the WoSbib.bib application interface. The main window displays a list of bibliographic entries with columns for Keywords, BibTeX..., Cite Key, Title, Date, First Author, Second Author, and Third Author. The entry for Ahmed2016 is selected and highlighted in blue.

Keywords	BibTeX...	Cite Key	Title	Date	First Author	Second Author	Third Author
article	Ahmed2016	Ahmed2016	A comparison of competing technology accepta...	2016	E. Ahmed	R. Ward	
article	Tobias-Mar...	Tobias-Mar...	A Digital Repository of Filmic Content as a Teac...	2015	M.-A. Tobi...	M.-d.-C...	A. Kemczi...
article	MorenoMar...	MorenoMar...	A Formative Experience in Reality Augmented wi...	2016	N. M. More...	J. J. Leiva...	E. Lopez M...
article	Barak2016	Barak2016	A model of flexible thinking in contemporary ed...	2016	M. Barak	A. Levenberg	
article	Gomez2016	Gomez2016	A Practical Application of TrimCloud: Using Trim...	2016	B. A. Gomez	K. Evans	
article	Shuib2015	Shuib2015	A review of mobile pervasive learning: Applicati...	2015	L. Shuib	S. Shamshi...	M. H. Ismail
article	Almohamm...	Almohamm...	a zSlices-based general type-2 fuzzy logic syst...	2017	K. Almoha...	H. Hagra...	D. Alghazz...
article	ALlily2017	ALlily2017	Academic domains as political battlegrounds: A...	2017	A. E. Al Lily	J. Foland	D. Stoloff
article	Letnikova2...	Letnikova2...	Academic library innovation through 3D printing...	2017	G. Letnikova	N. Xu	
article	Herrero2015	Herrero2015	Acceptability and Satisfaction of an ICT-based T...	2015	R. Herrero	J. Breton-L...	L. Farfallini
article	HernanGalv...	HernanGalv...	Alternative Strategy in Latin American Context f...	2016	A. Hernan...	N. Florez	M. A. Berm...
article	Wang2015	Wang2015	An Assessment of Individual and Technological...	2015	T.-S. Wang	S.-W. Hsieh	
article	Sarrab2016	Sarrab2016	An Empirical Study of Factors Driving the Adopt...	2016	M. Sarrab	I. Al Shibli	N. Badursha
article	Guo2017	Guo2017	Analyzing concept complexity, knowledge agein...	2017	S. Guo	G. Zhang	
article	ReyesOlgui...	ReyesOlgui...	Appropriation process and integration of Open E...	2015	P. Reyes O...	F. G. Loza...	M.-S. Ram...
article	Schonwette...	Schonwette...	Assessing the Impact of Voice-Over Screen-Cap...	2016	D. J. Schon...	N. Gareau...	R. S. Cunha
incolle...	Baker2016	Baker2016	Assessment Gaze, Refraction, and Blur: The Cou...	2016	E. L. Baker	G. K. W. K...	L. Cai
article	Patil2016	Patil2016	Attitudes and Perceptions of Medical Undergrad...	2016	R. N. Patil	B. D. Almale	M. Patil
article	HidalgoCal...	HidalgoCal...	Attributes of innovation in the development of d...	2016	H. M. Hida...	G. C. Teno...	M. S. Rami...
article	McDaniel2016	McDaniel2016	Authentic Engagement in High-Enrollment Grad...	2016	J. McDaniel	J. Tornwall	
article	Latham2015	Latham2015	Authentic learning for pre-service teachers in a...	2015	G. Latham	N. Carr	
article	Tobase2017	Tobase2017	Basic life support: evaluation of learning using si...	2017	I. Tobase	H. H. Ciau	F. A. Sarto

The detailed view of the selected entry (Ahmed2016) shows the following information:

- Author:** Ahmed, E and Ward, R
- Journal:** Journal of Computers in Education
- Year:** 2016
- Volume:** 3
- Number:** 2
- Pages:** 169--191
- Abstract:** This paper presents a comparison analysis of two competing models, the technology acceptance model and the decomposed theory of planned behaviour (DTPB), which can be used for predicting and explaining students' acceptance of electronic portfolios (e-portfolios). E-portfolios are considered important pedagogical...

Dataset in BibTeX

# Review process

- The search equation is saved in WoS

fgarcia04 / **Desarrollo y uso de la tecnología en educación** Review settings

Review Planning **Conducting** Reporting

1. Search 2. Import Studies 3. Study Selection 4. Quality Assessment 5. Data Extraction 6. Data Analysis

**Search Strings** ?

*i* Add digital source-specific search strings. Use this space to save all search string formats used during the research.

Base String ISI Web of Science Scopus

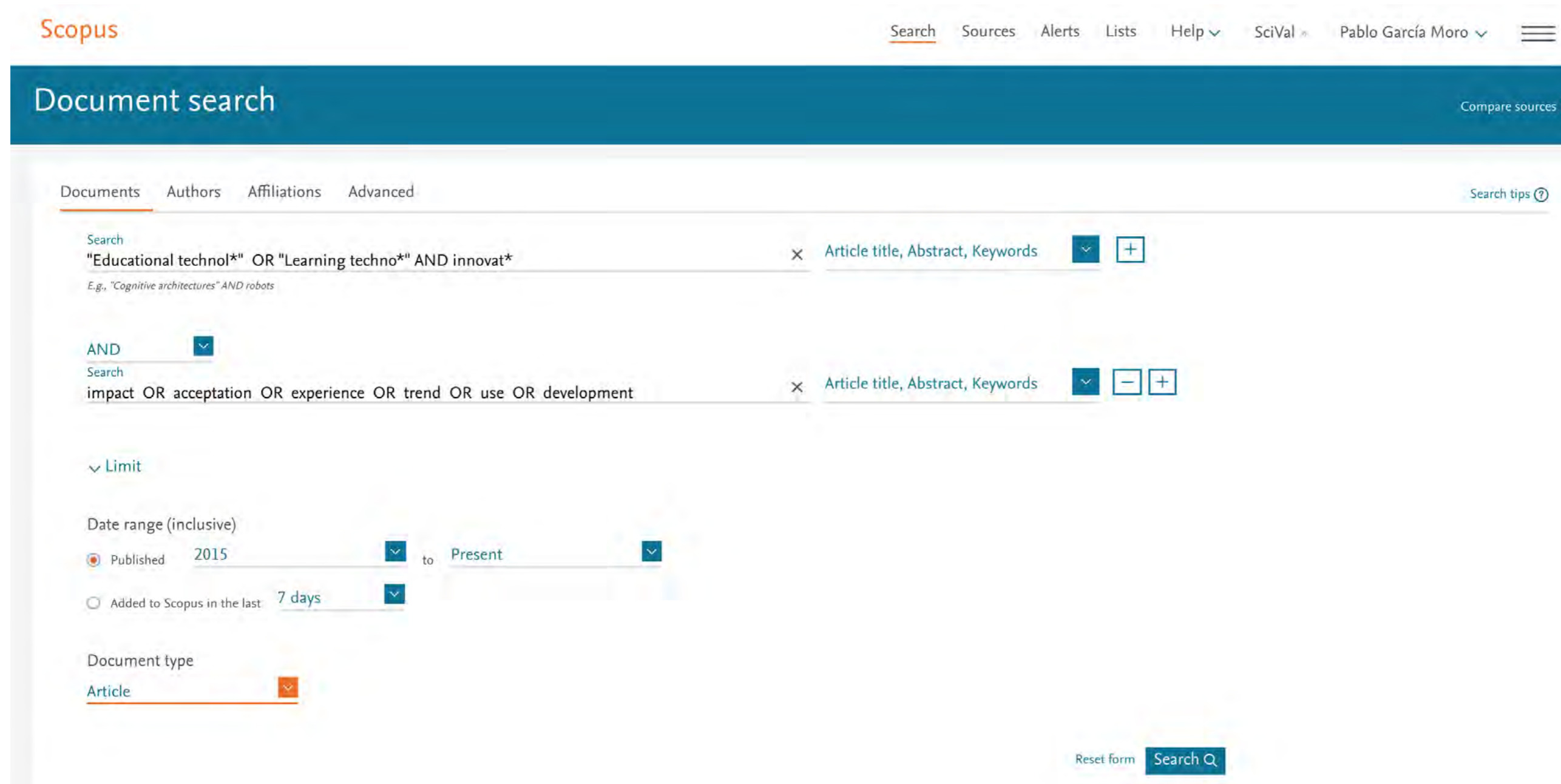
Tema: ("Educational technol\*" OR "Learning technol\*") AND Tema: ("Innovat\*") AND Tema: (impact OR acceptance OR Experience OR Trend OR Use OR development)  
 Refinado por: Tipos de documento: ( ARTICLE ) AND Bases de datos: ( WOS ) AND Idiomas: ( ENGLISH OR SPANISH )  
 Período de tiempo: 2015-2017.  
 Idioma de búsqueda=Auto

Save Import Base String Remove ISI Web of Science

+ Add source-specific search string

# Review process

- Search is done in Scopus



Scopus

Search Sources Alerts Lists Help ▾ SciVal Pablo García Moro ▾

## Document search

Compare sources >

Documents Authors Affiliations Advanced Search tips ?

Search

"Educational technol\*" OR "Learning techno\*" AND innovat\*

*E.g., "Cognitive architectures" AND robots*

Article title, Abstract, Keywords ▾ +

AND ▾

Search

impact OR acceptance OR experience OR trend OR use OR development

Article title, Abstract, Keywords ▾ - +

Limit

Date range (inclusive)

Published 2015 ▾ to Present ▾

Added to Scopus in the last 7 days ▾

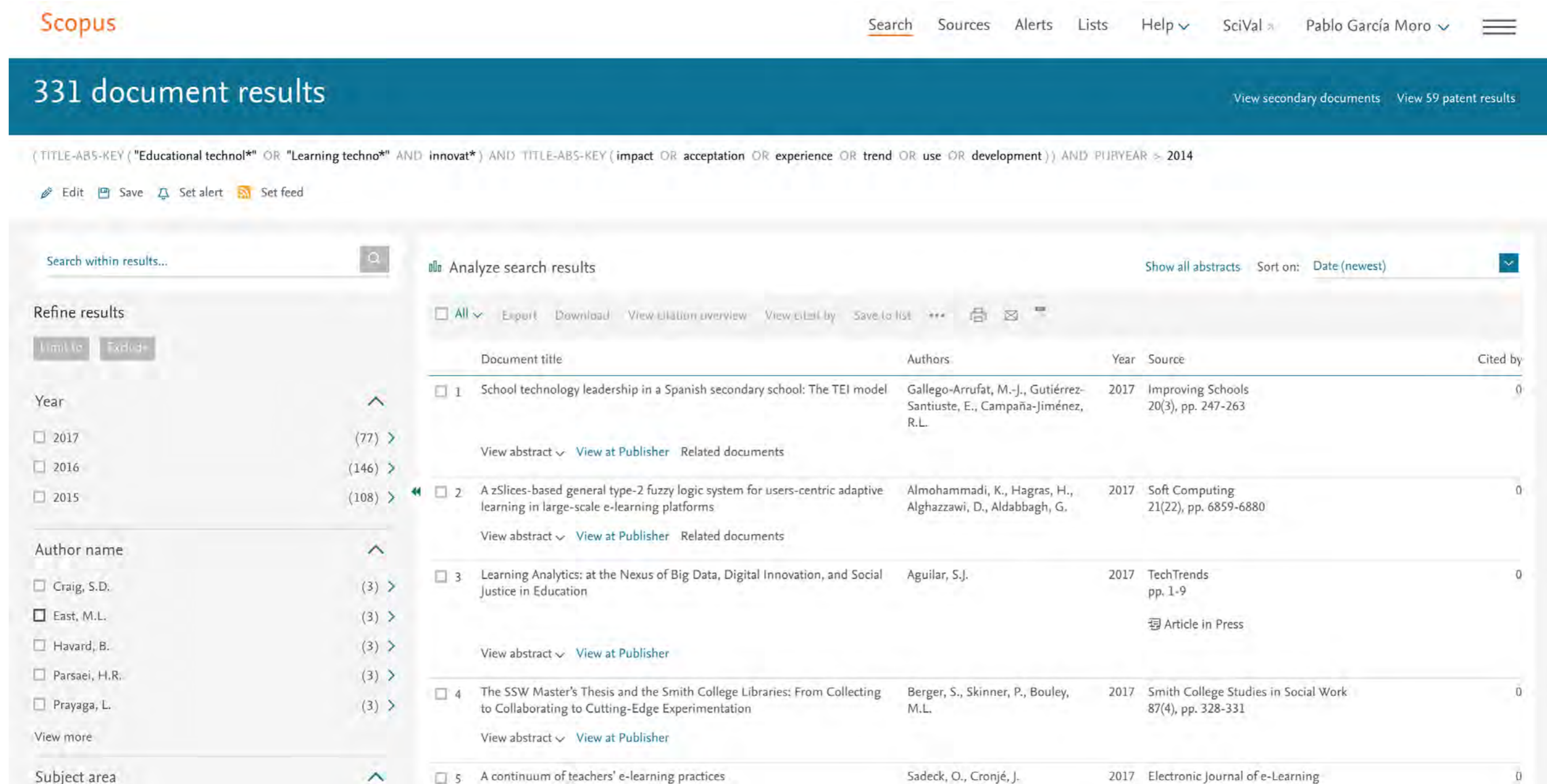
Document type

Article ▾

Reset form Search Q

# Review process

- Search is done in Scopus

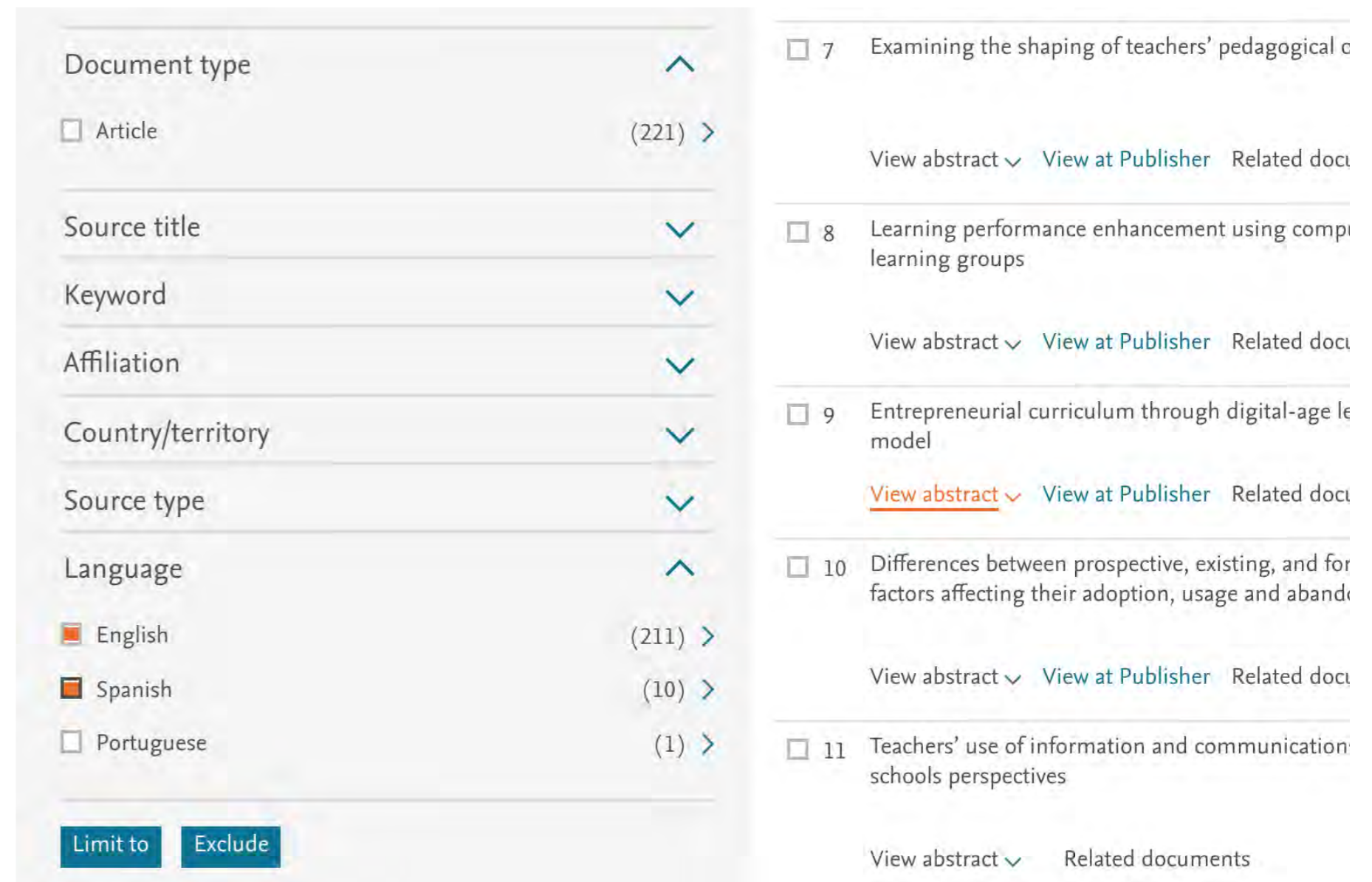


The screenshot shows the Scopus search results interface. At the top, the Scopus logo is on the left, and navigation links for Search, Sources, Alerts, Lists, Help, SciVal, and user profile (Pablo García Moro) are on the right. A blue banner indicates "331 document results" with links to "View secondary documents" and "View 59 patent results". Below the banner, the search query is displayed: `( TITLE-ABS-KEY ( "Educational technol*" OR "Learning techno*" AND innovat* ) AND TITLE-ABS-KEY ( impact OR acceptance OR experience OR trend OR use OR development ) ) AND PUBYEAR >= 2014`. Action buttons for Edit, Save, Set alert, and Set feed are visible. The main results area includes a search bar, "Analyze search results" options, and a table of results. The table has columns for Document title, Authors, Year, Source, and Cited by. Five results are shown, with the second result selected.

	Document title	Authors	Year	Source	Cited by
<input type="checkbox"/> 1	School technology leadership in a Spanish secondary school: The TEI model	Gallego-Arrufat, M.-J., Gutiérrez-Santiuste, E., Campaña-Jiménez, R.L.	2017	Improving Schools 20(3), pp. 247-263	0
<input type="checkbox"/> 2	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K., Hagra, H., Alghazzawi, D., Aldabbagh, G.	2017	Soft Computing 21(22), pp. 6859-6880	0
<input type="checkbox"/> 3	Learning Analytics: at the Nexus of Big Data, Digital Innovation, and Social Justice in Education	Aguilar, S.J.	2017	TechTrends pp. 1-9 Article in Press	0
<input type="checkbox"/> 4	The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cutting-Edge Experimentation	Berger, S., Skinner, P., Bouley, M.L.	2017	Smith College Studies in Social Work 87(4), pp. 328-331	0
<input type="checkbox"/> 5	A continuum of teachers' e-learning practices	Sadeck, O., Cronjé, J.	2017	Electronic Journal of e-Learning	0

# Review process

- The appropriate refinements are made until the different constraints have been included and the dataset with which you are going to work is available



The screenshot displays a search results page with a left-hand sidebar for filters and a main area for document listings.

**Filters (Left Sidebar):**

- Document type:** Article (221)
- Source title:** (221)
- Keyword:** (221)
- Affiliation:** (221)
- Country/territory:** (221)
- Source type:** (221)
- Language:**
  - English (211)
  - Spanish (10)
  - Portuguese (1)

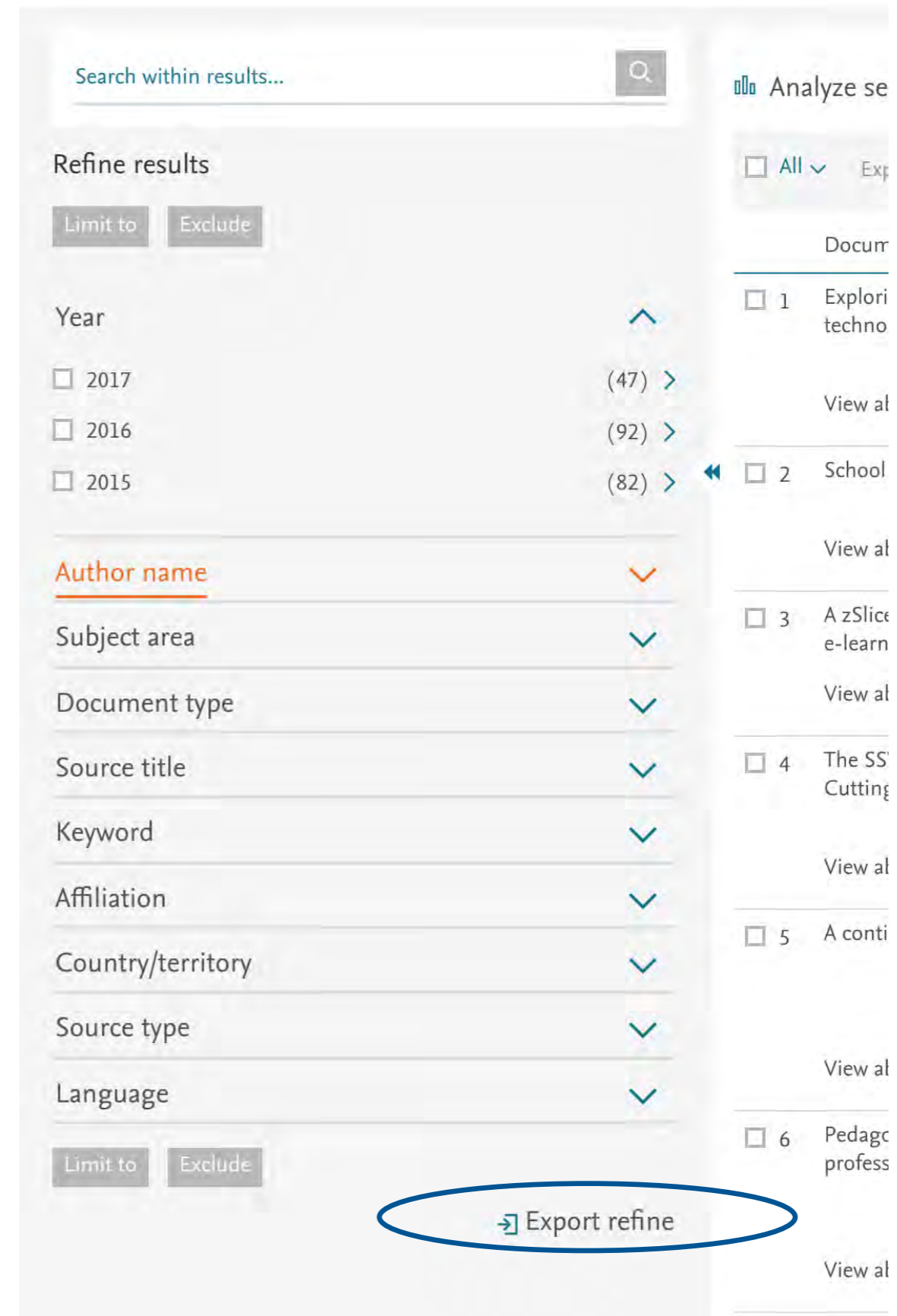
Buttons at the bottom of the filter sidebar: **Limit to** and **Exclude**.

**Document Listings (Main Area):**

- 7** Examining the shaping of teachers' pedagogical c...  
View abstract | View at Publisher | Related docu...
- 8** Learning performance enhancement using comp...  
learning groups  
View abstract | View at Publisher | Related docu...
- 9** Entrepreneurial curriculum through digital-age le...  
model  
**View abstract** | View at Publisher | Related docu...
- 10** Differences between prospective, existing, and for...  
factors affecting their adoption, usage and aband...  
View abstract | View at Publisher | Related docu...
- 11** Teachers' use of information and communication...  
schools perspectives  
View abstract | Related documents

# Review process

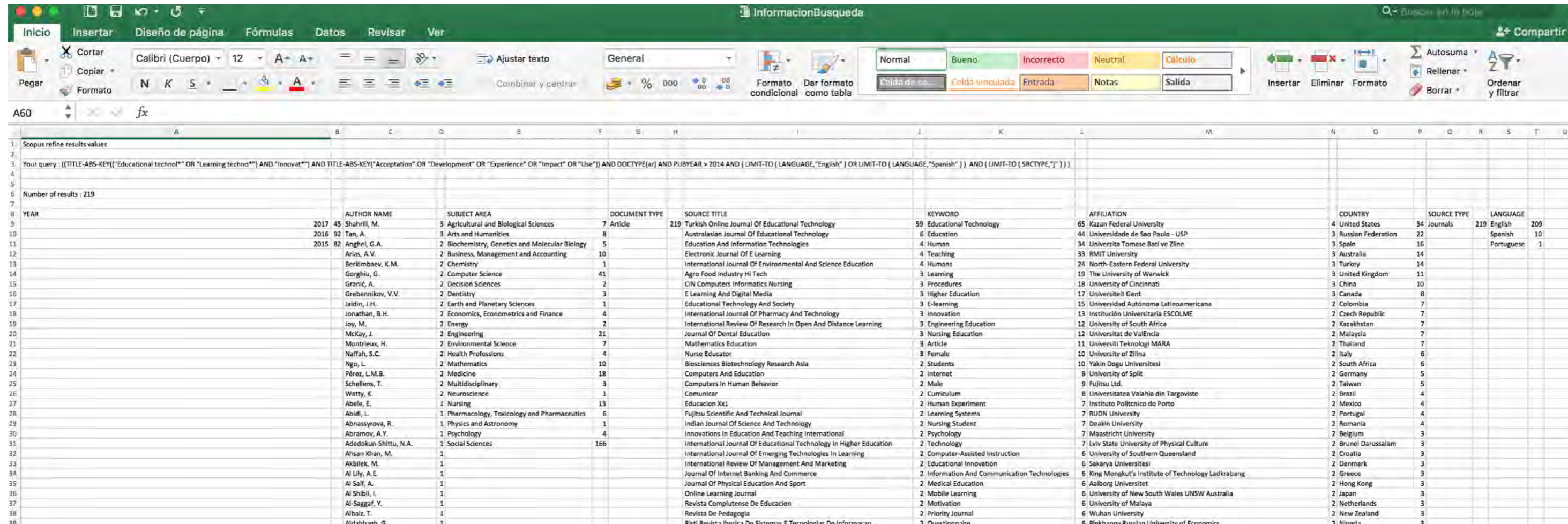
- Once you have the dataset, you can get an overview of the selected dataset in a CSV file



The screenshot shows a search interface with a 'Refine results' sidebar on the left and a list of search results on the right. The sidebar includes a search bar, 'Limit to' and 'Exclude' buttons, and a list of filters: Year (2017: 47, 2016: 92, 2015: 82), Author name, Subject area, Document type, Source title, Keyword, Affiliation, Country/territory, Source type, and Language. The 'Export refine' button at the bottom of the sidebar is circled in blue. The search results on the right show a list of documents with checkboxes and titles like 'Explori techno', 'School', 'A zSlice e-learn', 'The SS Cutting', 'A conti', and 'Pedagc profess'.

# Review process

- Once you have the dataset, you can get an overview of the selected dataset in a CSV file



YEAR	AUTHOR NAME	SUBJECT AREA	DOCUMENT TYPE	SOURCE TITLE	KEYWORD	AFFILIATION	COUNTRY	SOURCE TYPE	LANGUAGE
2017	45 Shahrlil, M.	3 Agricultural and Biological Sciences	7 Article	219 Turkish Online Journal Of Educational Technology	59 Educational Technology	65 Kazan Federal University	4 United States	34 Journals	219 English
2016	92 Tan, A.	3 Arts and Humanities	8	Australasian Journal Of Educational Technology	6 Education	44 Universidade de Sao Paulo - USP	3 Russian Federation	22	209 Spanish
2015	82 Anghel, G.A.	2 Biochemistry, Genetics and Molecular Biology	5	Education And Information Technologies	4 Human	34 Universita Tomase Bati ve Zline	3 Spain	16	1 Portuguese
	Arias, A.V.	2 Business, Management and Accounting	10	Electronic Journal Of E Learning	4 Teaching	33 RMIT University	3 Australia	14	
	Berkimbaev, K.M.	2 Chemistry	1	International Journal Of Environmental And Science Education	4 Humans	24 North-Eastern Federal University	3 Turkey	14	
	Gorghiu, G.	2 Computer Science	41	Agro Food Industry Hi Tech	3 Learning	19 The University of Warwick	3 United Kingdom	11	
	Granic, A.	2 Decision Sciences	2	CIN Computers Informatics Nursing	3 Procedures	18 University of Cincinnati	3 China	10	
	Grebennikov, V.V.	2 Dentistry	3	E Learning And Digital Media	3 Higher Education	17 Universiteit Gent	3 Canada	8	
	Jaidin, J.H.	2 Earth and Planetary Sciences	1	Educational Technology And Society	3 E-learning	15 Universidad Autónoma Latinoamericana	2 Colombia	7	
	Jonathan, B.H.	2 Economics, Econometrics and Finance	4	International Journal Of Pharmacy And Technology	3 Innovation	13 Institución Universitaria ESCOLME	2 Czech Republic	7	
	Joy, M.	2 Energy	2	International Review Of Research In Open And Distance Learning	3 Engineering Education	12 University of South Africa	2 Kazakhstan	7	
	McKay, J.	2 Engineering	21	Journal Of Dental Education	3 Nursing Education	12 Universitat de València	2 Malaysia	7	
	Montrieux, H.	2 Environmental Science	7	Mathematics Education	3 Article	11 Universiti Teknologi MARA	2 Thailand	7	
	Naffah, S.C.	2 Health Professions	4	Nurse Educator	3 Female	10 University of Zilina	2 Italy	6	
	Ngo, L.	2 Mathematics	10	Biosciences Biotechnology Research Asia	2 Students	10 Yakin Dogu Universitesi	2 South Africa	6	
	Pérez, L.M.B.	2 Medicine	18	Computers And Education	2 Internet	9 University of Split	2 Germany	5	
	Schellens, T.	2 Multidisciplinary	3	Computers in Human Behavior	2 Male	9 Fujitsu Ltd.	2 Taiwan	5	
	Watty, K.	2 Neuroscience	1	Comunicar	2 Curriculum	8 Universitatea Valahia din Targoviste	2 Brazil	4	
	Abele, E.	1 Nursing	13	Educacion Xxi	2 Human Experiment	7 Instituto Politecnico do Porto	2 Mexico	4	
	Abidi, L.	1 Pharmacology, Toxicology and Pharmaceutics	6	Fujitsu Scientific And Technical Journal	2 Learning Systems	7 RUDN University	2 Portugal	4	
	Abnassyrova, R.	1 Physics and Astronomy	1	Indian Journal Of Science And Technology	2 Nursing Student	7 Deakin University	2 Romania	4	
	Abramov, A.Y.	1 Psychology	4	Innovations In Education And Teaching International	2 Psychology	7 Maastricht University	2 Belgium	3	
	Adedokun-Shittu, N.A.	1 Social Sciences	166	International Journal Of Educational Technology In Higher Education	2 Technology	7 Liv State University of Physical Culture	2 Brunei Darussalam	3	
	Ahsan Khan, M.	1	1	International Journal Of Emerging Technologies In Learning	2 Computer-Assisted Instruction	6 University of Southern Queensland	2 Croatia	3	
	Akilek, M.	1	1	International Review Of Management And Marketing	2 Educational Innovation	6 Sakarya Universitesi	2 Denmark	3	
	Al Lily, A.E.	1	1	Journal Of Internet Banking And Commerce	2 Information And Communication Technologies	6 King Mongkut's Institute of Technology Ladkrabang	2 Greece	3	
	Al Salf, A.	1	1	Journal Of Physical Education And Sport	2 Medical Education	6 Aalborg Universitet	2 Hong Kong	3	
	Al Shibli, I.	1	1	Online Learning Journal	2 Mobile Learning	6 University of New South Wales UNSW Australia	2 Japan	3	
	Al-Saggaf, Y.	1	1	Revista Complutense De Educacion	2 Motivation	6 University of Malaya	2 Netherlands	3	
	Albaiz, T.	1	1	Revista De Pedagogia	2 Priority Journal	6 Wuhan University	2 New Zealand	3	
	Alshbani, G.	1	1	Biological Sciences E-Learning And Information	2 Questionnaire	6 Bilkent University Faculty of Education	2 Korea	3	

# Review process

- Once you have the dataset, you select the records

Edit Save Set alert Set feed

Search within results...

Analyze search results Show all abstracts Sort on: Date (newest)

All Export Download View citation overview View cited by Save to list

	Document title	Authors	Year	Source	Cited by
<input checked="" type="checkbox"/>	1 Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technologies in Egypt and United Arab Emirates	El Alfy, S., Gómez, J.M., Ivanov, D.	2017	Education and Information Technologies 22(5), pp. 2605-2627	0
	View abstract View at Publisher Related documents				
<input checked="" type="checkbox"/>	2 School technology leadership in a Spanish secondary school: The TEI model	Gallego-Arrufat, M.-J., Gutiérrez-Santiuste, E., Campaña-Jiménez, R.L.	2017	Improving Schools 20(3), pp. 247-263	0
	View abstract View at Publisher Related documents				
<input checked="" type="checkbox"/>	3 A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K., Hagra, H., Alghazzawi, D., Aldabbagh, G.	2017	Soft Computing 21(22), pp. 6859-6880	0
	View abstract View at Publisher Related documents				
<input checked="" type="checkbox"/>	4 The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cutting-Edge Experimentation	Berger, S., Skinner, P., Bouley, M.L.	2017	Smith College Studies in Social Work 87(4), pp. 328-331	0
	View abstract View at Publisher				
<input checked="" type="checkbox"/>	5 A continuum of teachers' e-learning practices	Sadeck, O., Cronjé, J.	2017	Electronic Journal of e-Learning 15(5), pp. 395-408 <a href="#">Open Access</a>	0

Refine results

Limit to Exclude

Year

2017 (47) >

2016 (92) >

2015 (82) >

Author name

Subject area

Document type

Source title

Keyword

Affiliation

Country/territory

Source type

# Review process

- They are exported to work with them in the format you want: Bibtex, RIS, CSV, etc.

Export document settings ×

You have chosen to export 221 documents

Select your method of export

MENDELEY
  RefWorks
  RIS Format (EndNote, Reference Manager)
  CSV (Excel)
  BibTeX
  Text (ASCII in HTML)

What information do you want to export?

Customize export

<input checked="" type="checkbox"/> Citation information	<input type="checkbox"/> Bibliographical information	<input checked="" type="checkbox"/> Abstract and Keywords	<input type="checkbox"/> Funding Details	<input type="checkbox"/> Other information
<input checked="" type="checkbox"/> Author(s)	<input type="checkbox"/> Affiliations	<input checked="" type="checkbox"/> Abstract	<input type="checkbox"/> Number	<input type="checkbox"/> Tradenames and Manufacturers
<input checked="" type="checkbox"/> Document title	<input type="checkbox"/> Serial identifiers (e.g. ISSN)	<input checked="" type="checkbox"/> Author Keywords	<input type="checkbox"/> Acronym	<input type="checkbox"/> Accession numbers and Chemicals
<input checked="" type="checkbox"/> Year	<input type="checkbox"/> PubMed ID	<input checked="" type="checkbox"/> Index Keywords	<input type="checkbox"/> Sponsor	<input type="checkbox"/> Conference information
<input checked="" type="checkbox"/> EID	<input type="checkbox"/> Publisher		<input type="checkbox"/> Funding text	<input type="checkbox"/> Include references
<input checked="" type="checkbox"/> Source title	<input type="checkbox"/> Editor(s)			
<input checked="" type="checkbox"/> Volume, Issue, Pages	<input type="checkbox"/> Language of Original Document			
<input checked="" type="checkbox"/> Citation count	<input type="checkbox"/> Correspondence Address			
<input checked="" type="checkbox"/> Source and Document Type	<input type="checkbox"/> Abbreviated Source Title			
<input checked="" type="checkbox"/> DOI				

Cancel Export

# Review process

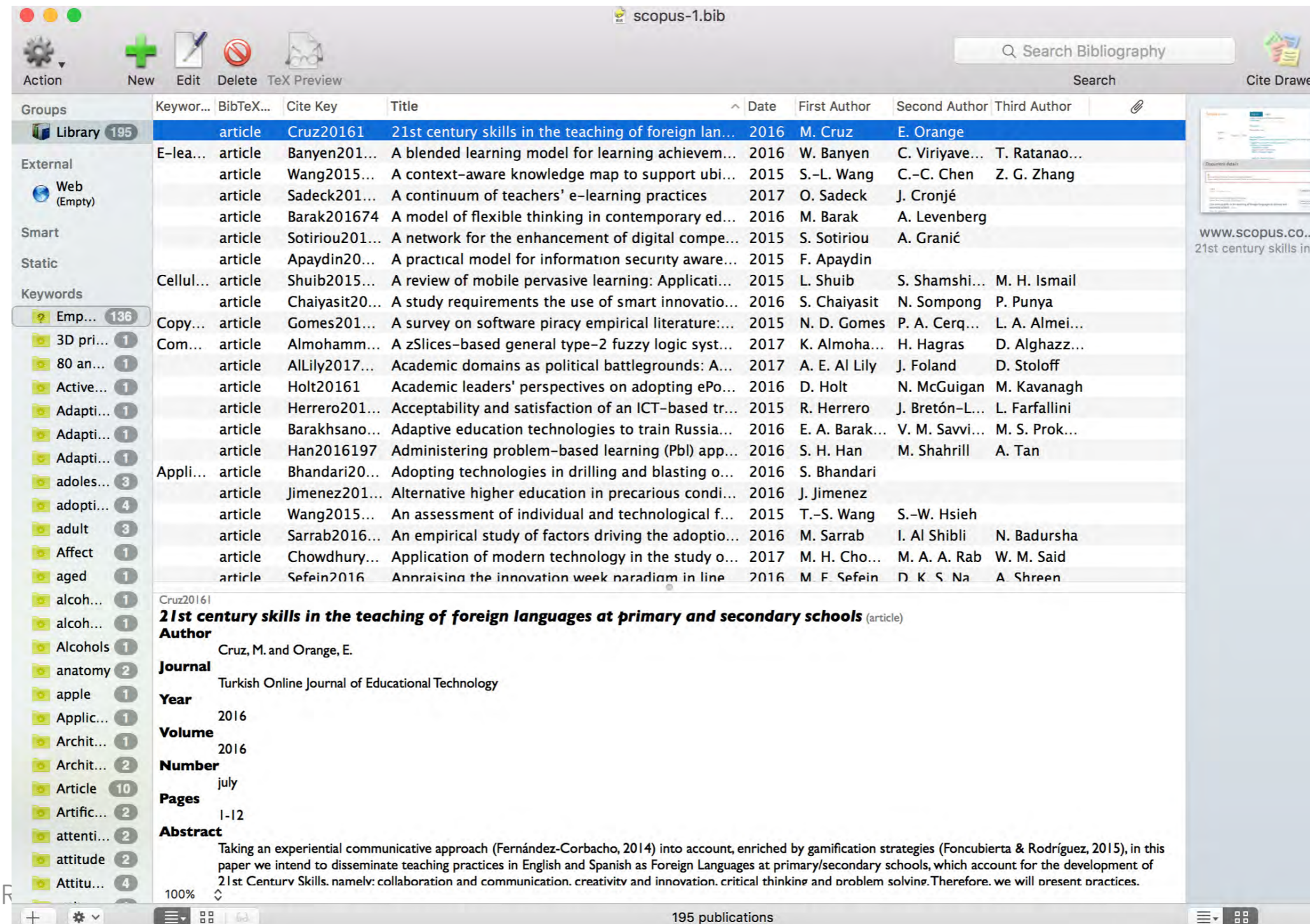
- You already have the dataset to work with

Authors	Title	Year	Source title	Volume	Issue	Art. No.	Page start	Page end	Page count	Cited by	DOI
El Alfy S., Gómez J.M., Ivanov D.	Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning	2017	Education and Information Technologies	22		5	2605	2627			10.1007
Gallego-Arrufat M.-J., Gutiérrez-Santiuste E., Campaña-Jiménez R.L.	School technology leadership in a Spanish secondary school: The TEI model	2017	Improving Schools	20		3	247	263			10.1177
Almohammadi K., Hagraas H., Alghazzawi D., Aldabbagh G.	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e	2017	Soft Computing	21		22	6859	6880			10.1007
Berger S., Skinner P., Bouley M.L.	The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cuttir	2017	Smith College Studies in Social Work	87		4	328	331			10.1080
Sadeck O., Cronjé J.	A continuum of teachers' e-learning practices	2017	Electronic Journal of e-Learning	15		5	395	408			
Myroslava D., Olha R., Iryna H., Victoria I.	Pedagogical conditions of introduction of innovative educational technologies into the professional	2017	Journal of Physical Education and Sport	17		3	171	1113	1119		10.7752
Prestridge S.	Examining the shaping of teachers' pedagogical orientation for the use of technology	2017	Technology, Pedagogy and Education	26		4	367	381		1	10.1080
Wang Y.-h., Liao H.-C.	Learning performance enhancement using computer-assisted language learning by collaborative le	2017	Symmetry	9		8	141				10.3390
Fleacă E.	Entrepreneurial curriculum through digital-age learning in higher education - A process-based mod	2017	TEM Journal	6		3	591	598			10.1842
Šumak B., Pušnik M., Heričko M., Šorgo A.	Differences between prospective, existing, and former users of interactive whiteboards on externa	2017	Computers in Human Behavior	72			733	756			10.1016
Haji S.A.	Teachers' use of information and communications technology in education: Cameroon secondary s	2017	Turkish Online Journal of Educational Technology	16		3	146	152			
Avci Yücel Ü.	Perceptions of pedagogical formation students about Web 2.0 tools and educational practices	2017	Education and Information Technologies	22		4	1571	1585			10.1007
Jain N.S., Schwarzkopf R., Sclaro J.A.	Video Review as a Tool to Improve Orthopedic Residents' Performance of Closed Manipulative Red	2017	Journal of Surgical Education	74		4	663	667			10.1016
Giannakos M.N., Divitini M., Iversen O.S.	Entertainment, engagement, and education: Foundations and developments in digital and physical	2017	Entertainment Computing	21			77	81			10.1016
Sutton K.K., DeSantis J.	Beyond change blindness: embracing the technology revolution in higher education	2017	Innovations in Education and Teaching International	54		3	223	228			10.1080
Li Y.	Study of educational technology innovation based on the perspective of big data	2017	Agro Food Industry Hi-Tech	28		3	813	816			
Botha-Ravuse C., Bignaut S.	Does the early adopter catch the worm or choke on it? A reflective journey of the challenges of tec	2017	Education for Health: Change in Learning and Practice	30		2	176	181			10.4103
Osakwe J., Dlodlo N., Jere N.	Where learners' and teachers' perceptions on mobile learning meet: A case of Namibian secondary	2017	Technology in Society	49			16	30			10.1016
Chowdhury M.H., Rab M.A.A., Said W.M., Ghazali N.M., Mohamed Y., Toure A.K.	Application of modern technology in the study of hadith and its sciences: A case study	2017	Advanced Science Letters	23		5	4773	4776			10.1166
Zhang F.	The study on the interactive teaching mode of college English based on mobile internet environme	2017	Agro Food Industry Hi-Tech	28		3	1413	1415			
Izard S.G., Juanes Méndez J.A., Palomera P.R.	Virtual Reality Educational Tool for Human Anatomy	2017	Journal of Medical Systems	41		5	76				10.1007
Mbati L.	Creating awareness around rhizomatic principles in mlearning: A means to improving practice	2017	International Journal of Mobile and Blended Learning	9		2	74	87			10.4018
Critelli F., Lewis L., Méndez-López A.	Educating for an Inclusive World: Lessons Learned From A Globally Networked Human Rights and C	2017	Journal of Teaching in Social Work	37		2	121	137			10.1080
Ros M., Trives J.-V., Lonjon N.	From stereoscopic recording to virtual reality headsets: Designing a new way to learn surgery	2017	Neurochirurgie	63		1	1	5		1	10.1016
Kotcherlakota S., Kupzyk K.A., Rejda P.	Years of experience as a predictor of nurse faculty technology use	2017	Journal of Nursing Education	56		2	115	119			10.3928
Yamakage Y., Okamoto S.	Toward AI for human beings: Human centric AI Zinrai	2017	Fujitsu Scientific and Technical Journal	53		1	38	44			
Squire K.	Innovation in times of uncertainty	2017	On the Horizon	25		4	293	308			10.1108
Dudin M.N., Lyasnikov N.V., Makarov O.N., Maslennikova O.A., Grebennikov V.V.	The fostering of motivation for innovative activity in future agriculture specialists as a pedagogical	2017	Espacios	38		40	10				
Bhagat K.K., Spector J.M.	Formative assessment in complex problem-solving domains: The emerging role of assessment tech	2017	Educational Technology and Society	20		4	312	317			
Pyrini N., Varonis O.J., Varonis E.M.	The Open Wings project: Transforming students' perceptions of self and society through the devel	2017	International Journal of Information and Learning Technology	34		2	83	101			10.1108
Liu J., Fang H., Zhang S.	Innovative application of modern educational technology in national defense education in Colleges	2017	Agro Food Industry Hi-Tech	28		1	137	140			
Masalimova A.R., Levina E.Y., Platonova R.I., Yakubenko K.Y., Mamitova N.V., Arzumanova L.L., Gre	Cognitive simulation as integrated innovative technology in teaching of social and humanitarian dis	2017	Eurasia Journal of Mathematics, Science and Technology Education	13		8	4915	4928		11	10.1297
Clark A., Glazer G., Edwards C., Pryse Y.	Transforming nursing education with apple technology	2017	Nurse Educator	42		2	91	94			10.1097
Cartner H.C., Hallas J.L.	Challenging teachers' pedagogic practice and assumptions about social media	2017	Online Learning Journal	21		2				1	10.2405
Kowitlawakul Y., Chan M.F., Tan S.S.L., Soong A.S.K., Chan S.W.C.	Development of an e-Learning research module using multimedia instruction approach	2017	CIN - Computers Informatics Nursing	35		3	158	166			10.1097
Gómez-Galán J., Pérez-Parras J.	Lights and shadows of the mooc phenomenon: Do they represent a real educational innovation? [L	2017	Revista de Pedagogía	38		102	237	259			
Reid P.	Supporting instructors in overcoming self-efficacy and background barriers to adoption	2017	Education and Information Technologies	22		1	369	382		1	10.1007
Zhang M., Yin S., Luo M., Yan W.	Learner control, user characteristics, platform difference, and their role in adoption intention for M	2017	Australasian Journal of Educational Technology	33		1	114	133			10.1474
Del Barrío M.M., Martins V.F.	Foreign-language teaching technologies: A positive contribution to Brazil's education challenges IT	2017	Calidescopia	15		1	141	154			10.4018

## Dataset in CSV

# Review process

- You already have the dataset to work with



The screenshot shows a Zotero library window titled 'scopus-1.bib'. The main pane displays a list of bibliographic entries with columns for Groups, Keyword, BibTeX ID, Cite Key, Title, Date, First Author, Second Author, and Third Author. The entry for Cruz20161 is selected and highlighted in blue.

Groups	Keyword	BibTeX...	Cite Key	Title	Date	First Author	Second Author	Third Author
Library 195	article	Cruz20161		21st century skills in the teaching of foreign lan...	2016	M. Cruz	E. Orange	
External								
Web (Empty)								
Smart								
Static								
Keywords								
Emp... 136								
3D pri... 1								
80 an... 1								
Active... 1								
Adapti... 1								
Adapti... 1								
Adapti... 1								
adoles... 3								
adopti... 4								
adult 3								
Affect 1								
aged 1								
alcoh... 1								
alcoh... 1								
Alcohols 1								
anatomy 2								
apple 1								
Applic... 1								
Archit... 1								
Archit... 2								
Article 10								
Artific... 2								
attenti... 2								
attitude 2								
Attitu... 4								

The detailed view of the selected entry (Cruz20161) shows the following information:

- Title:** 21st century skills in the teaching of foreign languages at primary and secondary schools (article)
- Author:** Cruz, M. and Orange, E.
- Journal:** Turkish Online Journal of Educational Technology
- Year:** 2016
- Volume:** 2016
- Number:** july
- Pages:** 1-12
- Abstract:** Taking an experiential communicative approach (Fernández-Corbacho, 2014) into account, enriched by gamification strategies (Foncubierta & Rodríguez, 2015), in this paper we intend to disseminate teaching practices in English and Spanish as Foreign Languages at primary/secondary schools, which account for the development of 21st Century Skills. namely: collaboration and communication. creativty and innovation. critical thinkinø and problem solvine. Therefore. we will present practices.

Dataset in BibTeX

# Review process

- The search equation is saved in Scopus

fgarcia04 / [Desarrollo y uso de la tecnología en educación](#) Review settings

Review Planning **Conducting** Reporting

1. Search 2. Import Studies 3. Study Selection 4. Quality Assessment 5. Data Extraction 6. Data Analysis

### Search Strings ?

**i** Add digital source-specific search strings. Use this space to save all search string formats used during the research.

Base String ISI Web of Science **Scopus**



```
( TITLE-ABS-KEY ( "educational technol*" ) OR TITLE-ABS-KEY ( "learning technol*" ) AND TITLE-ABS-KEY ( innovat* ) AND TITLE-ABS-KEY ( impact OR acceptance OR experience OR trend OR use OR development ) ) AND DOCTYPE ( ar ) AND PUBYEAR > 2015 AND ( LIMIT-TO ( LANGUAGE , "English" ) OR LIMIT-TO ( LANGUAGE , "Spanish" ) )
```

Save Import Base String Remove Scopus

+ Add source-specific search string

# Review of the articles

- Studies are imported


*Parsifal* Blog About Help fgarcia04  

fgarcia04 / **Desarrollo y uso de la tecnología en educación** [Review settings](#)

Review Planning **Conducting** Reporting

1. Search 2. Import Studies 3. Study Selection 4. Quality Assessment 5. Data Extraction 6. Data Analysis

Import Studies	
Source	Imported Studies
ISI Web of Science	196
Scopus	219

 Import ▾

- BibTeX file (.bib, .bibtex)
- Paste BibTeX content

# Review of the articles

- Duplicates are marked

*Parsifal* Blog About Help fgarcia04 [Settings] [Share]

fgarcia04 / **Desarrollo y uso de la tecnología en educación** [Review settings]

Review Planning **Conducting** Reporting

1. Search 2. Import Studies 3. Study Selection 4. Quality Assessment 5. Data Extraction 6. Data Analysis

### Study Selection

All Sources ISI Web of Science Scopus

[Find Duplicates] [Export Articles]

Action: Select... Go 0 of 415 selected

Show:  All  Accepted  Rejected  Unclassified  Duplicated

<input type="checkbox"/>	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
<input type="checkbox"/>	EIAlfy20172605	Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technologies in Egypt and United Arab Emirates	El Alfy, S. and Gómez, J.M. and Ivanov, D.	Education and Information Technologies	2017	fgarcia04	25 Nov 2017 18:28:07	Duplicated
<input type="checkbox"/>	Almohammadi20176859	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K. and Hagraas, H. and Alghazzawi, D. and Aldabbagh, G.	Soft Computing	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified
<input type="checkbox"/>	Berger2017328	The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cutting-Edge	Berger, S. and Skinner, P. and Bouley, M.L.	Smith College Studies in Social Work	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified

# Review of the articles

- Duplicates are selected and removed

## Study Selection

All Sources

ISI Web of Science

Scopus

Find Duplicates

Export Articles

Action: Remove selected

Go

82 of 82 selected

Show:  All  Accepted  Rejected  Unclassified  Duplicated

<input checked="" type="checkbox"/>	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
<input checked="" type="checkbox"/>	EIAIfy20172605	Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technologies in Egypt and United Arab Emirates	El Alfy, S. and Gómez, J.M. and Ivanov, D.	Education and Information Technologies	2017	fgarcia04	25 Nov 2017 18:28:07	Duplicated
<input checked="" type="checkbox"/>	Jain2017663	Video Review as a Tool to Improve Orthopedic Residents' Performance of Closed	Jain, N.S. and Schwarzkopf, R. and Scolaro, J.A.	Journal of Surgical Education	2017	fgarcia04	25 Nov 2017 18:28:07	Duplicated

# Review of the articles

- The selected articles are individually reviewed to accept or reject them

*Parsifal* Blog About Help fgarcia04 | ⚙️ ↗️

fgarcia04 / [Desarrollo y uso de la tecnología en educación](#) ⚙️ Review settings

Review
Planning
Conducting
Reporting

1. Search
2. Import Studies
3. Study Selection
4. Quality Assessment
5. Data Extraction
6. Data Analysis

### Study Selection

All Sources
ISI Web of Science
Scopus

🔍 Find Duplicates
📄 Export Articles

Action: Remove selected Go 0 of 333 selected

Show:  All  Accepted  Rejected  Unclassified  Duplicated

<input type="checkbox"/>	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
<input type="checkbox"/>	Almohammadi20176859	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K. and Hagraas, H. and Alghazzawi, D. and Aldabbagh, G.	Soft Computing	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified
<input type="checkbox"/>	Berger2017328	The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cutting-Edge Experimentation	Berger, S. and Skinner, P. and Bouley, M.L.	Smith College Studies in Social Work	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified
<input type="checkbox"/>	Sadeck2017395	A continuum of teachers' e-learning practices	Sadeck, O. and Cronjé, J.	Electronic Journal of e-Learning	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified
<input type="checkbox"/>	Myroslava20171113	Pedagogical conditions of introduction of innovative educational	Myroslava, D. and Olha, R. and Iryna, H. and Victoria, I.	Journal of Physical Education and Sport	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified

# Review of the articles

- Example of acceptance

Article Details (1/333)
✕

Article successfully saved!
✕

Details
Comments
[External Link](#)

**Status**

Accepted

**Selection Criteria**

The paper presents an experience or study with tested results

**Title**

A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms

**Abstract**

uncertainty could affect these views, including how accurately the proposed adaptive educational methods actually assess student responses and the corresponding uncertainties associated with how students receive and comprehend the resulting instruction. E-learning environments contain high levels of linguistic uncertainties, whereby students can interpret and act on the same terms, words, or methods (e.g., course difficulty, length of study time, or preferred learning style) in various ways according to varying levels of motivation, pre-knowledge, cognition, and future plans. Thus, one adaptive instructional model does not fit the needs of all students. Being the instruction model on determining learners' interactions within the learning environment is interpretable and easily read.

**Year**

2017

**Author**

Almohammadi, K. and Hagra, H. and Alghazzawi, D. and Aldabbagh, G.

**Keywords**

Computational linguistics; Computer aided instruction; Computer circuits; Digital storage; Education; Fuzzy logic; Learning systems

Automatically save the status on change and move next
 

Previous
Next
Close
Save

slava20171113	Pedagogical conditions of introduction of	Myroslava, D. and Olha, R. and Iryna, H. and Victoria, I.	Journal of Physical Education and Sport	2017	fgarcia04	25 Nov 2017 18:28:07	Unclas
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# Review of the articles

- Example of rejection

### Article Details (2/333)

Article successfully saved!

Details **Comments** [External Link](#)

**Status** Rejected **Selection Criteria** Paper does not present an experience or study with tested resu

**Title**  
The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cutting-Edge Experimentation

**Abstract**  
Smith College is one of a handful of liberal arts colleges to offer a master's degree in social work. The Smith College School for Social Work (SCSSW)'s thesis requirement has had a major impact on the Smith College Libraries over the years, as the library role shifted from simply collecting books and journals in support of SCSSW—and warehousing the SCSSW thesis output—to developing a large array of services and teaching practices in support of the program. This reflection piece will detail the evolution of these services, practices, and support; it will also illustrate several ways the libraries used SCSSW as the proverbial “guinea pig” to test new services,

**Year**  
2017

**Author**  
Berger, S. and Skinner, P. and Bouley, M.L.

**Keywords**

Automatically save the status on change and move next

[Previous](#) [Next](#) [Close](#) [Save](#)

# Review of the articles

- Progress is reflected in the dashboard

*Parsifal* Blog About Help fgarcia04 ⚙️ ↻

fgarcia04 / [Desarrollo y uso de la tecnología en educación](#) ⚙️ Review settings

Review
Planning
Conducting
Reporting

1. Search
2. Import Studies
3. Study Selection
4. Quality Assessment
5. Data Extraction
6. Data Analysis

### Study Selection

All Sources
ISI Web of Science
Scopus

🔍 Find Duplicates
📄 Export Articles



**Action:** Select... Go 0 of 333 selected

**Show:**  All  Accepted  Rejected  Unclassified  Duplicated

<input type="checkbox"/>	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
<input type="checkbox"/>	Almohammadi20176859	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K. and Hagraas, H. and Alghazzawi, D. and Aldabbagh, G.	Soft Computing	2017	fgarcia04	25 Nov 2017 18:28:07	Accepted
<input type="checkbox"/>	Berger2017328	The SSW Master's Thesis and the Smith College Libraries: From Collecting to Collaborating to Cutting-Edge Experimentation	Berger, S. and Skinner, P. and Bouley, M.L.	Smith College Studies in Social Work	2017	fgarcia04	25 Nov 2017 18:28:07	Rejected
<input type="checkbox"/>	Sadeck2017395	A continuum of	Sadeck, O. and Cronié, J.	Electronic Journal	2017	fgarcia04	25 Nov 2017	Unclassified

# Quality Assurance

- For each of those accepted, the questions defined about the quality of the articles will be answered

*Parsifal* Blog About Help fgarcia04  

fgarcia04 / [Desarrollo y uso de la tecnología en educación](#) [Review settings](#)

Review Planning **Conducting** Reporting

1. Search 2. Import Studies 3. Study Selection **4. Quality Assessment** 5. Data Extraction 6. Data Analysis

## Quality Assessment

[Detailed](#) [Summary](#)

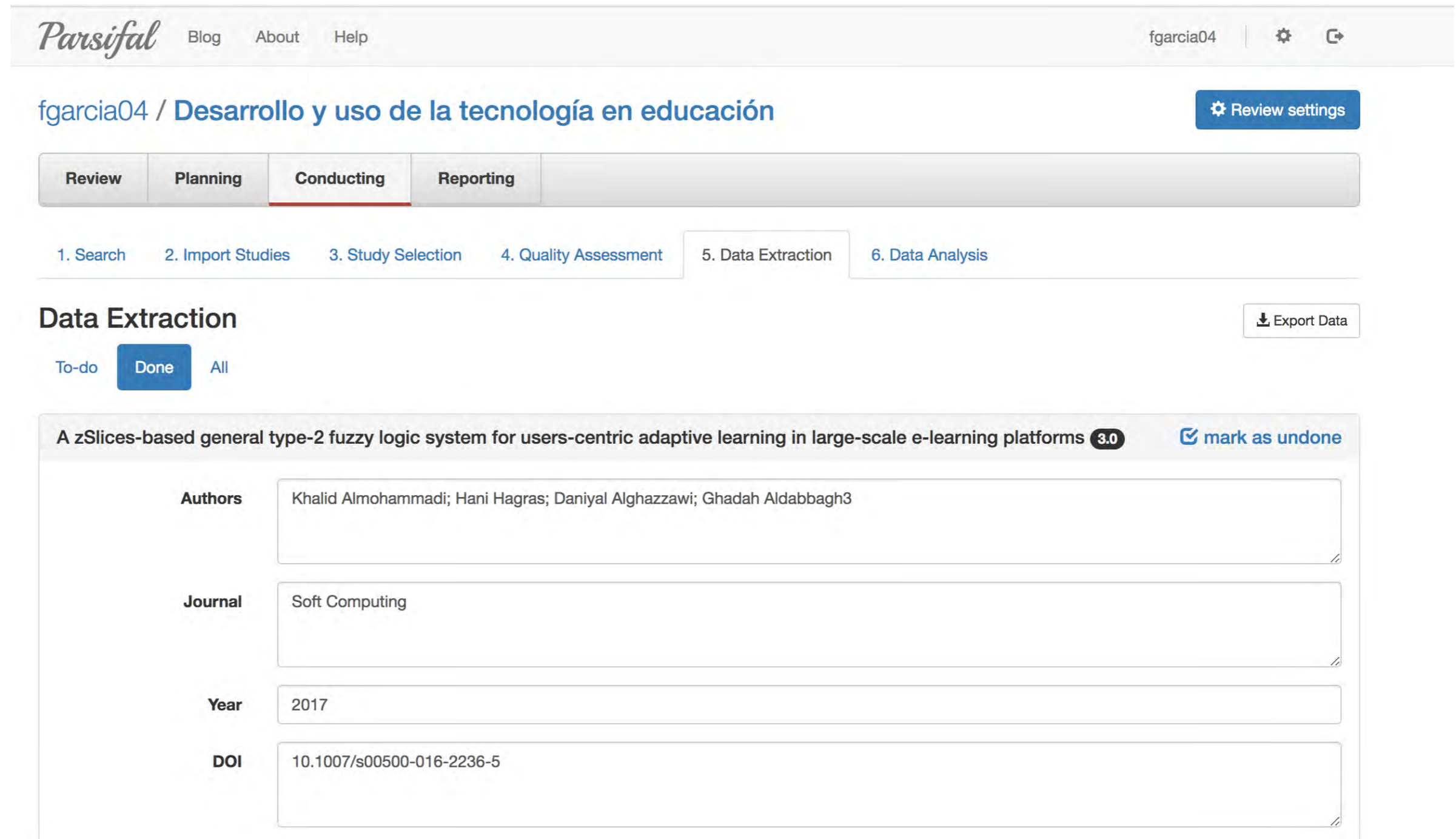
Show:  All  Done  Pending Order by:

To answer the form you may click on the desired answer on the following tables.

A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms (2017)			3.0
Are the research aims clearly specified?	<a href="#">Yes</a>	Partial	No
Is the study designed to achieve these aims?	<a href="#">Yes</a>	Partial	No
Have statistical techniques been used to analyze data?	<a href="#">Yes</a>	Partial	No

# Data extraction

- The fields of the data extraction form are filled in



The screenshot shows the Parsifal web application interface. At the top, there is a navigation bar with the Parsifal logo, links for 'Blog', 'About', and 'Help', and a user profile for 'fgarcia04' with settings and share icons. Below this, the breadcrumb path is 'fgarcia04 / Desarrollo y uso de la tecnología en educación', with a 'Review settings' button. A progress bar shows four stages: 'Review', 'Planning', 'Conducting' (highlighted), and 'Reporting'. Below the progress bar, a sequence of steps is shown: '1. Search', '2. Import Studies', '3. Study Selection', '4. Quality Assessment', '5. Data Extraction' (highlighted), and '6. Data Analysis'. The main section is titled 'Data Extraction' and includes an 'Export Data' button. There are three tabs: 'To-do', 'Done' (selected), and 'All'. The selected tab shows a list of studies. The first study is 'A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms' with a '3.0' rating and a 'mark as undone' link. Below the title, there are four input fields with their respective values: 'Authors' (Khalid Almohammadi; Hani Hagra; Daniyal Alghazzawi; Ghadah Aldabbagh3), 'Journal' (Soft Computing), 'Year' (2017), and 'DOI' (10.1007/s00500-016-2236-5).



<https://www.bibliometrix.org/home/index.php>



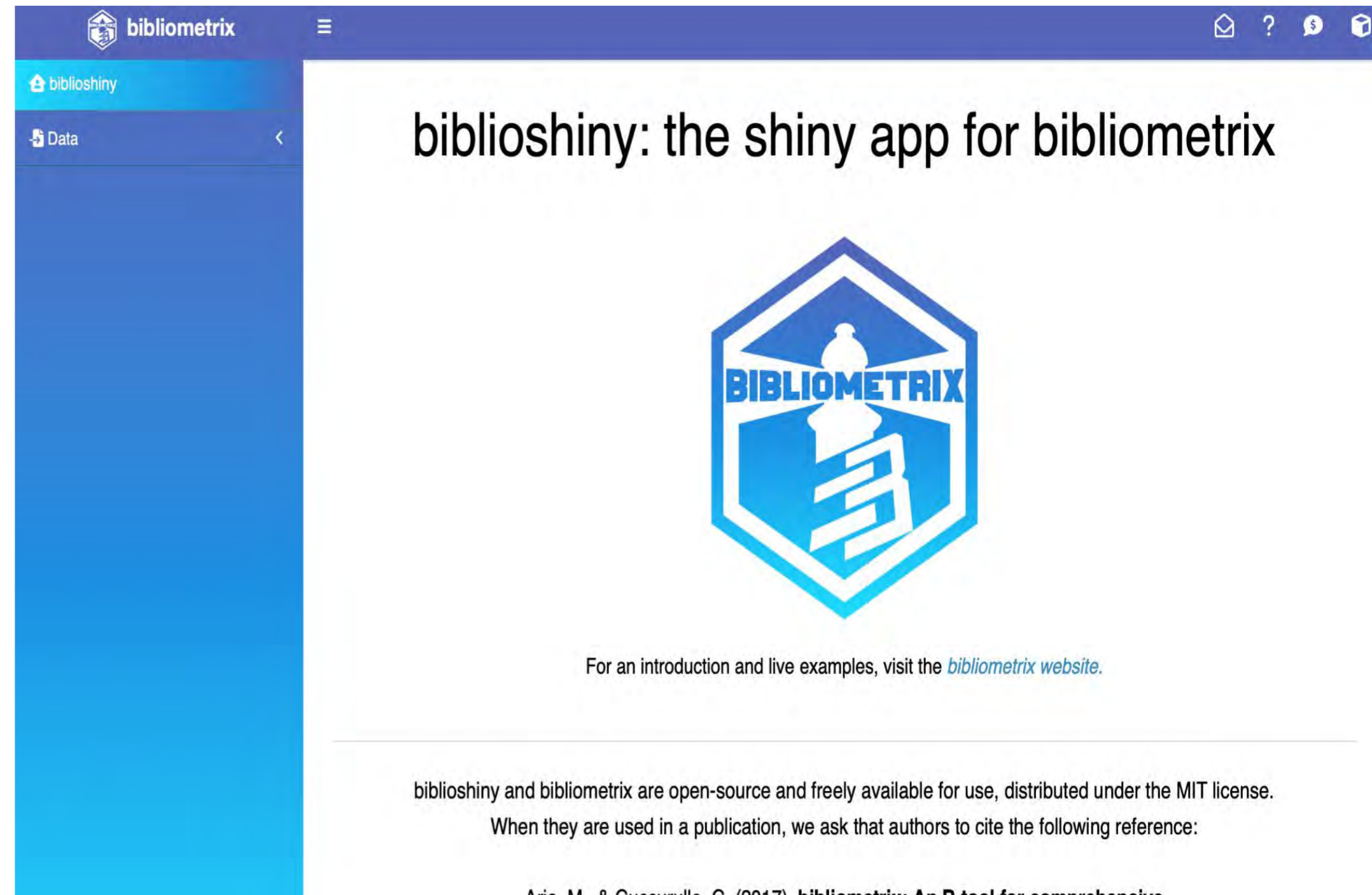
## 8. Bibliometrix

# Bibliometrix


- Bibliometrix (<https://www.bibliometrix.org/home/index.php>) is an open-source tool that allows for an exhaustive analysis of the scientific literature
- It is developed in the R language to be flexible and easy to integrate with other statistical and graphical packages
- As bibliometrics is an ever-changing science, Bibliometrix has the flexibility to be updated and integrated quickly

# Biblioshiny App

- Biblioshiny (<https://d66z.short.gy/rImalz>) [93] is a web application that is included in the bibliometrix package
- Biblioshiny allows researchers to use Bibliometrix without knowledge of R
- It has been developed in the Shiny environment (<https://shiny.posit.co/>)



biblioshiny: the shiny app for bibliometrix

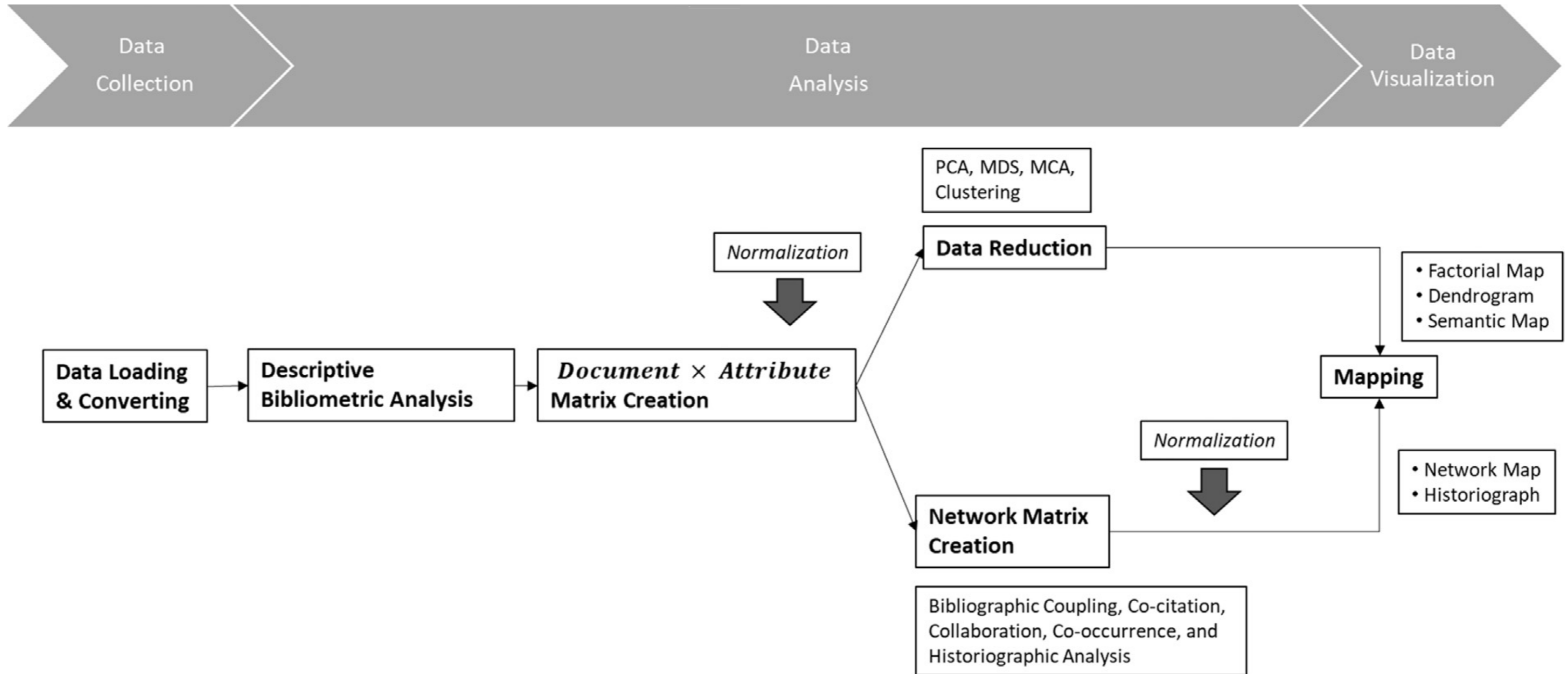


For an introduction and live examples, visit the [bibliometrix website](#).

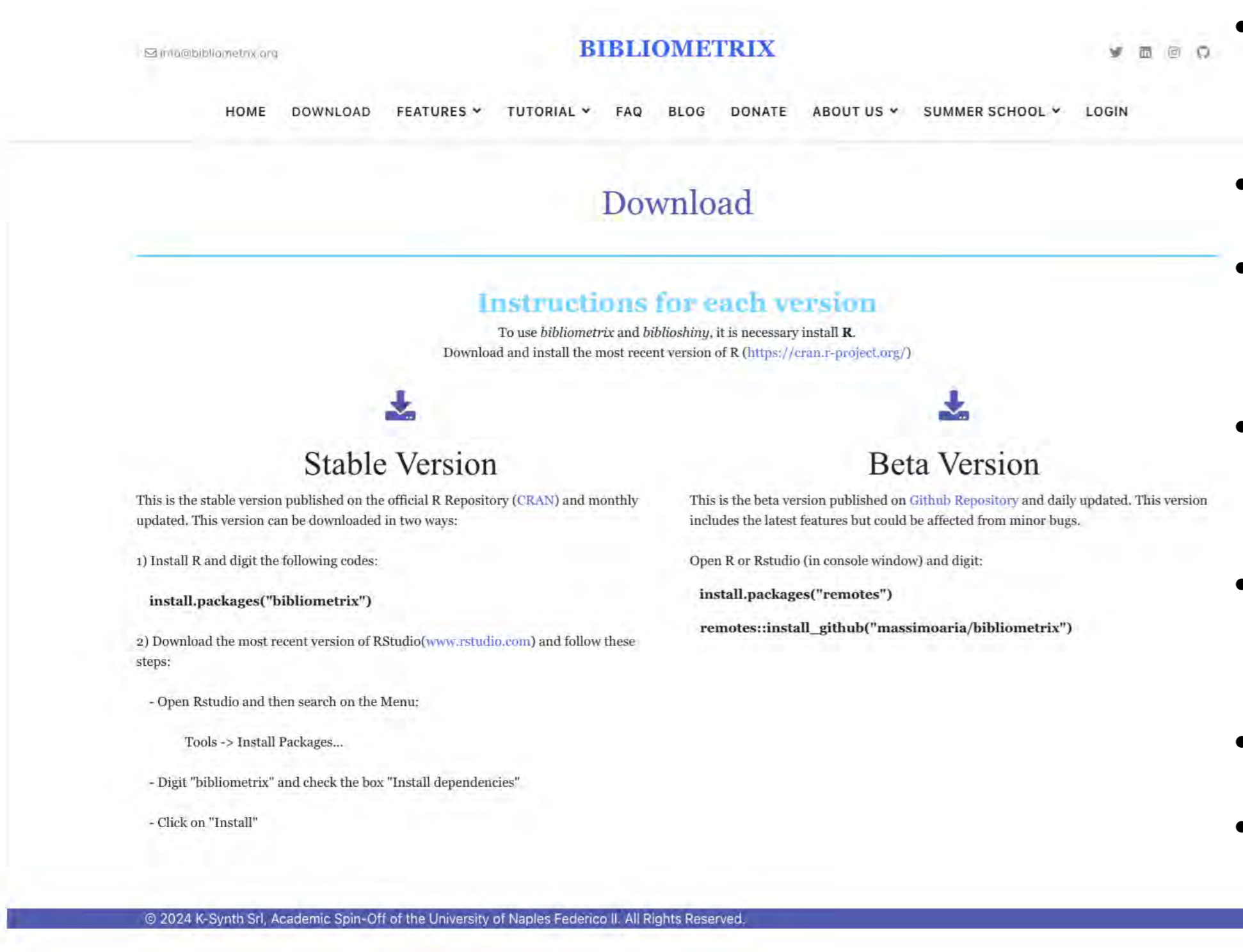
biblioshiny and bibliometrix are open-source and freely available for use, distributed under the MIT license.  
When they are used in a publication, we ask that authors to cite the following reference:

Aric M. & Cuccurullo, C. (2017). bibliometrix: An R tool for comprehensive

# Recommended workflow with Bibliometrix [94]



# Installing Bibliometrix



**BIBLIOMETRIX**

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## Download

### Instructions for each version

To use *bibliometrix* and *biblioshiny*, it is necessary install **R**.  
Download and install the most recent version of R (<https://cran.r-project.org/>)

#### Stable Version

This is the stable version published on the official R Repository (CRAN) and monthly updated. This version can be downloaded in two ways:

- 1) Install R and digit the following codes:  
`install.packages("bibliometrix")`
- 2) Download the most recent version of RStudio([www.rstudio.com](http://www.rstudio.com)) and follow these steps:
  - Open Rstudio and then search on the Menu:  
Tools -> Install Packages...
  - Digit "bibliometrix" and check the box "Install dependencies"
  - Click on "Install"

#### Beta Version

This is the beta version published on Github Repository and daily updated. This version includes the latest features but could be affected from minor bugs.

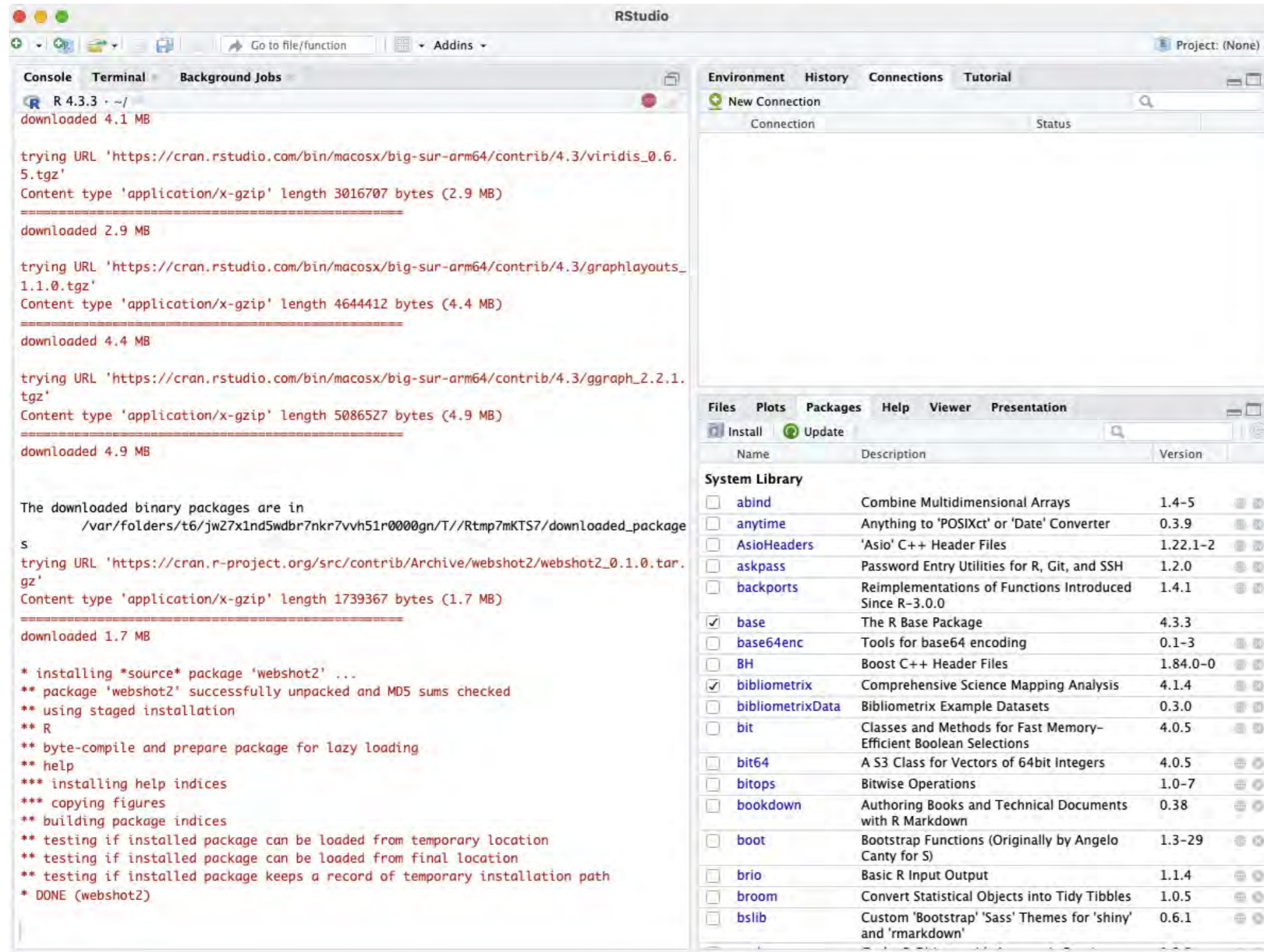
Open R or Rstudio (in console window) and digit:

```
install.packages("remotes")
remotes::install_github("massimoaria/bibliometrix")
```

© 2024 K-Synth Srl, Academic Spin-Off of the University of Naples Federico II. All Rights Reserved.

- Go to <https://www.bibliometrix.org/home/>
- Download the stable version of R
- Download RStudio (<https://www.rstudio.com>)
- Open RStudio and go to the menu  
Tools -> Install Packages
- Search for "bibliometrix" and check  
"Install dependencies"
- Click "Install"
- Install biblioshiny  
`bibliometrix::biblioshiny()`

# Installing Bibliometrix



The screenshot shows the RStudio interface with the console on the left and the package manager on the right. The console displays the following output:

```

R 4.3.3 --/
downloaded 4.1 MB

trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/viridis_0.6.5.tgz'
Content type 'application/x-gzip' length 3016707 bytes (2.9 MB)
=====
downloaded 2.9 MB

trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/graphlayouts_1.1.0.tgz'
Content type 'application/x-gzip' length 4644412 bytes (4.4 MB)
=====
downloaded 4.4 MB

trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/ggraph_2.2.1.tgz'
Content type 'application/x-gzip' length 5086527 bytes (4.9 MB)
=====
downloaded 4.9 MB

The downloaded binary packages are in
  /var/folders/t6/jw27x1nd5wdb7nkr7vvh51r000gn/T/Rtmp7mKTS7/downloaded_packages
trying URL 'https://cran.r-project.org/src/contrib/Archive/webshot2/webshot2_0.1.0.tar.gz'
Content type 'application/x-gzip' length 1739367 bytes (1.7 MB)
=====
downloaded 1.7 MB


* installing *source* package 'webshot2' ...
** package 'webshot2' successfully unpacked and MD5 sums checked
** using staged installation
** R
** byte-compile and prepare package for lazy loading
** help
*** installing help indices
*** copying figures
** building package indices
** testing if installed package can be loaded from temporary location
** testing if installed package can be loaded from final location
** testing if installed package keeps a record of temporary installation path
* DONE (webshot2)
  
```

The package manager on the right shows the following table of installed and available packages:

Name	Description	Version
<b>System Library</b>		
<input type="checkbox"/> abind	Combine Multidimensional Arrays	1.4-5
<input type="checkbox"/> anytime	Anything to 'POSIXct' or 'Date' Converter	0.3.9
<input type="checkbox"/> AsioHeaders	'Asio' C++ Header Files	1.22.1-2
<input type="checkbox"/> askpass	Password Entry Utilities for R, Git, and SSH	1.2.0
<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.4.1
<input checked="" type="checkbox"/> base	The R Base Package	4.3.3
<input type="checkbox"/> base64enc	Tools for base64 encoding	0.1-3
<input type="checkbox"/> BH	Boost C++ Header Files	1.84.0-0
<input checked="" type="checkbox"/> bibliometrix	Comprehensive Science Mapping Analysis	4.1.4
<input type="checkbox"/> bibliometrixData	Bibliometrix Example Datasets	0.3.0
<input type="checkbox"/> bit	Classes and Methods for Fast Memory-Efficient Boolean Selections	4.0.5
<input type="checkbox"/> bit64	A S3 Class for Vectors of 64bit Integers	4.0.5
<input type="checkbox"/> bitops	Bitwise Operations	1.0-7
<input type="checkbox"/> bookdown	Authoring Books and Technical Documents with R Markdown	0.38
<input type="checkbox"/> boot	Bootstrap Functions (Originally by Angelo Canty for S)	1.3-29
<input type="checkbox"/> brio	Basic R Input Output	1.1.4
<input type="checkbox"/> broom	Convert Statistical Objects into Tidy Tibbles	1.0.5
<input type="checkbox"/> bslib	Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'	0.6.1

In the console writes `biblioshiny()`.  
This opens an instance of `biblioshiny` in the browser

# Get started



The screenshot shows the 'bibliometrix' web application interface. The top navigation bar is dark blue with the 'bibliometrix' logo on the left and user information (1.35M) and settings on the right. A left sidebar contains a menu with options: 'biblioshiny', 'Info', 'SEARCH', 'Data', 'APPRAISAL', 'ANALYSIS', 'SYNTHESIS', and 'CONTENT ANALYSIS'. The main content area features the title 'biblioshiny: the shiny app for bibliometrix' and a large blue hexagonal logo with a white silhouette of a person at a computer, with the text 'BIBLIOMETRIX' and 'AI' integrated into the design. Below the logo, a text block states: 'Biblioshiny 5.0 now includes Biblio AI – a powerful AI assistant for your science mapping analyses.' A horizontal line separates this from a paragraph of text: 'biblioshiny and bibliometrix are open-source and freely available for use, distributed under the MIT license. When they are used in a publication, we ask that authors to cite the following reference: Aria, M., & Cuccurullo, C. (2017). **bibliometrix: An R-tool for comprehensive science mapping analysis.** *Journal of Informetrics* , 11(4), 959-975. Failure to properly cite the software is considered a violation of the license.'

# Import the data

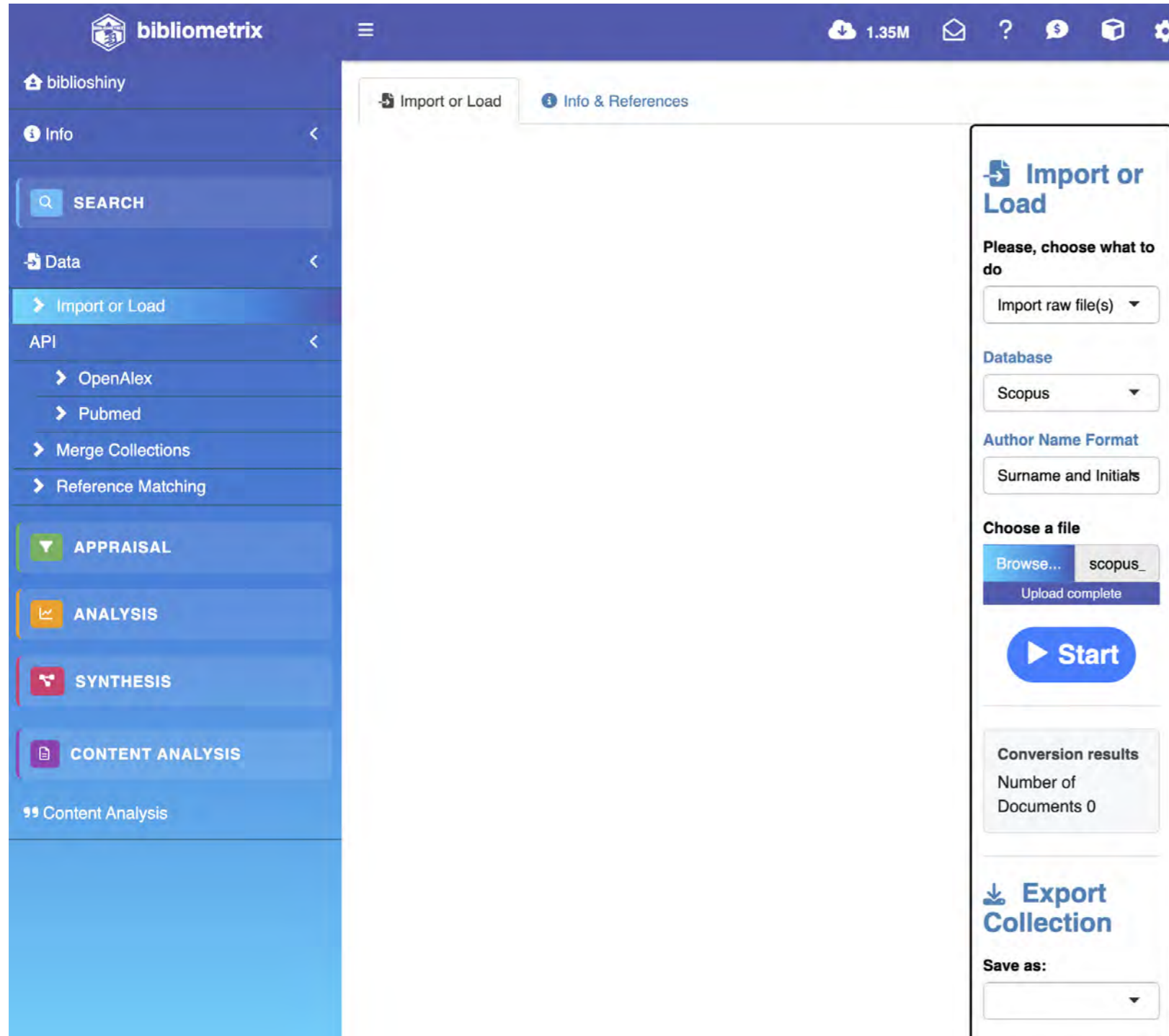


The screenshot shows the bibliometrix web application interface. On the left is a dark blue sidebar with navigation options: 'biblioshiny', 'Info', 'SEARCH', 'Data', 'Import or Load' (highlighted), 'API', 'OpenAlex', 'Pubmed', 'Merge Collections', 'Reference Matching', 'APPRAISAL', 'ANALYSIS', 'SYNTHESIS', 'CONTENT ANALYSIS', and 'Content Analysis'. The main content area has two tabs: 'Import or Load' (active) and 'Info &amp; References'. On the right, a white panel titled 'Import or Load' contains a dropdown menu for 'Please, choose what to do', a 'Conversion results' section showing 'Number of Documents 0', and an 'Export Collection' section with a 'Save as:' dropdown menu. The top navigation bar includes the 'bibliometrix' logo, a hamburger menu, and icons for user profile, 1.35M, help, chat, and settings. A browser address bar at the bottom left shows '127.0.0.1:4835/#shiny-tab-openalexMenu'.

# Import the data (e.g., in CSV)

- The file is imported into xlsx via the import function (if you only have one DB, you can load a single file from Load into Scopus or WoS and parse)

# Import the data (e.g., in CSV)

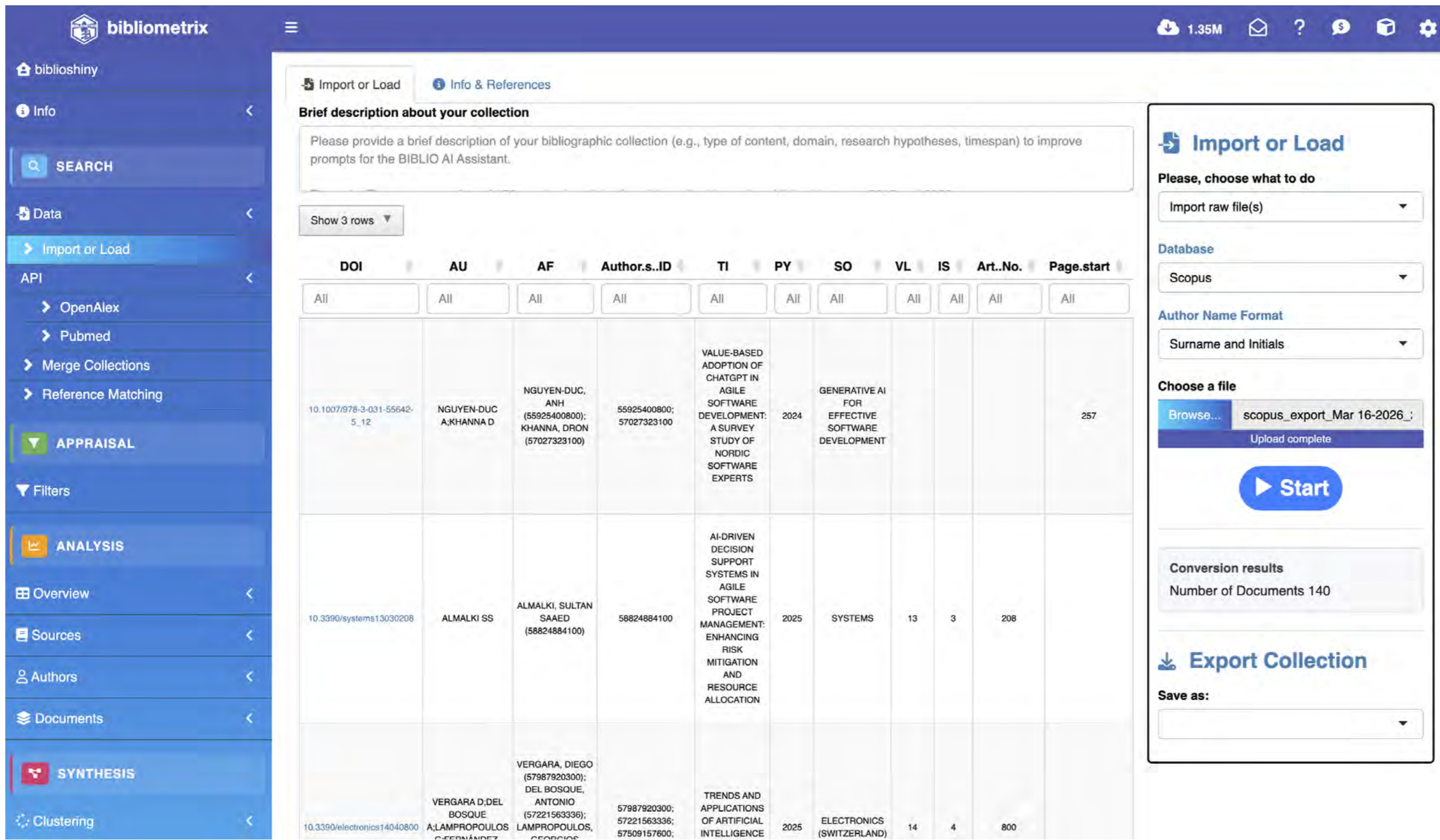


## Completeness of metadata -- 140 docs from Scopus

Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
AU	Author	5	3.57	Good
C1	Affiliation	6	4.29	Good
DI	DOI	11	7.86	Good
DE	Keywords	20	14.29	Acceptable
ID	Keywords Plus	28	20.00	Acceptable
RP	Corresponding Author	49	35.00	Poor
CR	Cited References	140	100.00	Completely missing
WC	Science Categories	140	100.00	Completely missing

[Advice](#)
[Report](#)
[Save](#)
[Close](#)

# Import the data (e.g., in CSV)



**Import or Load**

Please, choose what to do: Import raw file(s)

Database: Scopus

Author Name Format: Surname and Initials

Choose a file: Browse... scopus\_export\_Mar 16-2026\_ ; Upload complete

**Start**

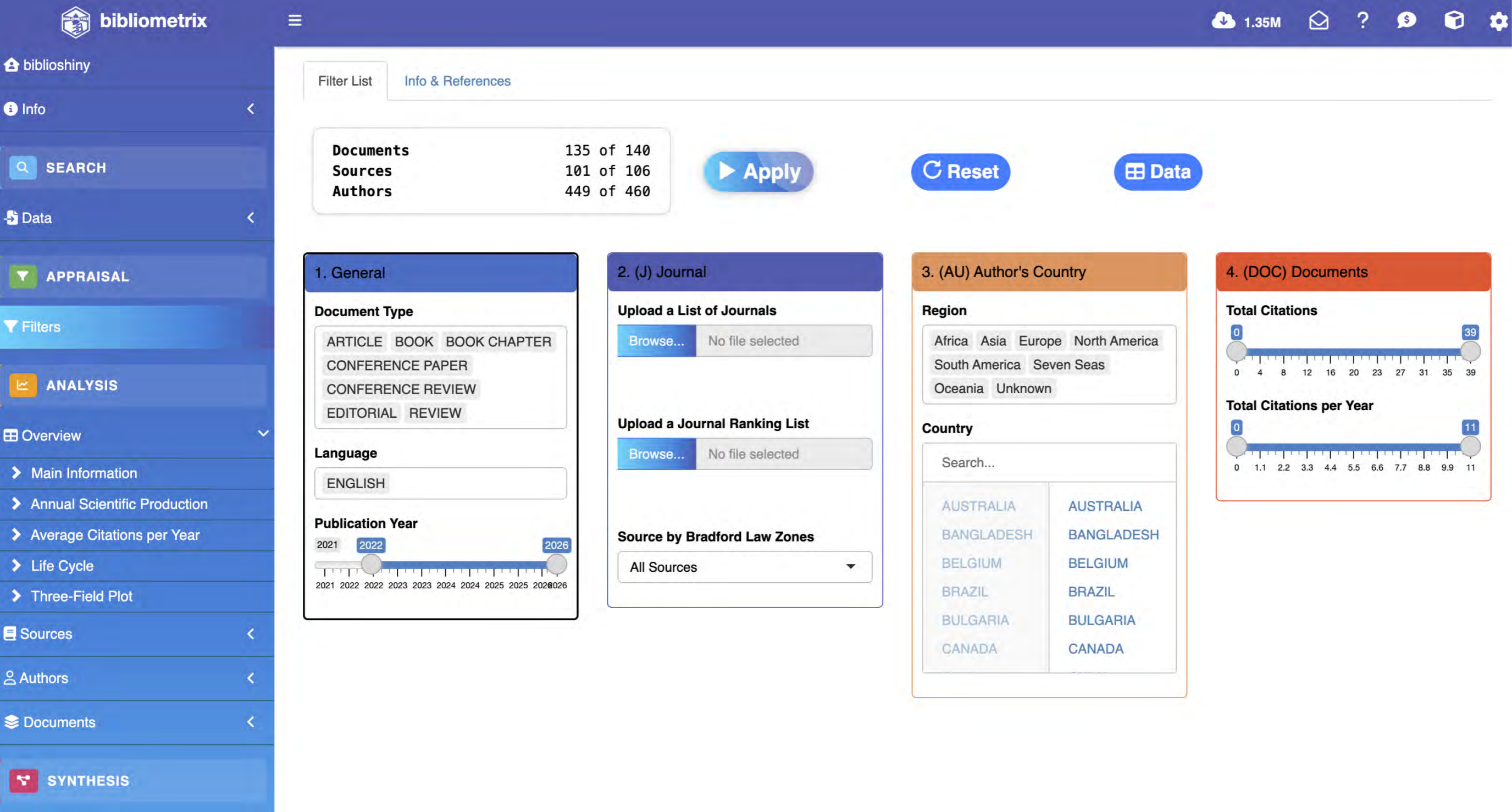
Conversion results: Number of Documents 140

**Export Collection**

Save as:

DOI	AU	AF	Author.s..ID	TI	PY	SO	VL	IS	Art..No.	Page.start
10.1007/978-3-031-55642-5_12	NGUYEN-DUC A;KHANNA D	NGUYEN-DUC, ANH (55925400800); KHANNA, DRON (57027323100)	55925400800; 57027323100	VALUE-BASED ADOPTION OF CHATGPT IN AGILE SOFTWARE DEVELOPMENT: A SURVEY STUDY OF NORDIC SOFTWARE EXPERTS	2024	GENERATIVE AI FOR EFFECTIVE SOFTWARE DEVELOPMENT				257
10.3390/systems13030208	ALMALKI SS	ALMALKI, SULTAN SAAED (58824884100)	58824884100	AI-DRIVEN DECISION SUPPORT SYSTEMS IN AGILE SOFTWARE PROJECT MANAGEMENT: ENHANCING RISK MITIGATION AND RESOURCE ALLOCATION	2025	SYSTEMS	13	3	208	
10.3390/electronics14040800	VERGARA D,DEL BOSQUE A;LAMPROPOULOS	VERGARA, DIEGO (57987920300); DEL BOSQUE, ANTONIO (57221563336); LAMPROPOULOS, GEORGIOS	57987920300; 57221563336; 57509157600;	TRENDS AND APPLICATIONS OF ARTIFICIAL INTELLIGENCE	2025	ELECTRONICS (SWITZERLAND)	14	4	800	

# Filters can be applied



The screenshot shows the bibliometrix interface with a sidebar on the left and a main content area. The sidebar includes sections for 'APPRAISAL', 'Filters', 'ANALYSIS', and 'SYNTHESIS'. The main content area displays a 'Filter List' with 'Info & References' selected. Summary statistics show 135 of 140 Documents, 101 of 106 Sources, and 449 of 460 Authors. Below this are four filter panels:

- 1. General:** Document Type (ARTICLE, BOOK, BOOK CHAPTER, CONFERENCE PAPER, CONFERENCE REVIEW, EDITORIAL, REVIEW), Language (ENGLISH), and Publication Year (2021-2026).
- 2. (J) Journal:** Upload a List of Journals and Upload a Journal Ranking List (both with 'Browse...' buttons and 'No file selected' status), and Source by Bradford Law Zones (All Sources).
- 3. (AU) Author's Country:** Region (Africa, Asia, Europe, North America, South America, Seven Seas, Oceania, Unknown) and Country (AUSTRALIA, BANGLADESH, BELGIUM, BRAZIL, BULGARIA, CANADA).
- 4. (DOC) Documents:** Total Citations (0-39) and Total Citations per Year (0-11).

Buttons for 'Apply', 'Reset', and 'Data' are visible above the filter panels.

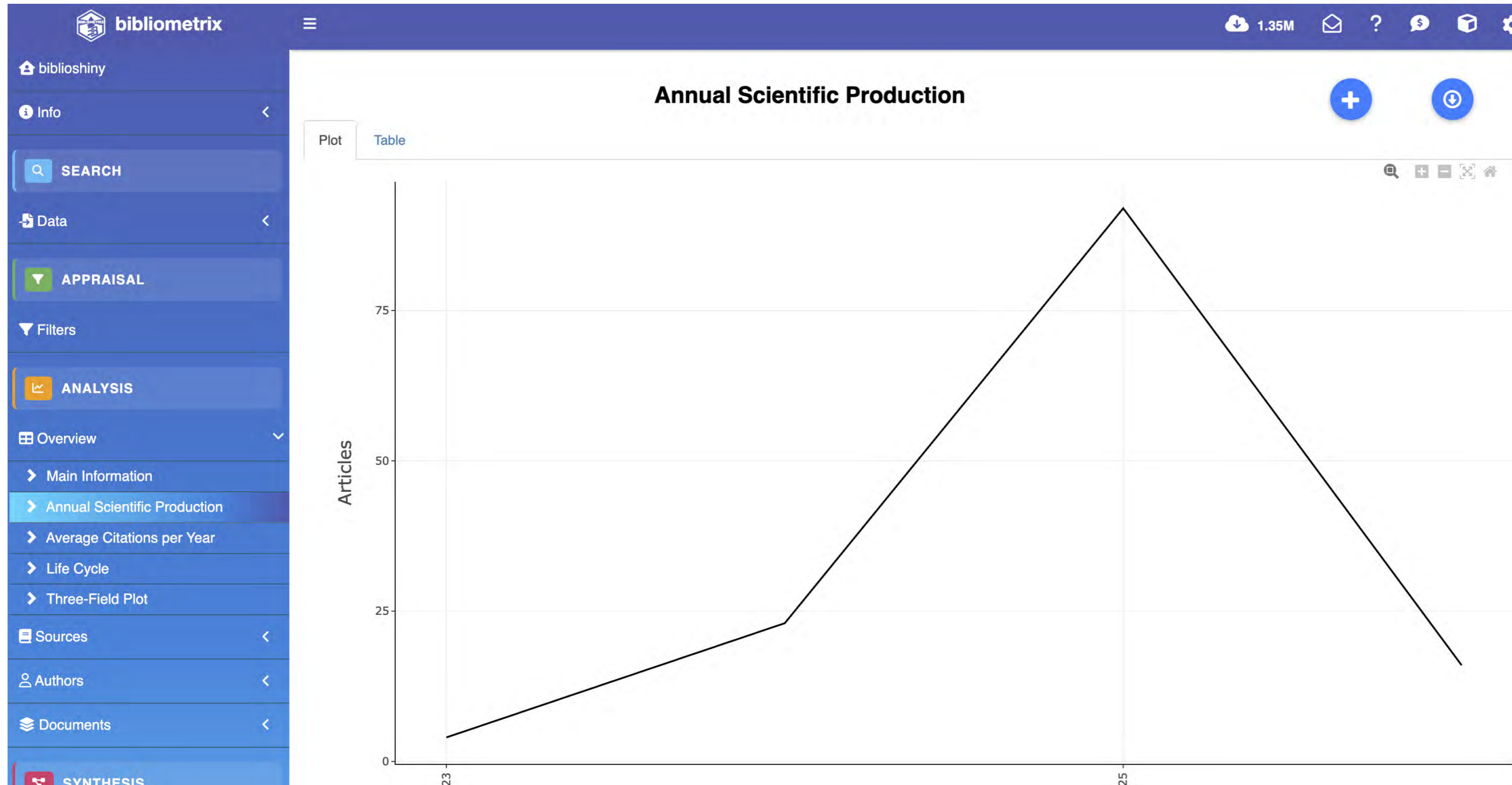
# Analysing



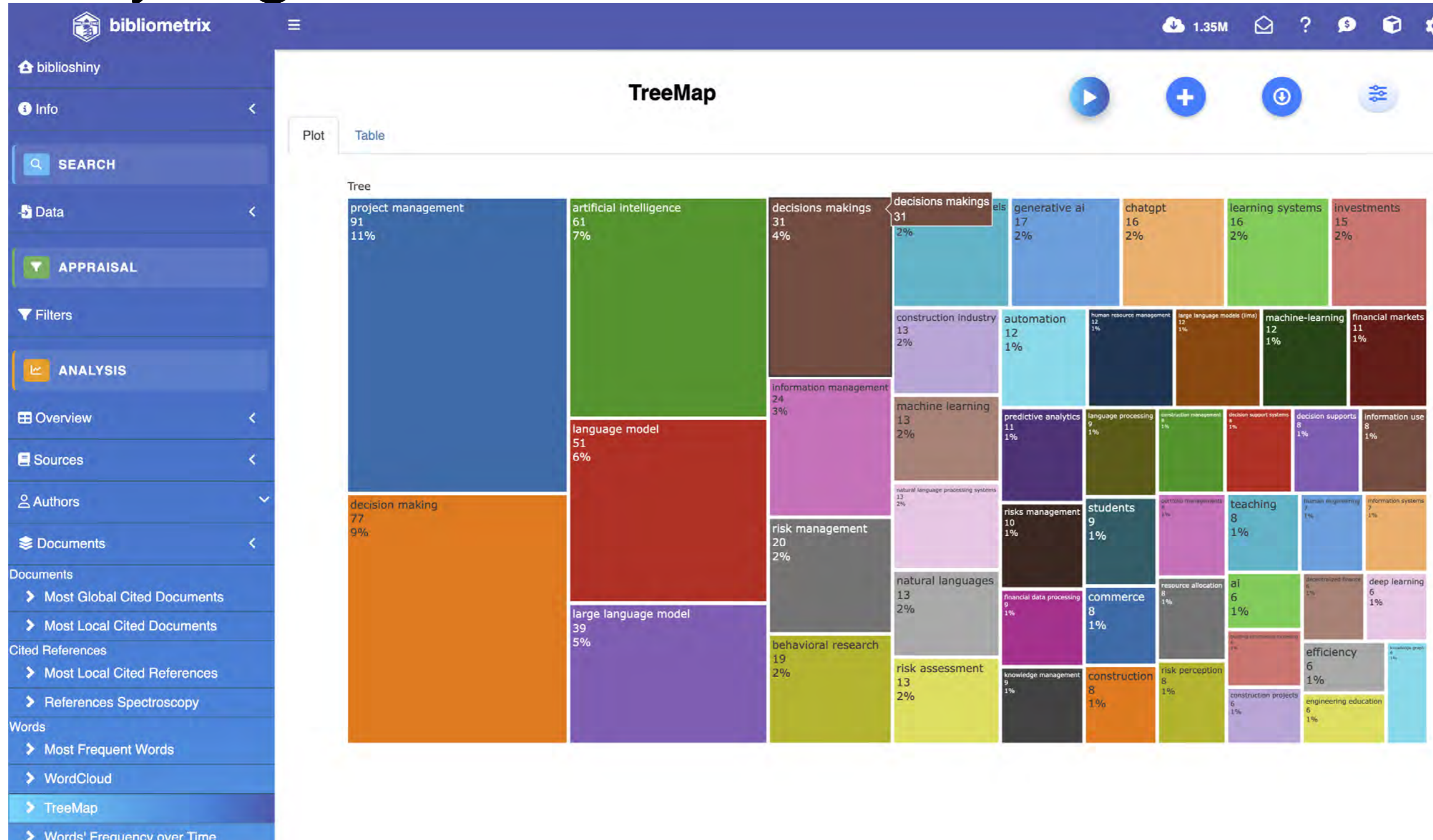
The screenshot displays the 'Main Information' dashboard of the bibliometrix software. The interface includes a top navigation bar with the 'bibliometrix' logo and a user profile 'biblioshiny'. A left sidebar contains navigation options: 'Info', 'SEARCH', 'Data', 'APPRAISAL', 'Filters', 'ANALYSIS', and 'Overview'. The 'Main Information' section is currently active, showing a grid of 12 key metrics. At the top of this section, there are tabs for 'Plot', 'Table', 'Biblio AI', and 'Info & References'. A '+ ' button is located in the top right corner of the main content area.

Metric	Value
Timespan	2023:2026
Sources	101
Documents	135
Annual Growth Rate	58.74 %
Authors	449
Authors of single-authored docs	16
International Co-Authorship	22.22 %
Co-Authors per Doc	3.44
Author's Keywords (DE)	435
References	0
Document Average Age	1.11
Average citations per doc	3.096

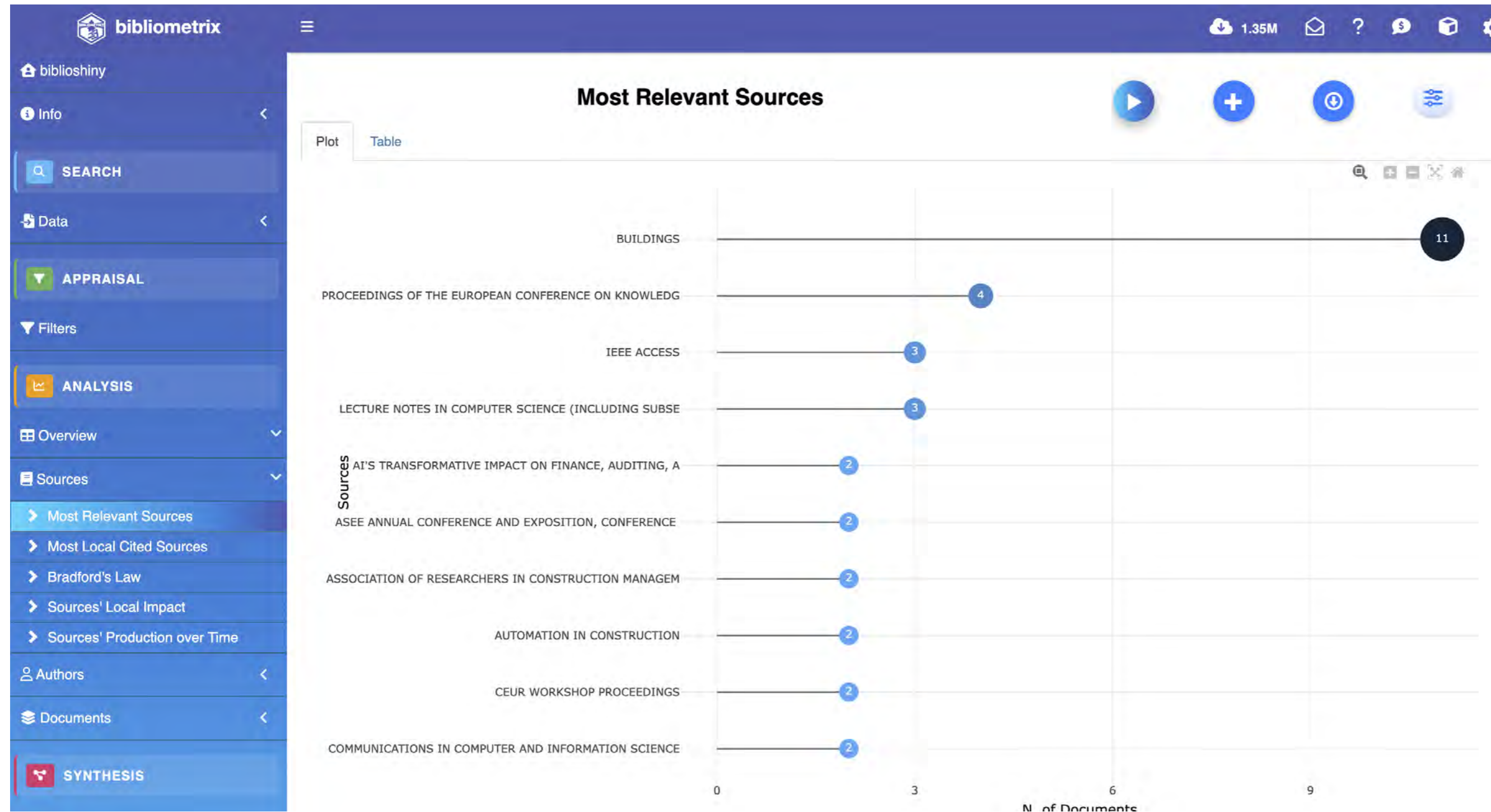
# Analysing



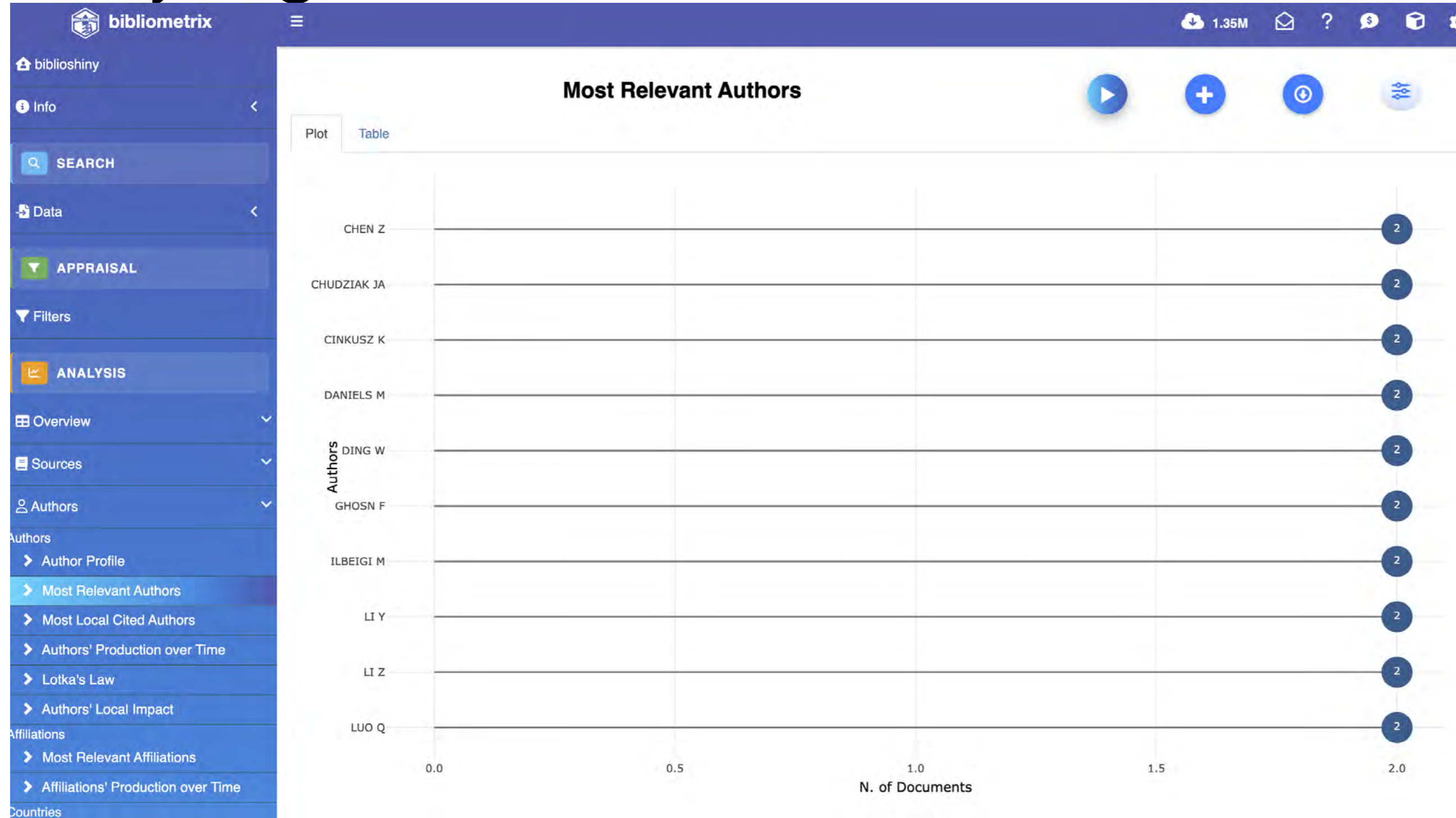
# Analysing



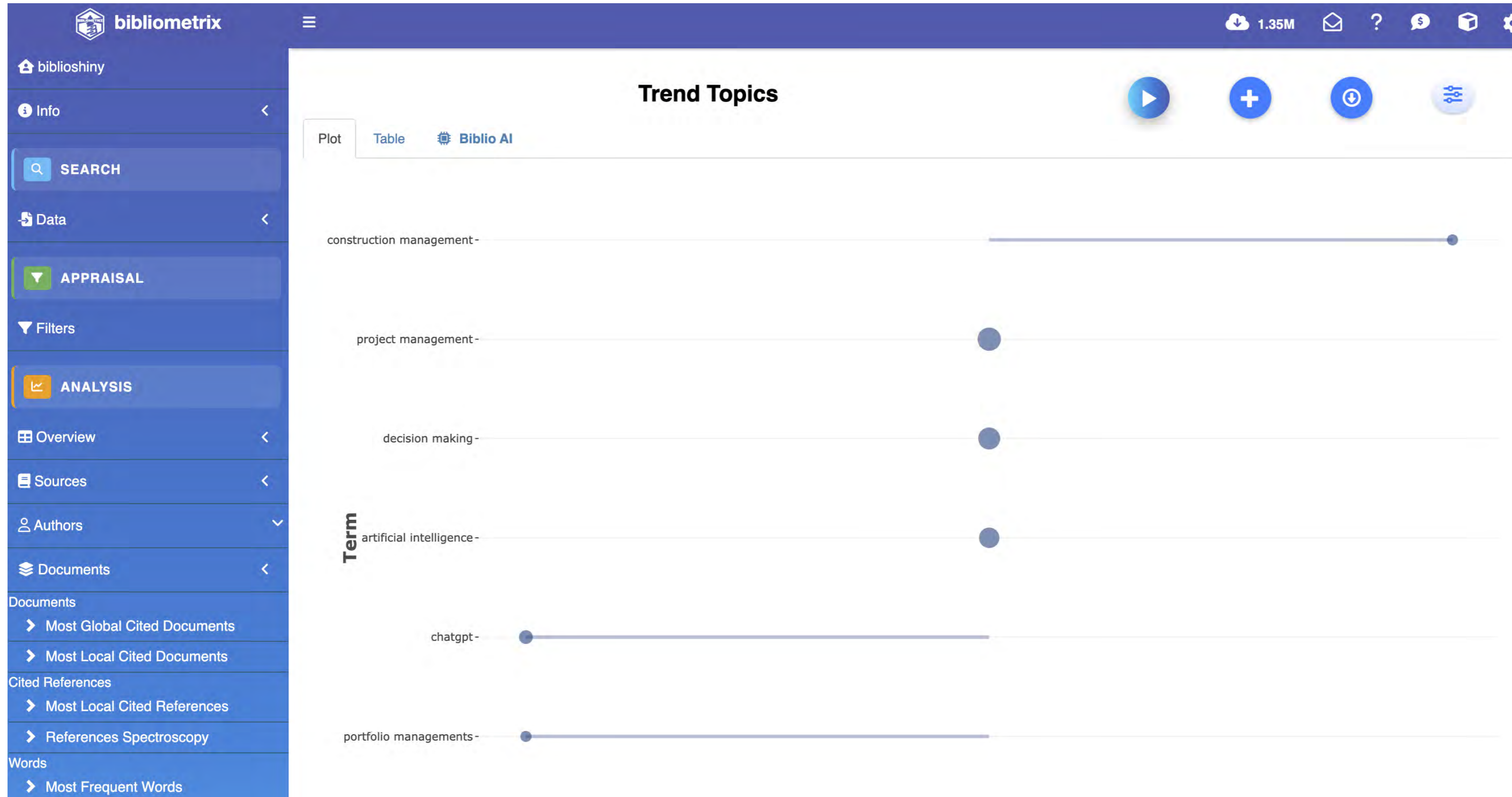
# Analysing



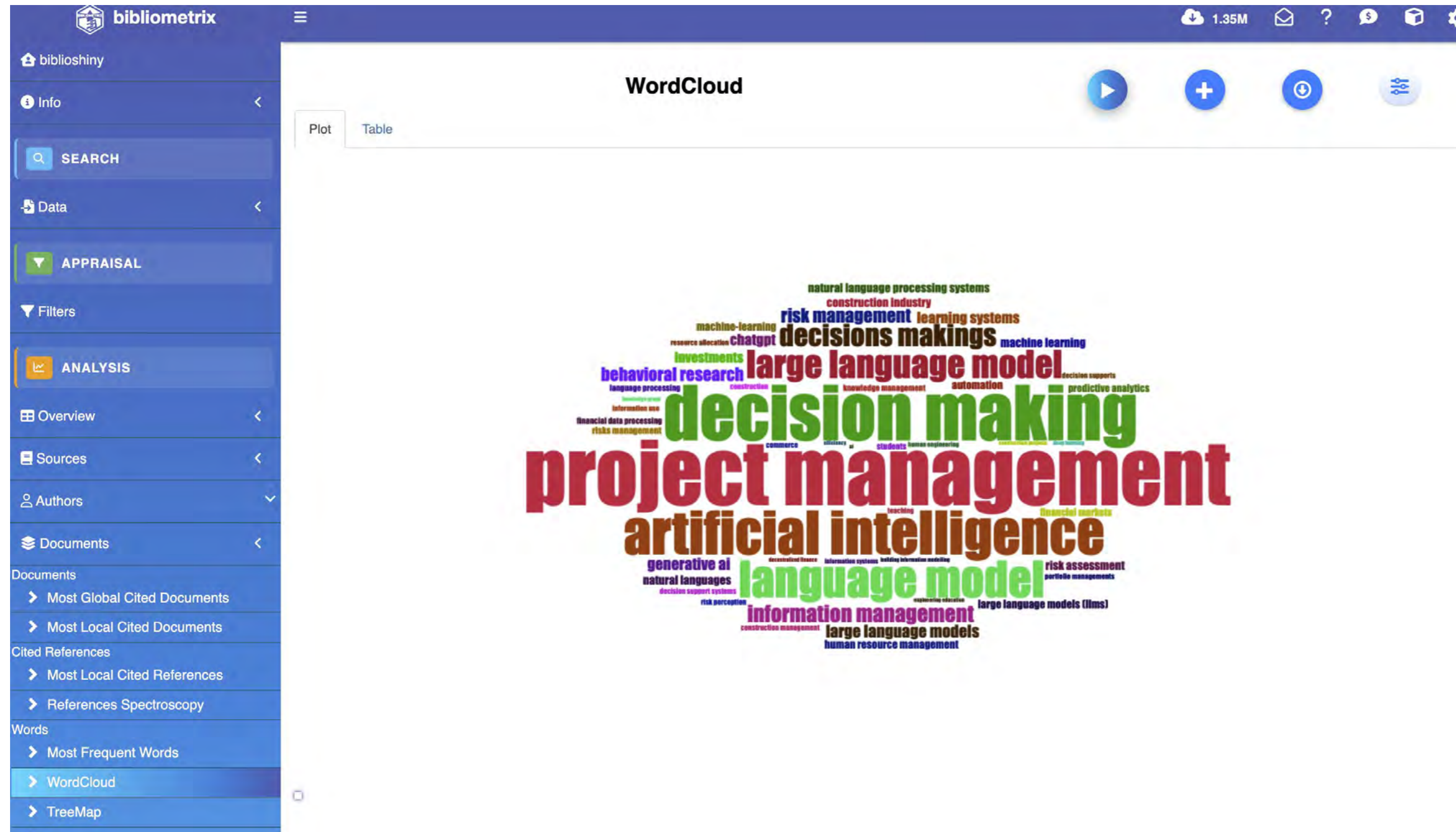
# Analysing



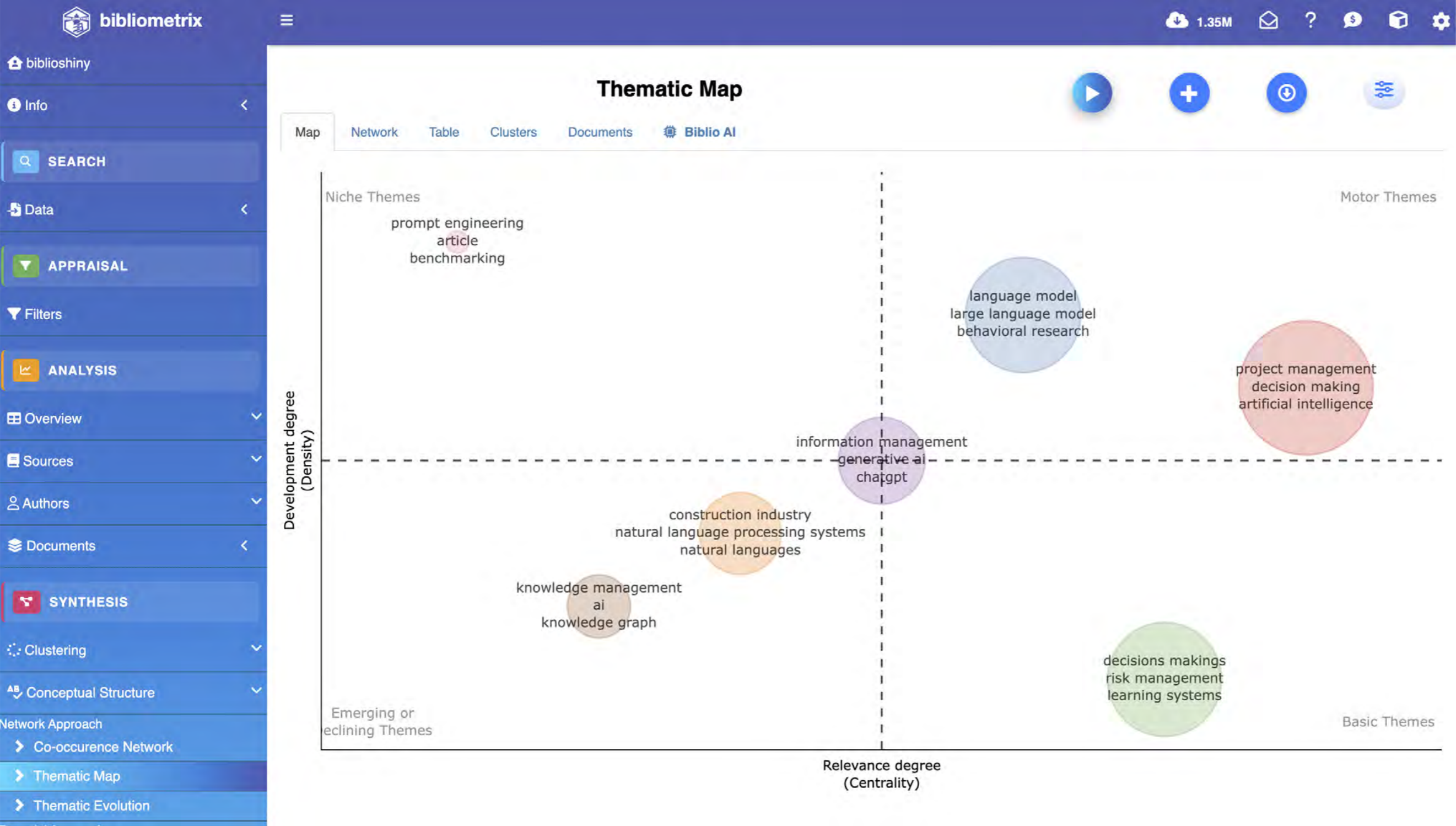
# Analysing



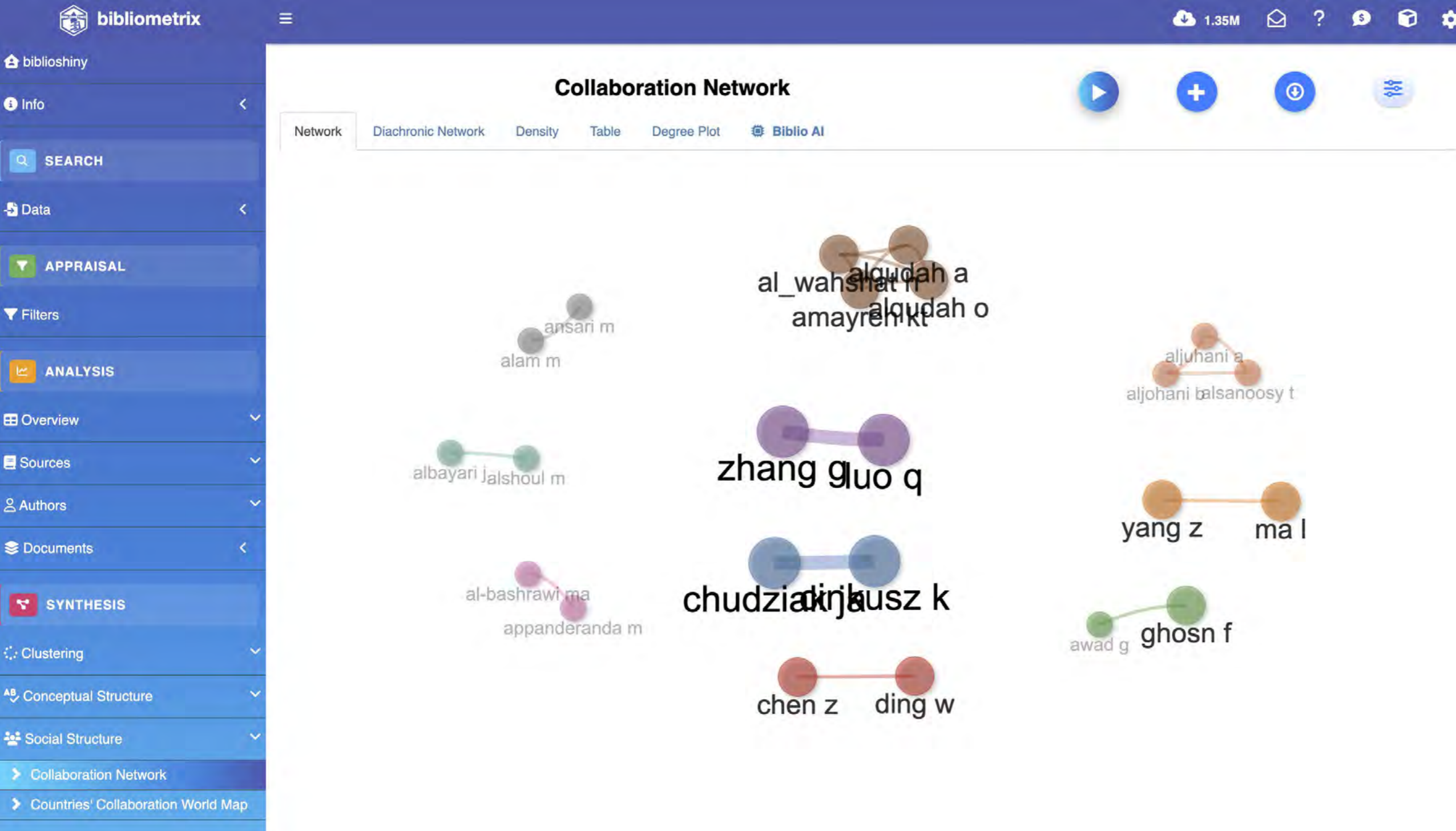
# Analysing



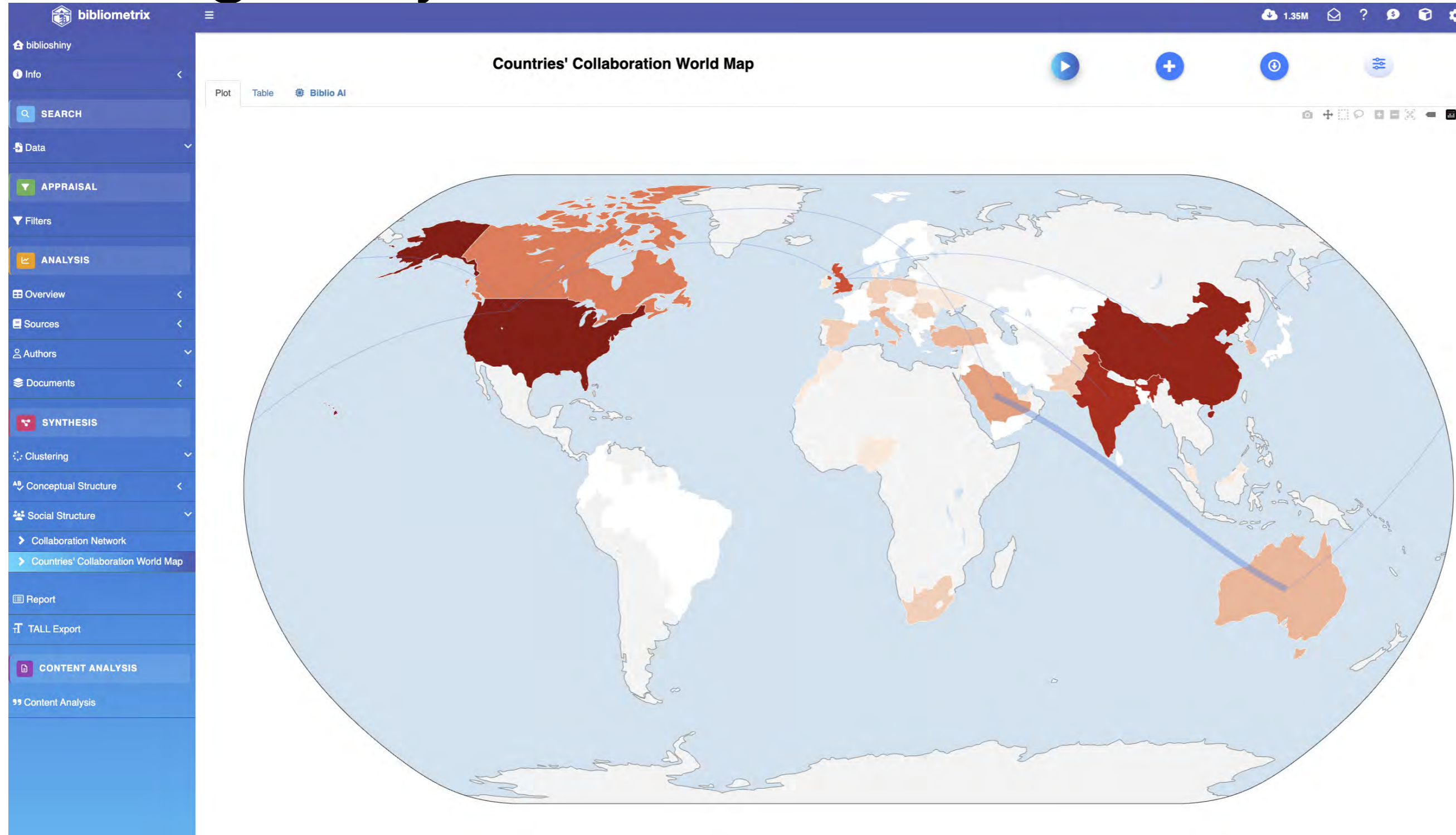
# Making the synthesis



# Making the synthesis



# Making the synthesis



# Content analysis can be done



# Content analysis can be done



**bibliometrix** | 1.35M | ? | ? | ? | ?

Import and Analyze PDF File | Info & References

## Scientific Article Content Analysis

Upload a PDF file and analyze citation patterns, context, and co-occurrence networks.

View Original Text | DOI: Not available | Export All Results

Choose Import Method

- Import PDF File
- Load Saved Text File

1. Import PDF File

2. Analysis Parameters

Context Window Size (words): 20

Max Distance for Network (chars): 800

Advanced Options

- Parse complex multiple citations
- Remove stopwords from analysis

Custom stopwords (comma-separated):

3. Run Analysis

Start | Reset

---

**Descriptive Statistics** | Word Trends | In-Context Citations | Network Analysis | References | BiblioAI Summary

- TOTAL WORDS: 6,665
- CITATIONS FOUND: 48
- NARRATIVE CITATIONS: 0
- CITATION DENSITY: 5 /1000 words
- FLESCH-KINCAID GRADE: 14.4
- READING EASE: 14.4
- ARI INDEX: 14.5
- GUNNING FOG INDEX: 17.1

**Readability Indices**

READABILITY INDICES

- Flesch-Kincaid: 14.4 • Grade 14
- Reading Ease: 14.4 • Difficult
- ARI Index: 14.5 • Grade 15
- Gunning Fog: 17.1 • Very difficult

Sentences: 853 • Words: 10,997  
Syllables: 23,311 • Complex: 3,277 (29.8%)  
Avg sentence length: 12.9 words

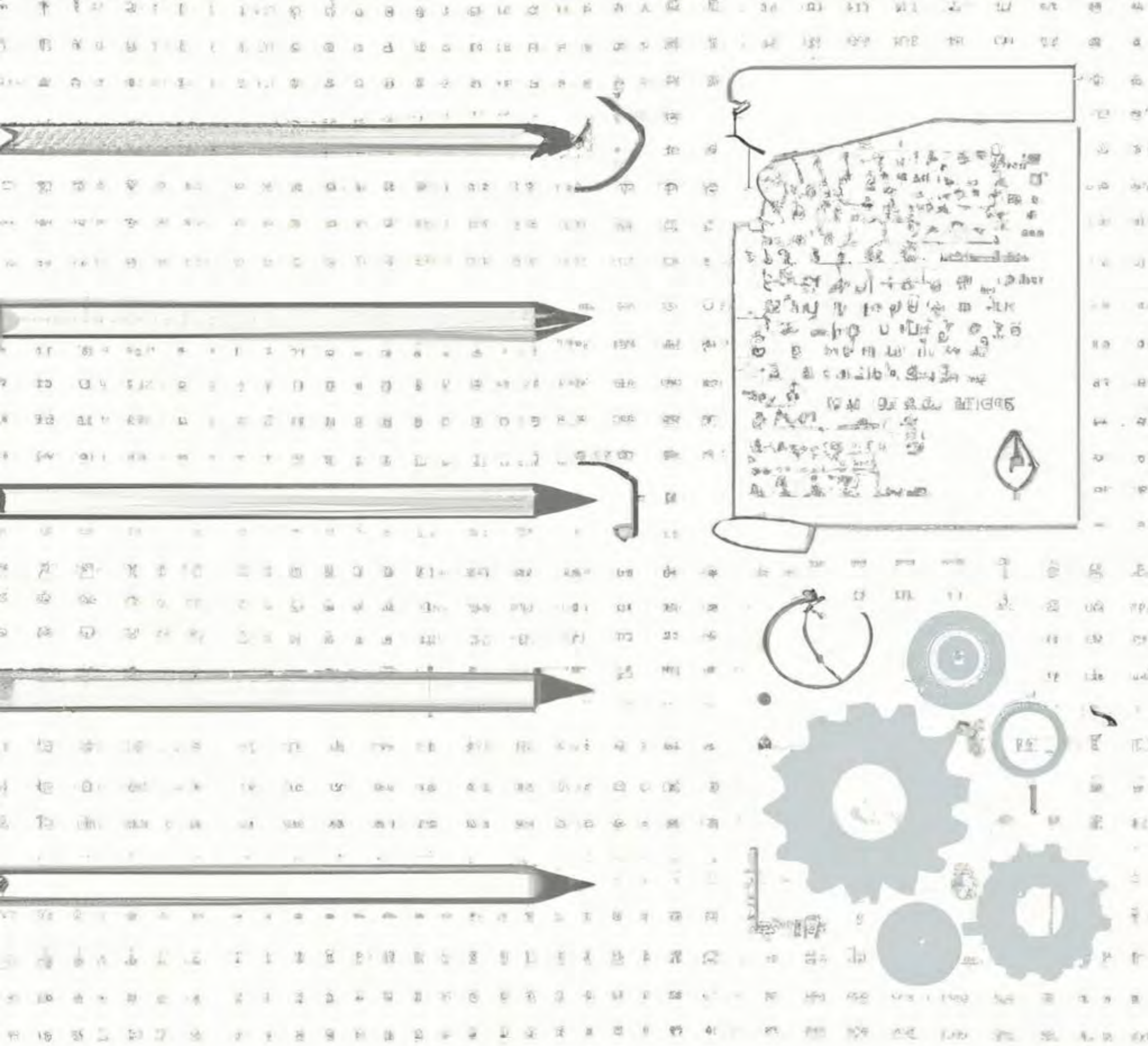
**Text Statistics**

TEXT STATISTICS

- Characters: 75,810
- Words: 10,224
- Sentences: 686
- Syllables: 23,311
- Complex words: 3,277 (29.8%)
- Avg words/sentence: 14.9
- Lexical diversity: 0.224

**N-grams Analysis**

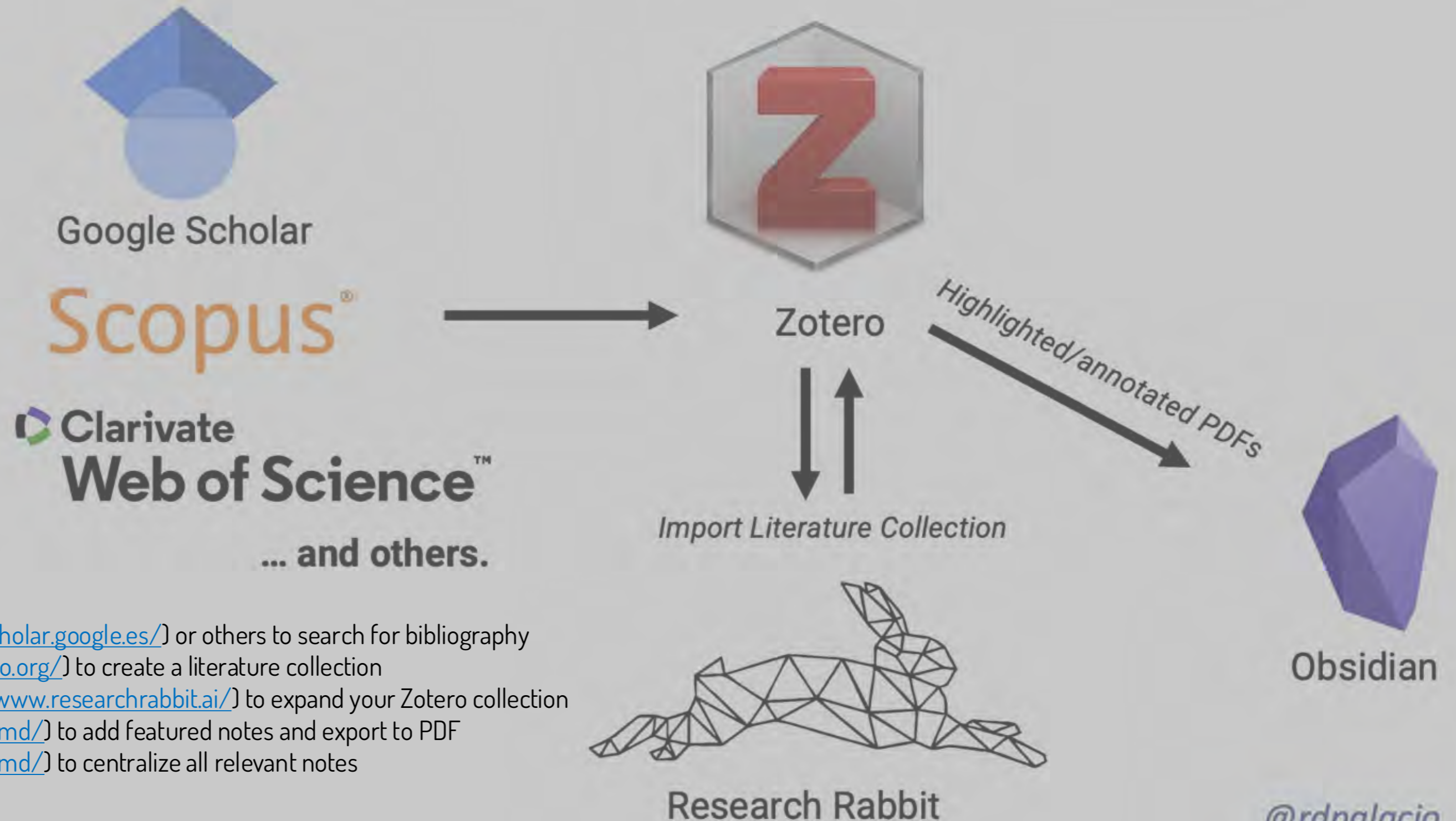
Top Unigrams		Top Bigrams		Top Trigrams	
rank	word	rank	ngram	rank	ngram
1	framework	1	proposed framework	1	agile project management
2	resource	2	project management	2	ai driven decision
3	agile	3	real time	3	driven decision support
4	project	4	agile project	4	proposed framework framework
5	risk	5	resource allocation	5	software project management
6	time	6	figure figure	6	systems systems peer
7	management	7	framework framework	7	metric proposed framework
8	data	8	risk mitigation	8	proposed proposed framework
9	tools	9	resource distribution	9	resource idle time
10	proposed	10	decision support	10	agile software project
11	team	11	resource optimization	11	existing existing tools
12	teams	12	resource management	12	existing tools tools



# 9. Collection of workflows and tools for conducting literature reviews

# The Literature Review Workflow

Ruben Dario Palacio, PhD



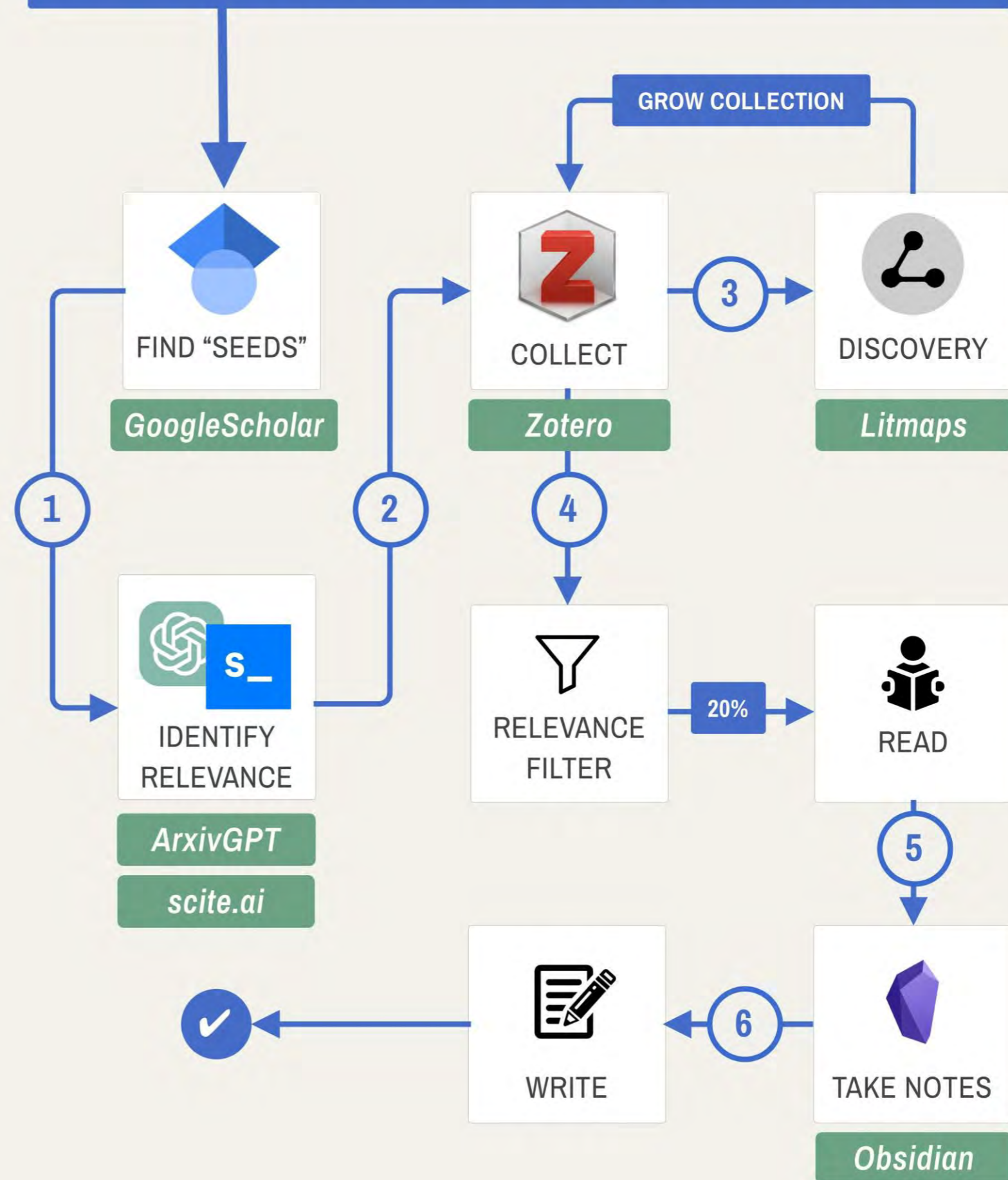
1. **Google Scholar** (<https://scholar.google.es/>) or others to search for bibliography
2. **Zotero** (<https://www.zotero.org/>) to create a literature collection
3. **Research Rabbit** (<https://www.researchrabbit.ai/>) to expand your Zotero collection
4. **Obsidian** (<https://obsidian.md/>) to add featured notes and export to PDF
5. **Obsidian** (<https://obsidian.md/>) to centralize all relevant notes

# ∞ The Effortless Literature Review



<https://twitter.com/Artifexx/status/1632277025472888833?s=20>

1. **Google Scholar** (<https://scholar.google.es/>) for searching for Bibliography Seeds
2. **Scite\_** (<https://scite.a>) to filter and add to **Zotero** (<https://www.zotero.org/>)
3. **Litmaps** to manage the collection (<https://www.litmaps.com/>)
4. **Prioritize collection**
5. **Obsidian** (<https://obsidian.md/>) to take notes
6. **Write Report**



# Automate the Literature Discovery Process



1. **Google Scholar Alerts** (<https://scholar.google.es/>)
2. **Litmaps** to manage the collection (<https://www.litmaps.com/>)
3. **Visualping** (<https://visualping.io>)



<https://twitter.com/Artifexx/status/1633748341946458112?s=20>

# The Literature Review Browser Setup



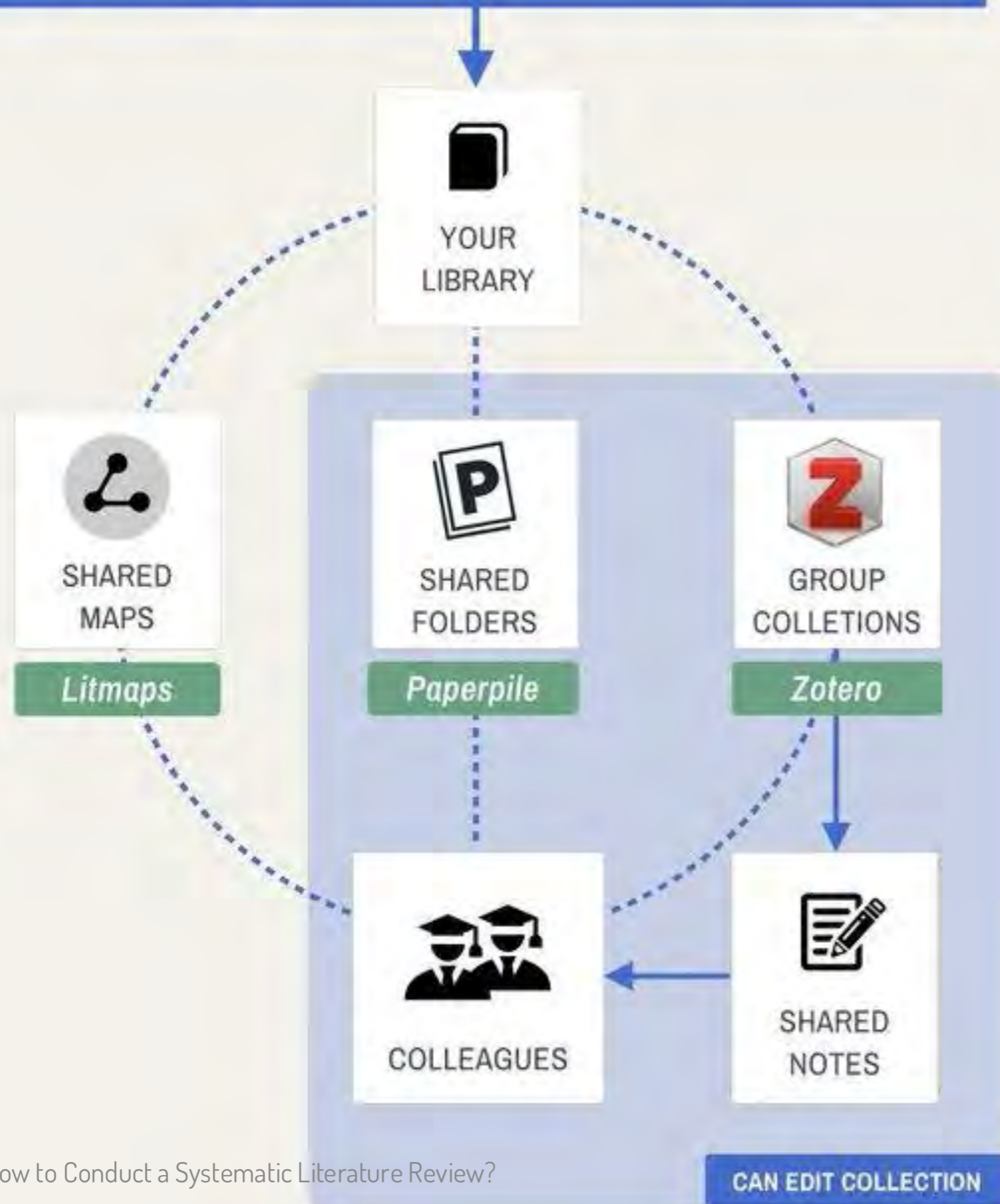
<https://twitter.com/Artifexx/status/1633330298569072647?s=20>



How to Conduct a Systematic Literature Review?

1. **Scholarcy** (<https://www.scholarcy.com/>) to summarize articles automatically
2. **Scite\_** (<https://scite.a>) to analyze the reliability of an article based on its citations, mentions, and contrasts
3. **arXivGPT** (<http://bit.ly/3L9mUTX>) automatically resume arXiv articles
4. **Zotero** (<https://www.zotero.org/>), **Paperpile** (<https://paperpile.com/>), **CiteDrive** (<https://www.citedrive.com/>) as bibliography managers
5. **Scholar H-Index Calculator for Google Chrome** (<http://bit.ly/3F9sJNe>) for calculating metrics on **Google Scholar** (<https://scholar.google.es/>)
6. **Readwise** (<https://readwise.io/read>) to save documents from the web and import them into **Obsidian** (<https://obsidian.md/>) to add notes
7. **Unpaywall** (<https://unpaywall.org/>) to access to full-text articles when an open version is available

## Sharing your Literature Review with Colleagues



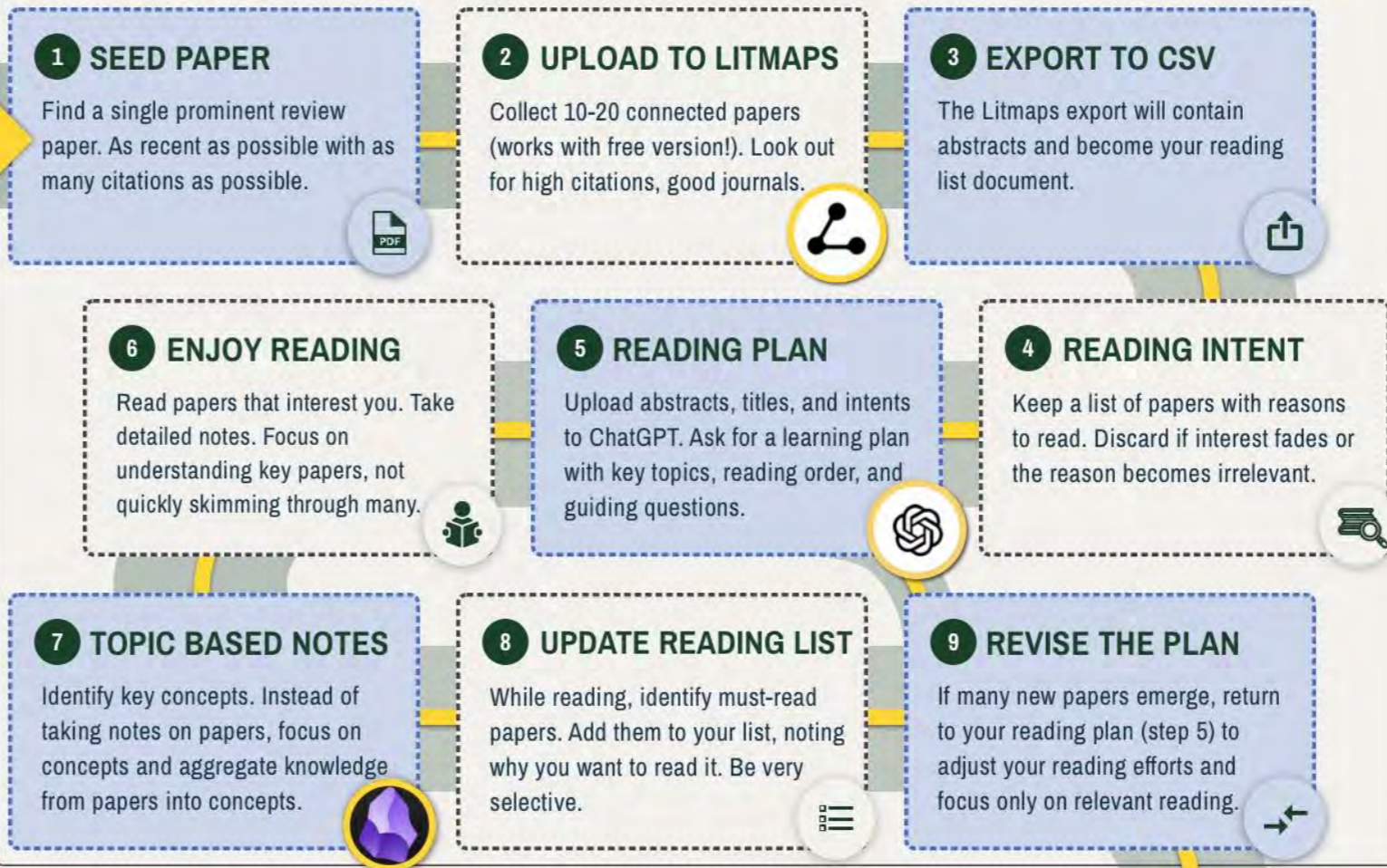
1. **Zotero** (<https://www.zotero.org/>), **Paperpile** (<https://paperpile.com/>), or **Litmaps** (<https://www.litmaps.com/>) have options to share collections with other researchers
2. **Obsidian** (<https://obsidian.md/>) to add notes and share them

# AI Literature Review - In 2025



<https://x.com/Artifexx/status/1925480240580829587>

## READING & NOTES



## IDEAS & WRITING



- Litmaps
- ChatGPT
- NotebookLM
- Draw.io
- Obsidian

# Automatic Summaries

- There are tools that automatically summarize or answer questions about the content of an article
  - **alphaXiv** (<https://www.alphaxiv.org/>)
  - **arXivGPT** (<https://arxivgpt.net/>)
  - **ChatGPT** (<https://chatgpt.com/>)
  - **ChatPDF** (<https://www.chatpdf.com>)
  - **Humanata** (<https://www.humata.ai>)
  - **Klavier** (<https://klavier.ai>)
  - **Scholarcy** (<https://www.scholarcy.com/>)
  - **SciSpace Copilot** (<https://typeset.io>)
  - **SolarXiv** (<http://bit.ly/3L9mUTX>)

The screenshot shows the alphaXiv website interface. On the left is a navigation sidebar with options like 'Explore', 'Communities', 'My Library', 'Notifications', 'Profile', and 'Get extension'. The main content area displays a list of research papers. The top paper is 'R1-Searcher: Incentivizing the Search Capability in LLMs via Reinforcement Learning' by Huatong Song, Jinhao Jiang, Yingqian Mia, Jie Chen, Zhipeng Chen, Wayne Xin Zhao, Lei Fang, and Ji-Rong Wen. Below it are 'Vision-R1: Incentivizing Reasoning Capability in Multimodal Large Language Models' and 'Inductive Moment Matching'. Each paper entry includes a thumbnail, title, authors, and a brief description.

The screenshot shows the arXiv preprint page for the paper 'R1-Searcher: Incentivizing the Search Capability in LLMs via Reinforcement Learning'. The page includes the title, authors (Huatong Song<sup>1</sup>, Jinhao Jiang<sup>1\*</sup>, Yingqian Mia<sup>1</sup>, Jie Chen<sup>1</sup>, Zhipeng Chen<sup>1</sup>, Wayne Xin Zhao<sup>1</sup>, Lei Fang<sup>2</sup>, Ji-Rong Wen<sup>1</sup>), affiliations (Gaoqing School of Artificial Intelligence, Renmin University of China; DataCanvas Alaya NeW), and the abstract. The abstract describes the R1-Searcher framework as a novel two-stage outcome-based RL approach designed to enhance the search capabilities of LLMs by autonomously invoking external search systems. The introduction section discusses the challenges of Large Reasoning Models (LRMs) and the need for external information during the reasoning process.

arXiv:2503.05592v1 [cs.AI] 7 Mar 2025

## R1-Searcher: Incentivizing the Search Capability in LLMs via Reinforcement Learning

### Table of Contents

- [Introduction](#)
- [Research Context](#)
- [The R1-Searcher Framework](#)
- [Two-Stage Reinforcement Learning Approach](#)
- [Training Process and Implementation](#)
- [Experimental Results](#)
- [Real-World Applications](#)
- [Limitations and Future Work](#)
- [Conclusion](#)

### Introduction

Large Language Models (LLMs) have revolutionized the field of artificial intelligence with their remarkable capabilities in understanding and generating text. However, LLMs often struggle with knowledge-intensive tasks where they need to access information beyond their internal knowledge. This limitation leads to inaccuracies and hallucinations, particularly when dealing with time-sensitive information or complex queries requiring multiple pieces of knowledge.

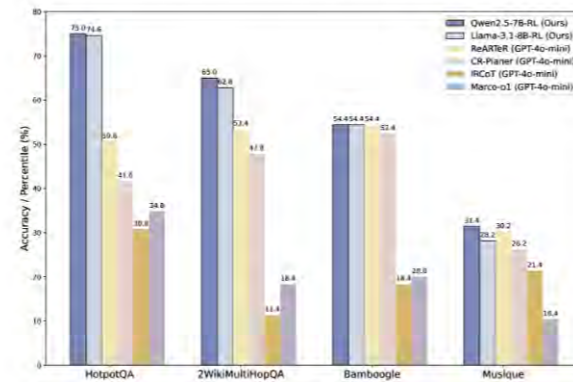


Figure 1: Performance comparison of R1-Searcher (using Qwen-2.5-7B-RL and Llama-3.1-8B-RL) against existing methods across four QA benchmarks, showing significant improvements on both in-domain (HotpotQA, 2WikiMultiHopQA) and out-of-domain (Bamboogle, Musique) datasets.

The paper "R1-Searcher: Incentivizing the Search Capability in LLMs via Reinforcement Learning" introduces a novel approach to address this challenge by enhancing the ability of LLMs to autonomously invoke and utilize external search systems during the reasoning process. Unlike existing Retrieval-Augmented Generation (RAG) methods that rely on complex prompt engineering, supervised fine-tuning, or test-time scaling techniques, R1-Searcher leverages a two-stage reinforcement learning approach to train LLMs to search for information when needed.

### Research Context

Current approaches to augment LLMs with external knowledge sources typically fall into three categories:

- Complex Prompt Engineering:** Techniques that carefully craft prompts to guide LLMs in formulating search queries and using retrieved information. These methods often struggle with generalization and require considerable manual effort.
- Supervised Fine-Tuning (SFT):** Approaches that distill knowledge from more capable LLMs to teach models when and how to search. While effective, these methods face limitations in generalization as models may memorize solution paths rather than truly learning search capabilities.
- Test-Time Scaling Methods:** Techniques like Monte Carlo Tree Search (MCTS) that explore multiple reasoning paths during inference. While powerful, these methods introduce significant inference overhead, making them impractical for real-time applications.

R1-Searcher aims to address the limitations of these approaches by providing a more effective and efficient framework for

Explain me the 3 more important contributions of this paper

The three most important contributions of the paper "R1-Searcher: Incentivizing the Search Capability in LLMs via Reinforcement Learning" are:

- R1-Searcher Framework:** The paper introduces a novel two-stage Reinforcement Learning (RL) framework to enable autonomous retrieval during the reasoning process of Large Language Models (LLMs).
- Superior Performance:** Extensive experiments demonstrate that R1-Searcher consistently and significantly outperforms existing Retrieval-Augmented Generation (RAG) methods, even surpassing a closed-source GPT-4o-mini model.
- Generalization Ability:** The approach exclusively employs RL for training, without requiring distillation or cold start, and exhibits strong generalization capabilities to out-of-domain datasets and online search scenarios. It is effective for both base and instruction-tuned models.

Summarize this paper in 100 words

R1-Searcher enhances LLMs' reasoning by incentivizing search capabilities via reinforcement learning (RL). It introduces a two-stage, outcome-based RL approach where LLMs learn to autonomously invoke external search systems for knowledge acquisition during reasoning. The framework uses a tailored reward system without needing process rewards or distillation. Experiments show R1-Searcher significantly outperforms strong RAG methods, even closed-source models, on multi-hop datasets. Key contributions include the novel RL framework and demonstrated generalization to out-of-domain and online search scenarios, improving LLMs' ability to retrieve and integrate information effectively.





# Example of a summary made with SolarXiv

arXiv > cs > arXiv:2503.09436

Computer Science > Human-Computer Interaction

[Submitted on 12 Mar 2025]

## PromptMap: An Alternative Interaction Style for AI-Based Image Generation

Krzysztof Adamkiewicz, Paweł W. Woźniak, Julia Dominiak, Andrzej Romanowski, Jakob Karolus, Stanislav Frolov

Recent technological advances popularized the use of image generation among the general public. Crafting effective prompts can, however, be difficult for novice users. To tackle this challenge, we developed PromptMap, a new interaction style for text-to-image AI that allows users to freely explore a vast collection of synthetic prompts through a map-like view with semantic zoom. PromptMap groups images visually by their semantic similarity, allowing users to discover relevant examples. We evaluated PromptMap in a between-subject online study (n = 60) and a qualitative within-subject study (n = 12). We found that PromptMap supported users in crafting prompts by providing them with examples. We also demonstrated the feasibility of using LLMs to create vast example collections. Our work contributes a new interaction style that supports users unfamiliar with prompting in achieving a satisfactory image output.

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**Summary:**

The paper titled "PromptMap: An Alternative Interaction Style for AI-Based Image Generation" presents an innovative approach to improve the text-to-image AI interaction style, specifically for novice users who struggle with crafting effective prompts. The authors propose PromptMap, a new interaction style that allows users to freely explore a collection of synthetic prompts through a map-like view with semantic zoom. The images are grouped visually based on their semantic similarity, enabling users to discover relevant examples. This method is evaluated using a between-subject online study (n=60) and a qualitative within-subject study (n=12), finding that PromptMap effectively supports users in crafting prompts by providing examples.

**Key Contributions & Significance:**

- New interaction style:** The major contribution of this work is the development of PromptMap, a new interaction style that supports users in creating effective prompts for text-to-image AI.
- Semantic zoom and visual grouping:** The use of semantic zoom and visual grouping based on semantic similarity allows users to discover relevant examples and efficiently craft prompts.
- Evaluation of PromptMap:** The work demonstrates the feasibility and effectiveness of PromptMap using both between-subject online and qualitative within-subject studies.

**Insightful Questions:**

- How does PromptMap compare to existing text-to-image AI interaction styles in terms of user satisfaction and image output quality?
- What is the scalability of PromptMap in handling larger collections of synthetic prompts, and what potential performance issues might arise?
- How can PromptMap be further optimized to better support users with different levels of expertise in crafting prompts?
- What is the impact of using different LLMs to create the vast example collections, and how does this affect the prompt recommendation quality of PromptMap?
- How can PromptMap adapt to different types of AI-based image generation models, and what are the potential challenges in this process?

**Potential Applications & Implications:**

- Improved accessibility:** PromptMap can make AI-based image generation more accessible to novice users by providing a more intuitive interaction style.
- Efficient prompt crafting:** By allowing users to discover relevant examples and efficiently craft prompts, PromptMap can save time and improve the overall user experience.
- Better image output quality:** With PromptMap, users may be able to achieve higher-quality image outputs by leveraging the suggested examples.
- AI-generated content creation:** PromptMap can be applied to other AI-based content creation tasks, such as text-to-video or text-to-3D modeling, to improve user interaction styles.

**Related Topics & Future Research Directions:**

- Prompt engineering for AI-based content creation:** Further research can be focused on optimizing prompt engineering techniques for various types of AI-based content creation tasks.
- Transfer learning for prompt recommendation:** Investigating the use of transfer learning to recommend prompts for different AI-based content generation models.
- AI-assisted prompt crafting:** Developing AI agents that can assist users in crafting prompts based on their specific needs and preferences.
- Evaluation of user satisfaction:** Conducting more extensive user studies to evaluate user satisfaction with PromptMap and its impact on image output quality.
- Integration with existing AI-based image generation tools:** Exploring the integration of PromptMap with popular AI-based image generation tools, such as DALL-E, Stable Diffusion, or Midjourney.

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Comments: To be published in the proceedings of 30th International Conference on Intelligent User Interfaces (IUI '25), March 24-27, 2025, Cagliari, Italy

Subjects: **Human-Computer Interaction (cs.HC)**; Artificial Intelligence (cs.AI)

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From: Krzysztof Adamkiewicz [view email]  
[v1] Wed, 12 Mar 2025 14:31:50 UTC (7,663 KB)

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### Moodle: A Framework to Integrate m-Learning Applications with the LMS

This paper proposes a way to integrate **mobile devices** and educational applications with the **Management Systems**

[https://en.wikipedia.org/wiki/Learning\\_Management\\_Systems](https://en.wikipedia.org/wiki/Learning_Management_Systems) → **Learning Management Systems** through webservice; introducing the Moodle project that provides an extension of Moodle 2.0 webservice for mobile integration and two mobile clients ready to use on real courses

### Summary Flashcard

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All sections Key concepts Abstract Synopsis Scholarcy highlights

Scholarcy summary Comparative analysis

## Moodle: A Framework to Integrate m-Learning Applications with the LMS

María José Casany; Marc Alier; Enric Mayol et al.

2012

*This paper proposes a way to integrate mobile devices and educational applications with the Learning Management Systems through webservice; introducing the Moodle project that provides an extension of Moodle 2.0 webservice for mobile integration and two mobile clients ready to use on real courses*

### Abstract

Learning Management Systems (LMS) have become widespread among most centres for education and training. Being a mature technology, LMS have left the vanguard of innovation. Educational usage based Learning and particularly mobile devices and education introducing the Moodle project for mobile integration and two mobile clients (computers in education)

### Scholarcy Synopsis

*In this paper, the and educational a two mobile client*

M-learning enhances collaboration to be more personalized and The Moodle project aims to applications with the LMS, at These activities are intended MS. Moodle aims to propose an external applications with th

They take and organize learning content in a standard way, usually as a course divided into modules and lessons, supported with quizzes, tests, forums and discussions (Downes, 2006).

LMS have reached the goal of mimicking the structure and ways of schools, universities and other educational institutions.

The key points of the LMS success have been: 1) LMS copy the structure and practices of educational institutions, for example organizing contents in online courses; 2) LMS organize the processes and business rules.

### Objectives

Our goal was not to create a web-service layer to access every single Moodle activity feature, but to design an extension of the Moodle Webservices Architecture that provides access to the most suitable Moodle features for mobile applications.

### Findings

The success of LMS is so great that over 90% of Spanish universities and colleges use a LMS (Prendes, 2009), 95% of the learning institutions in the US use an LMS (Lonn and Teasley, 2009), and 79.5% of large companies use these systems during their training program (Wexler, Grey, Miller, Nguyen and Barnevelde, 2008).

### Discussion

The Moodle project aims to propose an interoperability solution to integrate m-learning applications with the LMS, starting with Moodle.

The Moodle connector is an extension of the Moodle Webservices Architecture that has the following advantages regarding other approaches: 1) it is an extensible architecture where new services may be added 2) it supports the addition of new communication protocols, and 3) it may be updated when a new Moodle version appears.

The Moodle project provides an open specification of services that could be implemented by other LMS and remains stable with indepe

### Conclusion

Conclusions and Further Work: m-learning enhances collaborative learning and increases learning flexibility by allowing it to be more p

The Moodle project aims to propose an interoperability solution to integrate m-learning applications with the LMS, incorporating m-learning into the learning process of educational institutions. This will allow m-learning applications to widen their scope instead of being isolated from the learning process.

The initial version of the specification works for Moodle, but authors are working to adapt this specification to other LMS such as Sakai and Olat, to create an LMS-independent specification.

Since this specification is open-source, it is open for developers of third-part applications to use it.

These activities are intended to be used from mobile devices, but are created inside the LMS.

### Confirmation of earlier findings

Considering these studies and our involvement in the Moodle community, we selected Moodle for the first step of our work. Moodle is a good candidate since it is the most used open source LMS, it is supported by a large international community, it has been translated to more than 75 languages and many Spanish educational institutions (our universities too) use it (Alier et al, 2010a; Aberdour, 2007).

The methodology used during this pilot experience is a quasi-experimental design (Campbell and Stanley, 1963; Campbell and Stanley, 1970). This methodology is adequate for these kinds of tests, since we have pre-established groups (class-groups) of users and it is not possible to have a complete randomized group of people (Denduluce, 1994; Nieto and Necaman, 2010).

### Contributions

Conclusions and Further Work: m-learning enhances collaborative learning and increases learning flexibility by allowing it to be more personalized and student-centred. But on the other hand, m-learning faces interoperability problems with LMS (the basic e-learning infrastructure of many educational institutions). The Moodle project aims to propose an interoperability solution to integrate m-learning applications with the LMS, incorporating m-learning applications into the learning process of educational institutions. This will allow m-learning applications to widen their scope instead of being isolated from the learning process. It also will allow LMS to be more flexible e-learning platforms. Although there are several solutions to this lack of integration problem, Moodle aims to propose an open specification of webservice to support the integration of external applications with the LMS. The initial version of the specification works for Moodle, but authors are working to adapt this specification to other LMS such as Sakai and Olat, to create an LMS-independent specification. Since this specification is open-source, it is open for developers of third-part applications to use it. Authors are also working in the design of special m-learning activities inside the LMS. These activities are intended to be used from mobile devices, but are created inside the LMS.

the main advantages of the proposed arizes conclusions and future work.

ive learning and increases learning flexibility cent-centred. On the other hand, m-learning basic e-learning infrastructure of many aims to propose an interoperability solution MS, incorporating m-learning applications itions. This will allow m-learning applications from the learning process. It will allow LMS to

be more flexible e-learning platforms.

# Rayyan

<https://www.rayyan.ai/>



The image shows a screenshot of the Rayyan website. The top navigation bar includes 'Home', 'Resources', 'Pricing', 'Login', 'Contact Sales', and 'Start For Free'. The main heading reads 'The World's #1 Systematic Review Platform'. Below this, it states 'Join over 1 million researchers who trust Rayyan to organize, manage, and accelerate their systematic reviews.' and includes a 'Get Started' button. The central part of the page features a grid of device screens (laptop, tablet, smartphone) displaying the Rayyan interface. A section titled 'Trusted by researchers from' lists logos for Thero-Business, American Diabetes Association, AAD, National Pharmaceutical Council, UNIVERSITY OF MASSACHUSETTS, and IQVIA. Below this is a section 'How to Save Your Time with Rayyan' with a 'Create Your First Review' button. A detailed view of a review project is shown, featuring a table of articles with columns for title, date, and status. A callout box highlights 'AI-Powered Screening & Mobile App' with a 'Get Started Now' button.

# Rayyan

The screenshot displays the Rayyan Systematic Review interface. At the top, navigation tabs include Overview, Review data, Screening, Full text screening, and Data extraction. A notification banner reads "Stay caught up with review updates".

**Review Info**

- Review Title: AI-based Prediction of Phishing Email Susceptibility from Psychological Traces: A Systematic Review
- Review Type: Systematic Review
- Review Domain: Not Applicable
- Description: Add Description to your Review!

**Data Summary**

Imported References <b>2,865</b> Add References	Total Duplicates <b>2,776</b> Detect Duplicates	Unresolved <b>0</b> Continue Resolving	Resolved: 647 Not Duplicate: 1 Deleted: 2,128
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**Review Members**

Name	Email	Role	Status
		Owner	Active
		Reviewer	Active
		Reviewer	Active

**Screening (Blind CRT)**

**Screening Criteria**

Inclusion Criteria	Exclusion Criteria
Inclusion Criteria 2 Published 2015-2026	
Inclusion Criteria 3 English language	
Inclusion Criteria 4 Peer-reviewed journal articles, conference papers	

**Your Progress**

0%  
00hrs | 00mins | 00 Sessions  
You didn't start screening yet!  
**737**  
Articles to screen  
Start Screening

**Screening Summary**

0 Conflicts | 100% Aligned

**Team Progress**

No progress yet!

View Sessions Time



AI-based Prediction of Phishing Email Susceptibility from Psychological Traces: A Systematic Review

Overview **Review data** Screening Full text screening Data extraction

Need training? Blind mode Screening criteria

All Data Showing 737 Articles

Imported References: All References (2,695), 3rd pt3 IEEE Xplo... (14), 2nd pt2 IEEE Xplo... (93), 3rd pt2 IEEE Xplo... (100), 1st pubmed-Phish... (23)

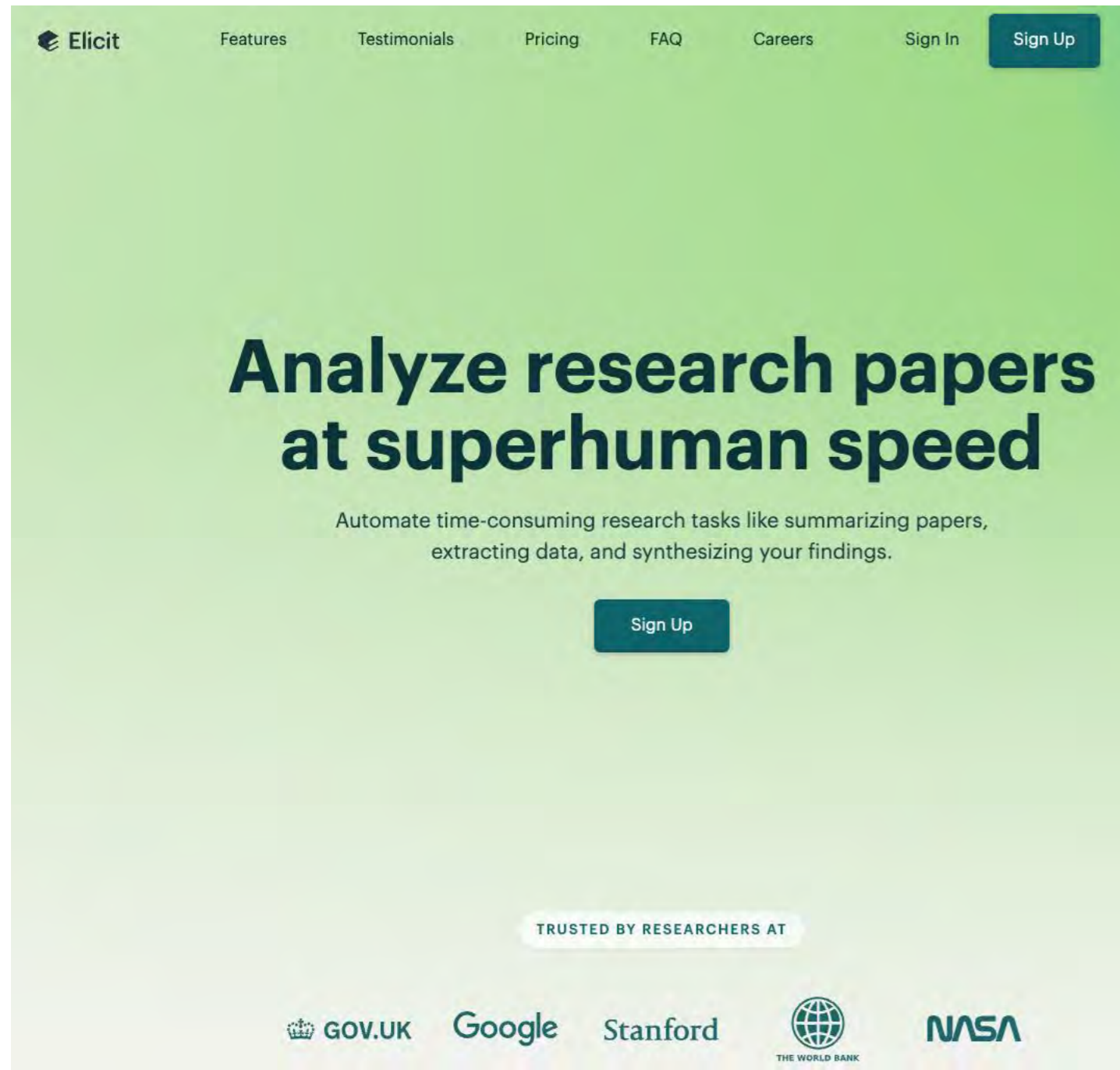
Possible Duplicates: Unresolved (0), Deleted (2,128), Not Duplicate (1), Resolved (647)

All References Table:

Title	Date	Author
1 Where to Kill the Cyber Kill-Chain: An Ontology-Driven Framework for IoT Security Analytics	2016-01-01	M. Mohsin; Z. ...
2 <b>Systematic Review</b> of E-commerce Security Issues and Customer Satisfaction Impact	2022-01-01	M. Qasaimeh; ...
3 GeoPal: Friend Spam Detection in Social Networks Using Private Location Proofs	2016-01-01	B. Carbutar; ...
4 Similarity Analysis of Ransomware based on Portable Executable (PE) File Metadata	2021-01-01	M. A. Ayub; A. ...
5 Obfusc8: LLM-Augmented PowerShell Obfuscation	2025-01-01	K. Keum; D. K. ...
6 Advanced Analysis of Email Sender Spoofing Attack and Related Security Problems	2022-01-01	B. Yu; P. Li; J. ...
7 Gamified Social Collaboration via Mesh CoP: Effectiveness in Enhancing Cybersecurity Awareness	2025-01-01	M. Warasart; ...
8 Loki: A Physical Security Key Compatible IoT Based Lock for Protecting Physical Assets	2022-01-01	S. Chakkarav...
9 Chatbots	2024-01-01	Divya Nair
10 What the App is That? Deception and Countermeasures in the Android User Interface	2015-01-01	A. Bianchi; J. ...
11 Building robust temporal user profiles for anomaly detection in file system accesses	2016-01-01	S. Mehnaz; E. ...
12 Ensure the Grid Interfaces and Payment Gateways Against Data Breach Attacks and Malware: Electric Vehicle Charging Station via Cybersecurity	2025-01-01	P. C. Karana...
13 Enhanced Anomaly Detection in Ethereum: Unveiling and Classifying Threats With <b>Machine Learning</b>	2024-01-01	A. Ehsan; Z. L. ...
14 Ensuring Security and Privacy in Digital Healthcare System	2025-01-01	Khadija; K. Sl...
15 <b>Machine Learning</b> Algorithm for Sensitive Data Classification on Cloud Environment	2025-01-01	R. Osari; R. Sl...

Filters:

- Keywords for include: phishing (499), AI (150), machine learning (137), personality (83), email phishing (14), compared with (4), randomly (3), crossover (2), randomized (2), psychological predictors (2)
- Keywords for exclude: survey (76), literature review (26), phone (17), reviews (13), SMS (12), prevalence (12), this review (9), systematic review (8), regression analyses (6), longitudinal (5)
- Labels: useful (43)

A screenshot of the Elicit website homepage. The background is a light green gradient. At the top, there is a navigation bar with links for "Features", "Testimonials", "Pricing", "FAQ", "Careers", "Sign In", and a "Sign Up" button. The main heading reads "Analyze research papers at superhuman speed" in a large, bold, dark green font. Below this, a sub-heading states "Automate time-consuming research tasks like summarizing papers, extracting data, and synthesizing your findings." A "Sign Up" button is centered below the text. At the bottom, there is a section titled "TRUSTED BY RESEARCHERS AT" followed by logos for GOV.UK, Google, Stanford, THE WORLD BANK, and NASA.

- Used to locate research results
- Ask questions wizard
- Allows you to handle complex queries that may require deep exploration of existing literature
- You can extract and synthesize specific data from documents

<https://elicit.com/>

# Elicit – Article search



A screenshot of the Elicit website interface. At the top left, there is a navigation bar with the Elicit logo, 'Recent', and 'Library' options. On the top right, there is an 'Upgrade' button, a 'Help' dropdown menu, and a user profile for 'Francisco Garcia'. The main content area features a search bar with the text 'open-education policies case studies in higher education'. Below the search bar, there is a prompt: 'More precise questions work better. Try adding elements like these:' followed by three buttons: 'Research Focus', 'Comparative Approach', and 'Specific Intervention'. A green arrow button is positioned to the right of these buttons. Below the search bar, there is a 'Quick tools' section with two options: 'Extract data from PDFs' and 'List of concepts'.

# Elicit – Article search

The screenshot shows the Elicit search results page for the query "open-education policies case studies in higher education". At the top, there is a search bar containing the query and a "Share" button. Below the search bar, a "Summary of top 4 papers" section provides a brief overview of the search results. The main part of the page is a table with columns for "Paper", "Abstract summary", and "Manage Columns". The table lists several papers, including "OpenCases: Case Studies on Openness in Education" by M. Souto-Otero, "Using Open Educational Resources for Teaching in Higher Education: A Review of Case Studies" by B. Wong, "Open Educational Practices in Australia" by Carina Bossu, "Open Educational Resources: Cases from Latin America and Europe in Higher Education" by Andrea Inamorato, "Policy Approaches to Open Education - Case Studies from 28 EU Member States (OpenEdu Policies)" by Inamorato Dos Santos and Andrea, "Survey and Reflection of Open Education Policies" by Junfeng Yang, "Openness and praxis: Exploring the use of open educational practices in higher education" by C. Cronin, and "A review of the use of open educational resources: the benefits, challenges and good practices in higher education" by B. Wong. On the right side, the "Manage Columns" panel allows users to add or remove columns from the table, with options like "Summary", "Main findings", "Methodology", "Intervention", "Outcome measured", and "Limitations".

Search box

Summary

References

More fields can be added to the analysis

# Elicit – Article search



The screenshot displays the Elicit interface with 8 selected papers. The interface includes a top navigation bar with options like 'Search citation trails', 'Delete', 'Sort: Most relevant', 'Filters', and 'Export as'. The main area shows a list of papers with their titles, authors, and abstract summaries. A 'Manage Columns' panel on the right allows users to search for or create columns to extract data from the papers. A blue arrow points from a circled 'Add a new step' button at the bottom to a detailed view of the step menu, which includes options like 'Create a new table from selected papers', 'Summarize abstracts for selected papers', 'Chat with papers', 'Ask a new question and find papers', 'Extract data from uploaded papers', and 'Get a list of concepts'. The 'Add a new step' button is highlighted with a blue circle and a blue arrow pointing to the detailed view.

# Elicit – Explore concepts



Elicit interface showing search results for "open-education policies case studies in higher education".

Search results summary:

- Found 58 papers
- Found 89 concepts in 58 papers
- Found 22 unique concepts
- Final answer

Concept	Source
<p><b>UCF faculty teaching online and face-to-face courses case studies</b> specific examples of UCF faculty's experiences and practices in teaching using open educational resources.</p>	<p>"Macro and microventures and lessons learned will be shared by both institutions ranging from perceptions of open education resources by the universities to collaborating with constituents across campus, in addition to specific case studies with UCF faculty teaching online and face-to-face courses as well as USD's stipend program.", "Open educational resources (OER) provide a high-quality and low-cost alternative to traditional textbooks." S. Norris 2017</p>
<p><b>Global Open Education Initiatives</b> a collection of case studies showcasing various universities and organizations implementing open educational resources (OER) to enhance accessibility and reduce costs in higher education.</p>	<p>"The Queensland University of Technology (QUT) has developed an Open Education (OE) initiative to support the use and creation of OER at QUT.", "Abstract The use and creation of Open Education Resources (OER) is becoming increasingly prevalent with teachers and learning designers at universities around the world." Jessica Stevens 2017</p> <p>"As the home of free learning from The Open University, we offer videos, games, interactive features, debates, podcasts and hundreds of free open courses.#", "OpenLearn: The home of free learning from The Open University: Each year, over 5 million learners explore everything from Asteroids to Zoology on OpenLearn." Sarah Bridgman 2014</p> <p>"Although 50 years have passed since the establishment of UKOU, the first open university, such institutions seem to be losing their ground, notably because they face challenges in creating a clear identity for themselves.", "By definition, they have been distinguished from traditional universities by offering both open access and open admission." Hanmo Jeong 2019</p> <p>"Launched at Carnegie Mellon University in the fall of 2002, the Open Learning Initiative (OLI) is dedicated to the development of freely available, stand-alone college-level online courses informed by the best current research from the cognitive and learning sciences.1 The OLI course-design process is unique in its dedication to teaming faculty content experts with cognitive scientists, learning scientists, human-computer interaction specialists, formative assessment specialists, and programmers.", "The initiative's commitment to ongoing course evaluation and iterative improvement also sets it apart." Candace Thille 2013</p> <p>"Carnegie Mellon's Open Learning Initiative (OLI), an open educational resources project that began in 2002 with a grant from the William and Flora Hewlett Foundation, had hoped to challenge Baumol and Bowen's dilemma by providing access to high quality education while at the same time increase productivity.", "The goal of the funder was to provide open access to high-quality post-secondary educational materials to individual learners who otherwise would be excluded or not encouraged to pursue higher education (Smith and Thille, 2004)." Oded Meyer 2018</p> <p>"A goal of this research was to see whether an institutional self-assessment tool—adapted from blended learning and institutional transformation research—can help to assess how an institution has progressed with its open education initiatives.", "The paper includes discussion of how a self-assessment tool for institutional open education practices (OEP) can be applied to OEP initiatives at an institutional level and shares promising practices and insights that emerge from this research." Tannis Morgan 2021</p> <p>"The OERu is a collaborative initiative between 12 institutions globally that is intending to offer courses free of charge to students using only OERs and open practices.", "Open Educational Resources are widely discussed in higher education circles and open education practices are being upheld as the second generation of OERs that have the potential to make education freely available to all students." A. Murphy 2012</p> <p>"The high cost and lack of availability of commercial print textbooks is a major concern for both students and their parents. To address these concerns, the Provost's Office and the University Libraries of the University of Massachusetts Amherst launched the Open Education Initiative in the Spring of 2011, having saved over \$750,000 to date. This model has an implementation strategy that is easy for others to adopt.", "National Political Climate Increased attention to cost of higher education Increased attention to student debt (student loans) Increased attention to cost of textbooks Campus Political Climate – FY 2010/2011 Decreased state funding of campus Increased tuition/fees for students Why the Academic Library? Form a nexus of communication Create strategic partnerships Promote Open Access initiatives Curate digital materials Provide expertise on metadata, author rights, fair use rights, copyright Provide expertise on content, accessibility Provide education and workshops Support from the Provost Demonstrate efforts to contain the costs of higher education Involve faculty in the conversation Gain support from the student community" M. Billings 2014</p> <p>"The California Community College system launched the Online Education Initiative in 2014 to address the needs of students and to more effectively leverage the collective resources of the 113 campuses to provide the services needed for degree completion and transfer to university.", "Providing a common base of instructional technology resources, student services, and a statewide exchange of courses, and with all of this being universally accessible, the Online Education Initiative is one of the most ambitious efforts to address the needs of online students and educators in the history of California." M. Johnson 2015</p> <p>"Comprised of faculty from California's three public higher education systems, the CAOERC conducted a field study of 16 faculty using OER materials to discover practical knowledge about the challenges of adopting OER textbooks.", "The California Open Educational Resources Council (CAOERC) was formed in 2014 to find solutions to reduce the cost of college textbooks without impacting quality." Ruth A. Guthrie 2018</p> <p>"The University of Cape Town recently signed the Cape Town Open Education Declaration signalling its intent to make some of its traditional face-to-face teaching materials and processes available as OER.", "In an extraordinary, yet paradoxical development, increasing numbers of traditional and distance universities are using ICTs to make a collection of their teaching resources freely available to open educational resources (OER)." C. Heppner, M. Williams, S. E. Spary 2018</p>

# Elicit – Explore concepts



open-education policies case studies in higher education

- Found 58 papers
- Found 89 concepts in 58 papers
- Found 22 unique concepts
- Final answer

CSV UPGRADE

Concept	Source
<b>UCF faculty teaching online and face-to-face courses case studies</b> specific examples of UCF faculty's experiences and practices in teaching using open educational resources.	"Macro and microventures resources by the university faculty teaching online and a high-quality and low-cost alternative to traditional textbooks." S. Norris 2017
<b>Global Open Education Initiatives</b> a collection of case studies showcasing various universities and organizations implementing open educational resources (OER) to enhance accessibility and reduce costs in higher education.	"The Queensland University of Technology (QUT) has developed an Open Education (OE) initiative to support the use and creation of OER at QUT.", "Abstract The use and creation of Open Education Resources (OER) is becoming increasingly prevalent with teachers and learning designers at universities around the world." Jessica Stevens 2017

Elicit Recent Library

← Back

**A Tale of Two Campuses: Open Educational Resources in Florida and California Academic Institutions**

S. Norris, John Raible, Alejandra Nann, Julia L. Hess  
2017 · 1 citation

Source DOI Plain text PDF

**University of Central Florida (UCF) and the University of San Diego (USD) efforts related to OER and textbook affordability**

initiatives undertaken by UCF and USD to promote open educational resources and improve textbook affordability.

**UCF faculty teaching online and face-to-face courses case studies**

specific examples of UCF faculty's experiences and practices in teaching using open educational resources.

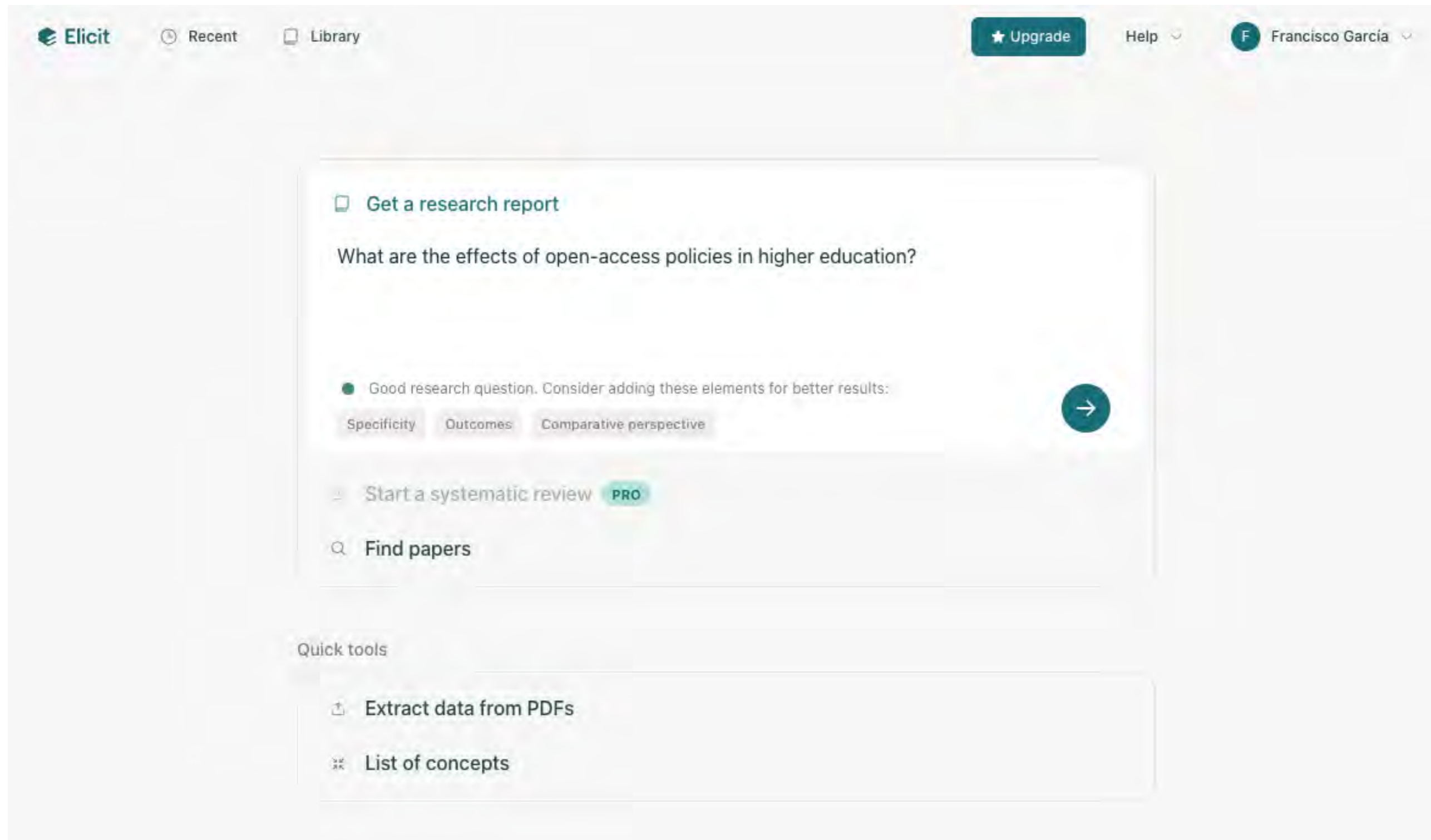
RELEVANT QUOTES 1 of 2 Copy

**USD's stipend program**

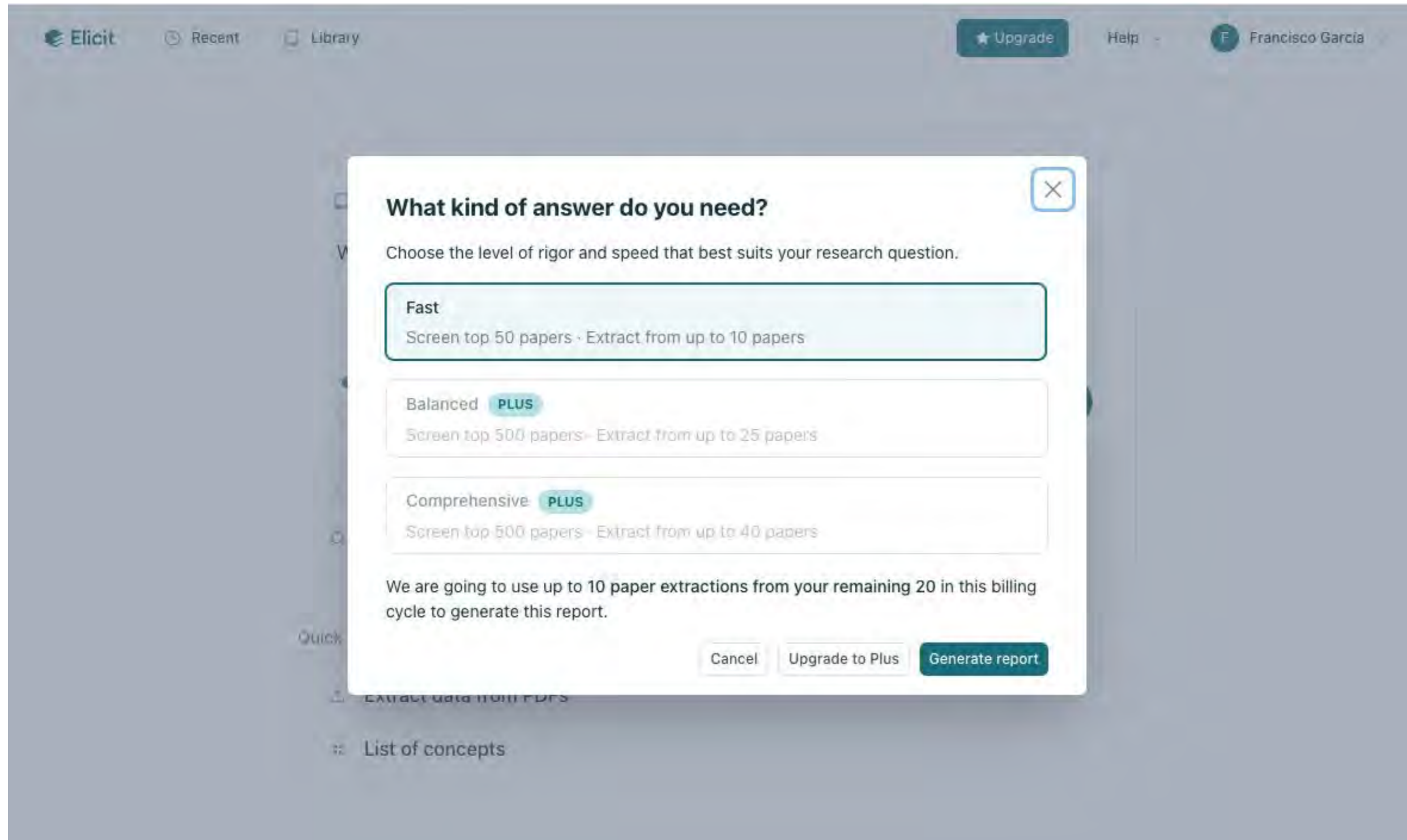
a financial support initiative by USD aimed at promoting the use of open educational resources.

Open educational resources (OER) provide a high-quality and low-cost alternative to traditional textbooks. The University of Central Florida (UCF) and the University of San Diego (USD) have been engaged in a multitude of efforts related to OER and textbook affordability. This article will discuss the textbook affordability climate at the state (Florida and California) and institutional (UCF and USD) level. Macro and microventures and lessons learned will be shared by both institutions ranging from perceptions of open education resources by the universities to collaborating with constituents across campus, in addition to specific case studies with UCF faculty teaching online and face-to-face courses as well as USD's stipend program. Lastly, the article will discuss future developments and continuous improvements by educating UCF and USD campus communities through several initiatives and new partnerships with stakeholders.

# Elicit – Explore a research question

A screenshot of the Elicit web application interface. The top navigation bar includes the Elicit logo, 'Recent', 'Library', an 'Upgrade' button, 'Help', and a user profile for 'Francisco Garcia'. The main content area features a 'Get a research report' section with the question 'What are the effects of open-access policies in higher education?'. Below this, a green dot indicates a 'Good research question' with suggestions for 'Specificity', 'Outcomes', and 'Comparative perspective'. Other options include 'Start a systematic review' (marked 'PRO') and 'Find papers'. A 'Quick tools' section at the bottom lists 'Extract data from PDFs' and 'List of concepts'.

# Elicit – Explore a research question



The screenshot shows the Elicit web application interface. At the top, there is a navigation bar with the Elicit logo, 'Recent', 'Library', an 'Upgrade' button, 'Help', and a user profile for 'Francisco Garcia'. A modal dialog titled 'What kind of answer do you need?' is open in the center. The dialog contains the following text: 'Choose the level of rigor and speed that best suits your research question.' Below this are three options: 'Fast' (Screen top 50 papers · Extract from up to 10 papers), 'Balanced PLUS' (Screen top 500 papers · Extract from up to 25 papers), and 'Comprehensive PLUS' (Screen top 500 papers · Extract from up to 40 papers). At the bottom of the dialog, there is a message: 'We are going to use up to 10 paper extractions from your remaining 20 in this billing cycle to generate this report.' and three buttons: 'Cancel', 'Upgrade to Plus', and 'Generate report'.

# Elicit – Explore a research question



Elicit interface showing the 'Screen papers' step. The main panel displays a table of screening criteria with progress indicators.

Column	Definition	Criteria matches (yes/maybe/no)
<b>Setting</b>	Was the study conducted in a higher education institution (university or college)?	28 / 12 / 4
<b>Policy Level</b>	Does the study examine institutional-level open-access policies (rather than individual journal policies or practices)?	5 / 13 / 26
<b>Study Design</b>	Is the study an empirical investigation (quantitative, qualitative, mixed methods) or a systematic review/meta-analysis?	16 / 11 / 17
<b>Outcomes</b>	Does the study measure at least one of the following: research visibility, citation impact, institutional costs, or faculty compliance with open-access policies?	6 / 5 / 33
<b>Infrastructure</b>	Does the study analyze institutional repositories or open-access publishing platforms?	4 / 7 / 33
<b>Evidence Base</b>	Does the study present original data or analysis (rather than just opinion or theory)?	16 / 7 / 21
<b>Scope</b>	Does the study focus on research outputs (rather than educational materials or K-12 education)?	19 / 9 / 16

The right sidebar shows the 'Report' progress: Gather papers (50 papers found), Screen papers (Filtering studies based on inclusion criteria), Extract data, and Generate report (Summarizing findings).

Elicit interface showing the 'Extract data' step. The main panel displays extracted data points and criteria.

**Data points extracted** 30  
Capturing key data and findings from papers using the following criteria

Column	Definition	Most recent extraction
<b>Study Design</b>	Identify and record the specific type of study design used: - Descriptive study - Longitudinal study - Survey - Comparative analysis - Mixed-methods study	Descriptive study
<b>Institutional Context</b>	Extract details about the institutional setting: - Type of institution (e.g., university, research institute) - Geographic region/country - Number of institutions studied - Disciplinary scope (if specified)	- Type of institution: University (land grant institution) - Geographic region/country: United States (Oregon) - Number of institutions studied: 1 (Oregon State University) - Disciplinary scope: Broad, involving various colleges and departments within OSU
<b>Open Access Policy Characteristics</b>	Identify and record specific details about the open access policy: - Mandatory or voluntary policy - Scope of policy (institution-wide, department-specific) - Primary mechanism of implementation (mandate, incentive,	- Mandatory policy - Scope: Institution-wide (e.g., Southampton, Harvard, Stanford, MIT) and research funders (e.g., UK Research Funding Councils, US NIH)

The right sidebar shows the 'Report' progress: Gather papers (50 papers found), Screen papers (5 papers included), Extract data (30 data points extracted), and Generate report (Summarizing findings).

# Elicit – Explore a research question



The screenshot displays the Elicit web application interface. At the top, there is a navigation bar with 'Elicit', 'Recent', and 'Library' on the left, and 'Upgrade', 'Help', and a user profile 'Francisco Garcia' on the right. Below the navigation bar, the main content area is titled 'Effects of Open-Access Policies in Higher Education'. A progress indicator shows 'Research report' with 'View only' permissions. A 'Share' button is visible in the top right corner of the main area.

The main content area is divided into two sections. The top section, titled 'Effects of Open-Access Policies in Higher Education', contains a message: 'Elicit is building and refining understanding of the research. Your report will become available once all steps are complete. We will email fgarcia2006@gmail.com when your report is ready (less than 10 minutes)'. Below this is a 'Generate report' button with a timer showing '0:33 elapsed (5 minutes estimated)'. A large grey box with a document icon and the text 'Drafting abstract...' is centered below the button.

The bottom section of the main area is a list of search results and criteria. It includes three main categories:

- Identified 50 relevant papers using search**
- Screened in 5 papers utilizing criteria**
  - Setting
  - Policy Level
  - Study Design
  - Outcomes
  - Infrastructure
  - Evidence Base
  - Scope
- Extracted 30 data points covering**
  - Study Design
  - Institutional Context
  - Open Access Policy Characteristics
  - Open Access Implementation Strategies
  - Open Access Performance Metrics
  - Barriers and Facilitators

On the right side of the interface, there is a 'Report' sidebar. It shows the 'Status' of the report with a progress indicator and a list of steps:

- Gather papers (50 papers found)
- Screen papers (5 papers included)
- Extract data (30 data points extracted)
- Generate report (Summarizing findings)

Below the report sidebar is a 'Chat' section with a message: 'Hang tight — you'll be able to chat with this report once it's generated'.



# Elicit – Explore a research question

The screenshot shows the Elicit web application interface. At the top, there is a navigation bar with 'Elicit', 'Recent', and 'Library' on the left, and 'Upgrade', 'Help', and a user profile 'Francisco Garcia' on the right. Below the navigation bar, the title of the report is 'Effects of Open-Access Policies in Higher Education'. The main content area on the left contains the report's abstract and a table of included studies. The right sidebar, titled 'Report', shows a progress list: 'Gather papers' (50 papers found), 'Screen papers' (5 papers included), 'Extract data' (30 data points extracted), and 'Generate report' (with a 'Save PDF' button). Below the progress list is a 'Chat' section with a text input field and a send button.

**Effects of Open-Access Policies in Higher Education**

MARCH 7, 2025

Open-access policies in higher education, when implemented as mandatory institutional mandates, significantly increase repository deposit rates and citation counts compared to voluntary approaches.

**ABSTRACT**

Open access policies in higher education are most often implemented as mandatory, institution-wide mandates that require faculty to deposit work into institutional repositories. \* Studies report that such mandates yield compliance rates of 60% versus 15% with voluntary self-selection. \* In one case, targeted outreach increased deposit rates from 11% to 45%, and top-performing universities show deposit levels between 80% and 90%. \* One study comparing citation counts found that open access articles consistently attract more citations—despite concerns about self-selection bias—across diverse fields. \* Institutional adoption patterns vary, with examples ranging from 51 to 1,207 institutions and influenced by factors such as library leadership, faculty governance, funder requirements, and regional infrastructure. \*

**METHODS**

We analyzed 5 papers from an initial pool of 50, using 7 screening criteria. Each paper was reviewed for 6 key aspects that mattered most to the research question. [More on methods](#)

**RESULTS**

**Characteristics of Included Studies**

Study	Study Design	Geographic Region	Institution Type
Fruin and Sutton, 2016	Survey *	North America (United States and Canada) *	Educational institutions (universities) *
Gargouri et al., 2010	Comparative analysis *	United Kingdom, USA, Switzerland *	Universities and research institute *
Huang et al., 2020	Longitudinal study and comparative analysis *	Global (including Latin America, Africa, Europe, North America, Oceania, Asia) *	Universities *

# Elicit – Explore a research question



The screenshot displays the Elicit web application interface. At the top, there's a browser window with the title 'Elicit - Effects of Open-Access Policies in Higher Education'. Below the browser window, there's a navigation bar with 'Todas las herramientas', 'Editar', 'Convertir', and 'Firma electrónica'. A search bar contains 'Buscar texto o herramientas' and a 'Compartir' button. On the left, a sidebar titled 'Todas las herramientas' lists various actions like 'Crear un PDF', 'Combinar archivos', 'Exportar a PDF', etc. The main content area shows the title 'Effects of Open-Access Policies in Higher Education' and its abstract. Below the abstract, there are sections for 'Paper search' and 'Screening'. The 'Screening' section lists criteria used to filter papers, such as 'Setting', 'Policy Level', 'Study Design', 'Outcomes', 'Infrastructure', 'Evidence Base', and 'Scope'. The 'Data extraction' section shows instructions for a large language model to extract data from the papers. On the right, a 'Marcadores' sidebar shows the current document and its sections. At the bottom right, there's a vertical toolbar with navigation and search icons.

**Effects of Open-Access Policies in Higher Education**

Open-access policies in higher education, when implemented as mandatory institutional mandates, significantly increase repository deposit rates and citation counts compared to voluntary approaches.

**Abstract**

Open access policies in higher education are most often implemented as mandatory, institution-wide mandates that require faculty to deposit work into institutional repositories. Studies report that such mandates yield compliance rates of 60% versus 15% with voluntary self-selection. In one case, targeted outreach increased deposit rates from 11% to 45%, and top-performing universities show deposit levels between 80% and 90%. One study comparing citation counts found that open access articles consistently attract more citations—despite concerns about self-selection bias—across diverse fields. Institutional adoption patterns vary, with examples ranging from 51 to 1,207 institutions and influenced by factors such as library leadership, faculty governance, funder requirements, and regional infrastructure.

**Paper search**

Using your research question "What are the effects of open-access policies in higher education?", we searched across over 126 million academic papers from the Semantic Scholar corpus. We retrieved the 50 papers most relevant to the query.

**Screening**

We screened in papers that met these criteria:

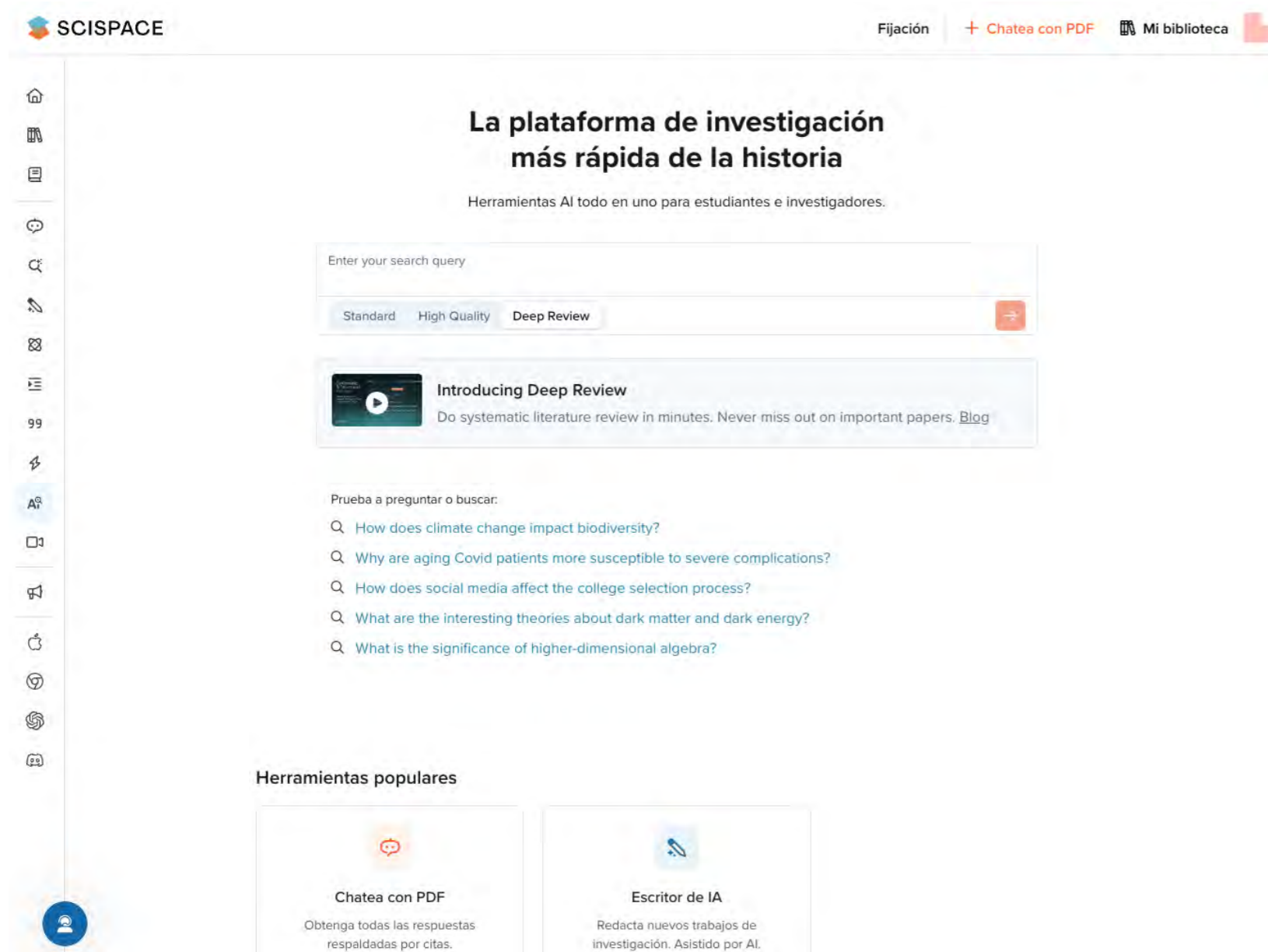
- **Setting:** Was the study conducted in a higher education institution (university or college)?
- **Policy Level:** Does the study examine institutional-level open-access policies (rather than individual journal policies or practices)?
- **Study Design:** Is the study an empirical investigation (quantitative, qualitative, mixed methods) or a systematic review/meta-analysis?
- **Outcomes:** Does the study measure at least one of the following: research visibility, citation impact, institutional costs, or faculty compliance with open-access policies?
- **Infrastructure:** Does the study analyze institutional repositories or open-access publishing platforms?
- **Evidence Base:** Does the study present original data or analysis (rather than just opinion or theory)?
- **Scope:** Does the study focus on research outputs (rather than educational materials or K-12 education)?

We considered all screening questions together and made a holistic judgement about whether to screen in each paper.

**Data extraction**

We asked a large language model to extract each data column below from each paper. We gave the model the extraction instructions shown below for each column.

- **Study Design:**  
Identify and record the specific type of study design used:



The screenshot shows the SCISpace website interface. At the top, there is a navigation bar with the SCISPACE logo, a 'Fijación' button, a '+ Chatea con PDF' button, and a 'Mi biblioteca' button. The main content area features a search bar with the text 'Enter your search query' and three filter buttons: 'Standard', 'High Quality', and 'Deep Review'. Below the search bar, there is a section titled 'Introducing Deep Review' with a play button icon and the text 'Do systematic literature review in minutes. Never miss out on important papers. [Blog](#)'. Underneath, there is a section titled 'Prueba a preguntar o buscar:' with five search suggestions: 'How does climate change impact biodiversity?', 'Why are aging Covid patients more susceptible to severe complications?', 'How does social media affect the college selection process?', 'What are the interesting theories about dark matter and dark energy?', and 'What is the significance of higher-dimensional algebra?'. At the bottom, there is a section titled 'Herramientas populares' with two cards: 'Chatea con PDF' (Obtenga todas las respuestas respaldadas por citas.) and 'Escritor de IA' (Redacta nuevos trabajos de investigación. Asistido por AI.).

- Bibliographic reference search engine
- You can work on a specific pdf, interacting with questions with a chatbot
- It helps to understand complex texts, empirical studies, tables, etc.
- Includes a citation generator that supports several different styles

<https://scispace.com/es>

# SCISpace – Exploring a research question



The screenshot shows the SCISpace website interface. At the top left is the SCISPACE logo. On the top right, there are navigation links: "Fijación", "+ Chatea con PDF", and "Mi biblioteca". A vertical sidebar on the left contains various icons for navigation. The main content area features a large heading: "La plataforma de investigación más rápida de la historia" and a sub-heading: "Herramientas AI todo en uno para estudiantes e investigadores." Below this is a search bar containing the text: "I look for insights of experiences applying open-access policies in higher education". Under the search bar are three filter buttons: "Standard", "High Quality", and "Deep Review", along with a red search button. Below the search bar, there is a section titled "Prueba a preguntar o buscar:" followed by a list of suggested research questions:

- Q What are the key factors influencing the adoption and implementation of open-access policies in higher education institutions?
- Q How do open-access policies impact the dissemination of research findings and their potential applications in various fields?
- Q What are the benefits and challenges of implementing open-access policies in higher education, and how can they be addressed?

Below the list, there is a suggestion: "Sugerencia: Si haces una pregunta, agrega un signo de interrogación (?) al final para obtener mejores resultados." and a list of more suggested questions:

- Q How does social media affect the college selection process?
- Q What are the interesting theories about dark matter and dark energy?
- Q What is the significance of higher-dimensional algebra?

# SCISpace – Exploring a research question



The screenshot shows the SCISpace web interface. At the top left is the SCISPACE logo. A search bar contains the text "Papers" and "Get insights from top papers directly". Navigation links for "Pricing", "Chat with PDF", and "My Library" are visible. The main content area shows a search history entry: "My Searches / I look for insights of experiences applying open-access policies in hi...". Below this, a "Research Steps" panel is active, displaying the query "I look for insights of experiences applying open-access policies in higher education". A message states: "I have enhanced the query with your inputs, you can 'Submit' directly or further make changes and submit." An "Enhanced Query" section shows the same query in a text box with a "Submit Now" button. Below this, a prompt asks the user to enhance the query by answering two questions:

- Are you interested in the impact of open-access policies on students, faculty, or administrative processes within higher education?
- Would you like to focus on specific types of open-access policies, such as those related to research publications, educational resources, or data sharing in higher education?

At the bottom of the panel, there is a text input field with the placeholder "Enter your instructions here to enhance query" and a plus icon button.

# SCISpace – Exploring a research question



The screenshot shows the SCISpace web interface. At the top, there is a search bar with the text "Search or ask a question" and a magnifying glass icon. To the right of the search bar are links for "Pricing", "Chat with PDF", and "My Library". Below the search bar, the interface displays a search history entry: "My Searches / I look for insights of experiences applying open-access policies in hi...". The main content area is titled "Research Steps" and shows a step that is 50% done. The step is "Performing Steps (takes upto 3 minutes)". The progress bar is yellow and shows "50% Done". The step description is "Executing multiple relevant queries to broaden the search." Below this, there is a list of search results:

- insights of experiences applying open-access policies in higher education
- challenges and benefits of implementing open-access policies in higher education institutions
- impact of open-access policies on academic collaboration and knowledge sharing in higher education
- exploring the technological advancements and institutional strategies influencing the adoption of open-access policies in higher education
- experiences and perspectives of faculty and administrators on implementing open-access policies in higher education

Below the search results, there is a section for "Identifying filters specified in your query." with the filter "Open-access papers". At the bottom, there is a section for "Finding relevant papers for each query with applied filters".

# SCISpace – Exploring a research question



SCISPACE Papers Get insights from top papers directly Pricing + Chat with PDF My Library

My Searches / Insights of experiences applying open-access policies in higher edu... Saved 3 mins ago Standard High Quality Deep Review en

Research Steps  
Deep Review has analyzed 1750 papers, and found 340 papers relevant to your query.

Answer from top 20 papers

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**Insights of Experiences Applying Open-Access Policies in Higher Education**

- Introduction
- Key Insights from OA Policy Implementation
- Challenges in OA Policy Implementation
- Strategies for Successful OA Policy Implementation
- Comparative Analysis of OA Policy Implementation
- Conclusion

**Insights of Experiences Applying Open-Access Policies in Higher Education**

**Introduction**

Open-access (OA) policies have become a cornerstone of modern higher education, aiming to democratize knowledge and enhance research dissemination. Institutions worldwide have adopted various strategies to implement OA policies, each facing unique challenges and opportunities. This response synthesizes insights from 20 research papers to provide a comprehensive overview of experiences with OA policies in higher education, highlighting key successes, challenges, and strategies for effective implementation.

**Key Insights from OA Policy Implementation**

**Faculty Perspectives and Engagement**

Faculty attitudes toward OA policies vary widely, influenced by disciplinary differences and individual perceptions. While some scholars appreciate the increased visibility and citation counts associated with OA publishing, others express skepticism about the quality of OA journals and the business models behind them (Scott et al., 2023). These perspectives underscore the need for flexible, iterative approaches to OA policies that accommodate diverse stakeholder needs.

**Role of Academic Libraries**

Academic libraries play a pivotal role in OA policy implementation. They often serve as the primary advocates for OA, providing infrastructure and support for institutional repositories. For instance, the University of Colorado Boulder leveraged its library's expertise to develop workflows that increased repository content, demonstrating the importance of library leadership in fostering OA adoption (Johnson et al., 2019) (Kern & Wisnietzky, 2014).

SCISPACE Papers Get insights from top papers directly Pricing + Chat with PDF My Library

(Johnson et al., 2019).

**Aligning Policies with Institutional Missions**

Successful OA policies align with an institution's mission and values. For example, Duke University's OA policy reflects a commitment to societal benefit and global access, resonating with its academic community (Smith, 2012).

**Comparative Analysis of OA Policy Implementation**

Institution	Key Strategies	Outcomes and Challenges
University of Colorado Boulder	DOAJ workflow, liaison outreach, collaborative relationships	754 articles deposited, 91 through liaison outreach; required flexibility and communication (Johnson et al., 2019)
University of Edinburgh	Rights-retention policy, clear messaging	High compliance rates, enhanced research visibility (Tate, 2022)
Royal Holloway University	Advocacy, APC management, compliance monitoring	Improved compliance, managed financial challenges (Pontika & Rozenberga, 2015)
Chalmers University of Technology	Mandated Green OA, library support, new department formation	Increased repository content, cultural shift ongoing (Gilbert et al., 2011)
McMaster University	Collaborative library systems, harmonized support	Unified OA resources, improved researcher support (Smith et al., 2019)

**Conclusion**

The implementation of OA policies in higher education is a complex yet rewarding endeavor. Institutions must navigate varied faculty perspectives, infrastructure challenges, and compliance issues while leveraging collaborative strategies and clear communication. By aligning policies with institutional missions and fostering a culture of openness, higher education can fully realize the benefits of OA, enhancing research impact and societal access.

Read Less

Save to Notebook APA, Bullets Find Topics

# SCISpace – Exploring a research question



The screenshot displays the SCISpace interface. At the top, there's a search bar with the text "Papers" and "Get insights from top papers directly". To the right, there are links for "Pricing", "Chat with PDF", and "My Library". Below the search bar, there are filters for "Add columns (1)", "PDF", "Open Access", "Year", and "More filters". The main content area is divided into three columns: "Papers (20)", "Insights", and "Create or add columns".

**Papers (20)**

- 1. Exploring faculty perspectives on open access at a medium-sized, American doctoral university**  
Rachel E. Scott, Julie A. Murphy, Chad E. Buckley +1 more  
1 Jan 2023 - Insights: The UKSG Journal  
65
- 2. Adopting an Open Access Policy at a Four-Year Comprehensive College**  
Mary Jo Orzech, Kim L. Myers  
1 Jan 2020  
Request PDF, Chat, 66
- 3. The Challenging State of University Campus and Library Open Access Policies**  
Paul J. Johnson, Ellen Dubinsky  
26 May 2022 - Journal of Librarianship and Scholarly Communication  
66

**Insights**

- 1. Exploring faculty perspectives on open access at a medium-sized, American doctoral university**  
The paper highlights that faculty experiences with open access (OA) policies in higher education are mixed, with many recognizing the benefits of increased visibility and accessibility of their work. However, challenges such as high article processing charges (APCs) and skepticism about the quality of OA journals persist. Faculty express a preference for peer-reviewed sources and often feel conflicted about OA publishing, balancing the desire for open access with concerns over funding and the reputation of OA journals in their fields.
- 2. Adopting an Open Access Policy at a Four-Year Comprehensive College**  
The paper provides insights into implementing an open access policy at a four-year public college, emphasizing the importance of encouraging faculty to deposit their journal articles in an online repository. This approach aims to improve access and availability, increase citation counts, and enhance the institution's profile. The authors share lessons learned throughout the process and offer suggestions for other institutions pursuing similar initiatives, highlighting the benefits of greater openness in higher education.
- 3. The Challenging State of University Campus and Library Open Access Policies**  
The study reveals that experiences with open-access (OA) policies in higher education vary significantly across institutions. Key insights include the importance of faculty champions for policy adoption, the role of librarians in managing institutional repositories, and the necessity of ongoing commitment to sustain these initiatives. Successful strategies identified include enlisting faculty involvement, performing librarian outreach, and maintaining consistent OA messaging.

**Create or add columns**

Create your own custom column or select from the list of suggestions

- Create new column
- + TL;DR
- + Conclusions
- + Summarized Abstract
- + Results
- + Summarized Introduction
- + Methods Used
- + Literature Survey
- + Limitations
- + Contributions
- + Practical Implications
- + Objectives
- + Findings
- + Research Gap
- + Future Research
- + Dependent Variables
- + Independent Variables
- + Dataset
- + Population Sample
- + Problem Statement
- + Challenges
- + Applications



# Example of dialogue with SciSpace Copilot

SCISPACE Search papers, authors, topics and more

Chrome Extension Discover My Library

Home / My Library / Untitled collection / versionPublicada.pdf

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

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COMPUTERS & EDUCATION

Computers & Education 44 (2005) 301–325

www.elsevier.com/locate/compedu

ELSEVIER

## Educational hypermedia resources facilitator

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Received 18 February 2003; accepted 10 February 2004

**Abstract**

Within the university the introduction of computers is creating a new criterion of differentiation between those who as a matter of course become integrated in the technocratic trend deriving from the daily use of these machines and those who become isolated by not using them. This difference increases when computer science and communications merge to introduce virtual educational areas, where the conjunction of teacher and pupil in the space–time dimension is no longer an essential requirement, and where the written text is replaced (or rather complemented) by the digital text.

In this article, a historical defence is made of the presence of this new standard in the creation of digital educational resources such as the hyperdocument, as well as the barriers and technological problems deriving from its use. Furthermore, HyCo, an authoring tool, is introduced which facilitates the composition of hypertexts, which are stored as semantic learning objects, looking for that through of a simple and extremely intuitive interface and interaction model, any teacher with a minimum knowledge of computer science has the possibility of transforming his or her experience and knowledge into useful and quality hypermedia educational resources.

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**Keywords:** Authoring tool; Hypermedia educational resources development; Human–computer interaction; Open hypermedia system; Semantic learning object

Copilot English

Literature survey of this paper

The paper includes a literature review comparing HyCo, the authoring tool proposed in the paper, with other hypermedia authoring tools. The comparison is based on five dimensions: open hypermedia compliant systems, design metaphors used to create the systems, ...Read more

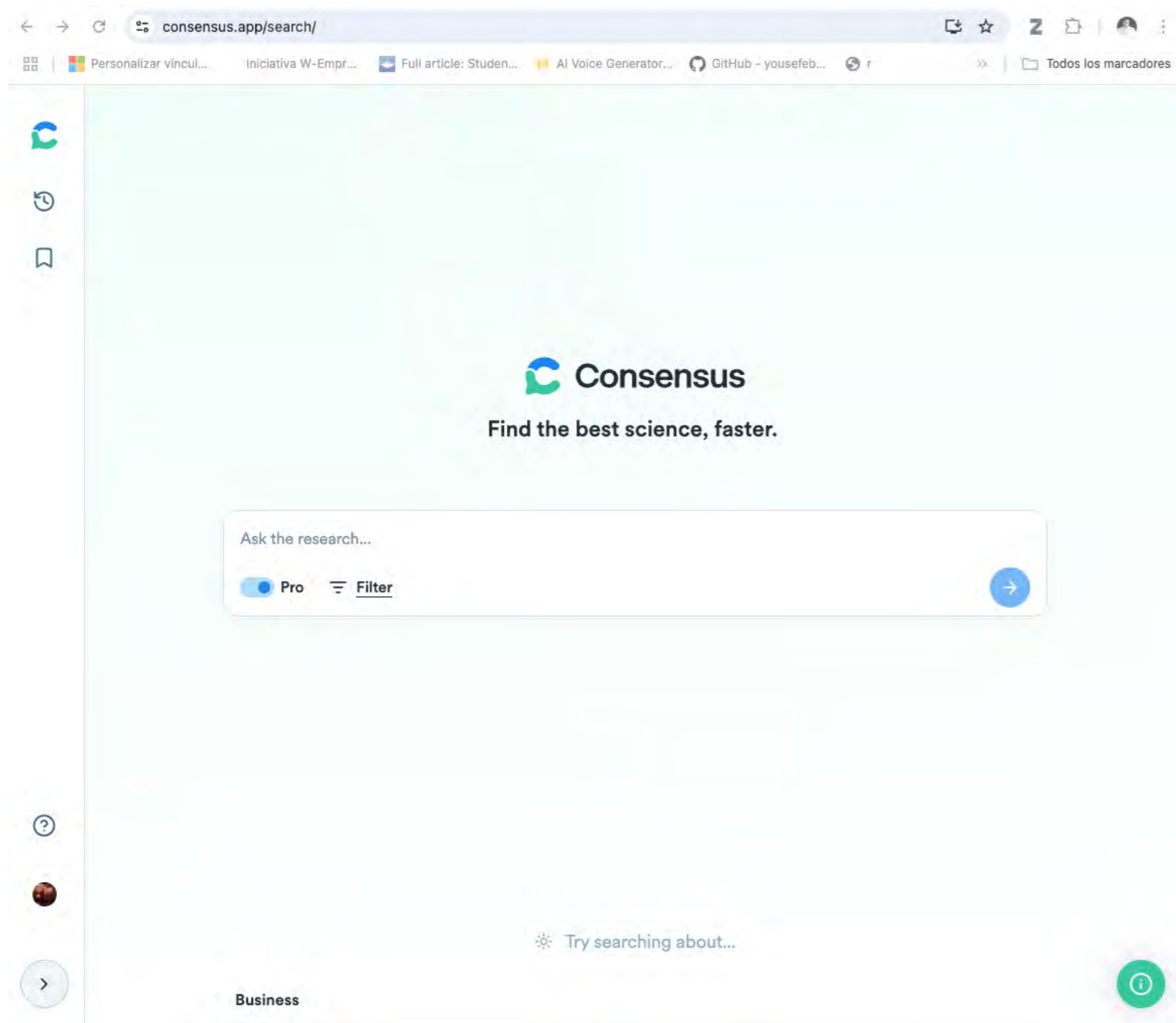
Conclusions from the paper

The paper concludes that the introduction of hypermedia environments in education changes the role of the teacher from a mere transmitter of knowledge to that of an organizer of activities and learning, giving the student greater autonomy and responsibility in the quest for learning. The paper also highlights the barrier that information technologies impose on many teachers, who find themselves technologically ostracized and become shut out of current educational processes. The authors propose HyCo, an authoring tool that facilitates the composition of hypertexts, which are stored as semantic learning objects, to help teachers transform their experience and knowledge into useful and quality hypermedia educational resources.

Explain Abstract of this paper in 2 lines, W

Write your question...

# Consensus



- Find research results
- Analyze and summarize academic papers
- Search a database of scientific publications and extract documents that match the search criteria
- Uses methods to assess how consensual the findings or opinions are in retrieved documents

<https://consensus.app/>

# Consensus – Exploring a research question



The screenshot shows the Consensus search interface in a browser. The address bar displays "consensus.app/search/". The browser's tab bar shows several open tabs, including "Personalizar víncul...", "Iniciativa W-Empr...", "Full article: Studen...", "AI Voice Generator...", and "GitHub - yousefeb...". The main content area features the Consensus logo and the tagline "Find the best science, faster." Below this is a search input field containing the text "I want to know the state-of-the-art of the open-access policies in higher education". To the left of the search button are options for "Pro" (selected) and "Filter". A blue arrow button is on the right of the search bar. At the bottom of the page, there is a "Business" label and a "Try searching about..." prompt with a magnifying glass icon. A sidebar on the left contains navigation icons for home, search, and a menu.



# Consensus – Exploring a research question

consensus.app/results?q=I%20want%20to%20know%20the%20state-of-the-art%20of%20the%20open-access%20policies%20in%20higher%20education&...

I want to know the state-of-the-art of the open-access policies in higher education

Pro Filter

State-of-the-Art of Open Access Policies in Higher Education

**Global Perspectives on Open Access Policies**

Open access (OA) policies in higher education are gaining traction worldwide, with varying levels of implementation and success. The Budapest Open Access Initiative, launched in 2002, marked a significant milestone in the global movement towards unrestricted access to scholarly communication, advocating for the "green and gold" routes and Creative Commons licenses 7 8. This initiative has influenced many higher education institutions to develop suitable infrastructures and policies to make research outputs more accessible 7 8.

**Regional Insights**

**United Arab Emirates**

In the UAE, higher education institutions (HEIs) show a low commitment to OA, with limited OA policies, funding, and institutional repositories. The perceived lack of urgency to transition from traditional access models and the minimal consideration of OA in academic promotions highlight the challenges faced in this region 1.

**North America**

North American educational institutions have been actively pursuing OA policies, with academic libraries playing a crucial role in their development and implementation. Surveys from 51 institutions reveal that these policies are essential for strategic decision-making and addressing faculty concerns 2.

**Brazil**

Brazil has made significant strides in advancing open education policies, despite challenges such as limited infrastructure and unequal resource distribution. Governmental funding supports most Open Educational Resources (OER) initiatives, and recent regulations mandate open licenses for work funded by the Open University of Brazil 6.

**United Kingdom**

In the UK, the introduction of policies by Research Councils UK (RCUK) and the Higher Education Funding Council for England (HEFCE) has necessitated new practices among HEIs. These include managing article processing charges and ensuring compliance with OA mandates, which have significantly influenced academic engagement with OA 9 10.

**Policy Components and Implementation**

Policies often include components such as open access to educational resources and open educational practices, which define objectives and actions for promoting openness in education 3. The focus on open access to theses and scholarly publications aims to enhance the impact and quality of research by making it more accessible to the broader community 5.

I want to know the state-of-the-art of the open-access policies in higher education

Pro Filter

State-of-the-Art of Open Access Policies in Higher Education

**Global Perspectives on Open Access Policies**

Open access (OA) policies in higher education are gaining traction worldwide, with varying levels of implementation and success. The Budapest Open Access Initiative, launched in 2002, marked a significant milestone in the global movement towards unrestricted access to scholarly communication, advocating for the "green and gold" routes and Creative Commons licenses 7 8. This initiative has influenced many higher education institutions to develop suitable infrastructures and policies to make research outputs more accessible 7 8.

**Regional Insights**

**United Arab Emirates**

In the UAE, higher education institutions (HEIs) show a low commitment to OA, with limited OA policies, funding, and institutional repositories. The perceived lack of urgency to transition from traditional access models and the minimal consideration of OA in academic promotions highlight the challenges faced in this region 1.

**North America**

North American educational institutions have been actively pursuing OA policies, with academic libraries playing a crucial role in their development and implementation. Surveys from 51 institutions reveal that these policies are essential for strategic decision-making and addressing faculty concerns 2.

**Brazil**

Brazil has made significant strides in advancing open education policies, despite challenges such as limited infrastructure and unequal resource distribution. Governmental funding supports most Open Educational Resources (OER) initiatives, and recent regulations mandate open licenses for work funded by the Open University of Brazil 6.

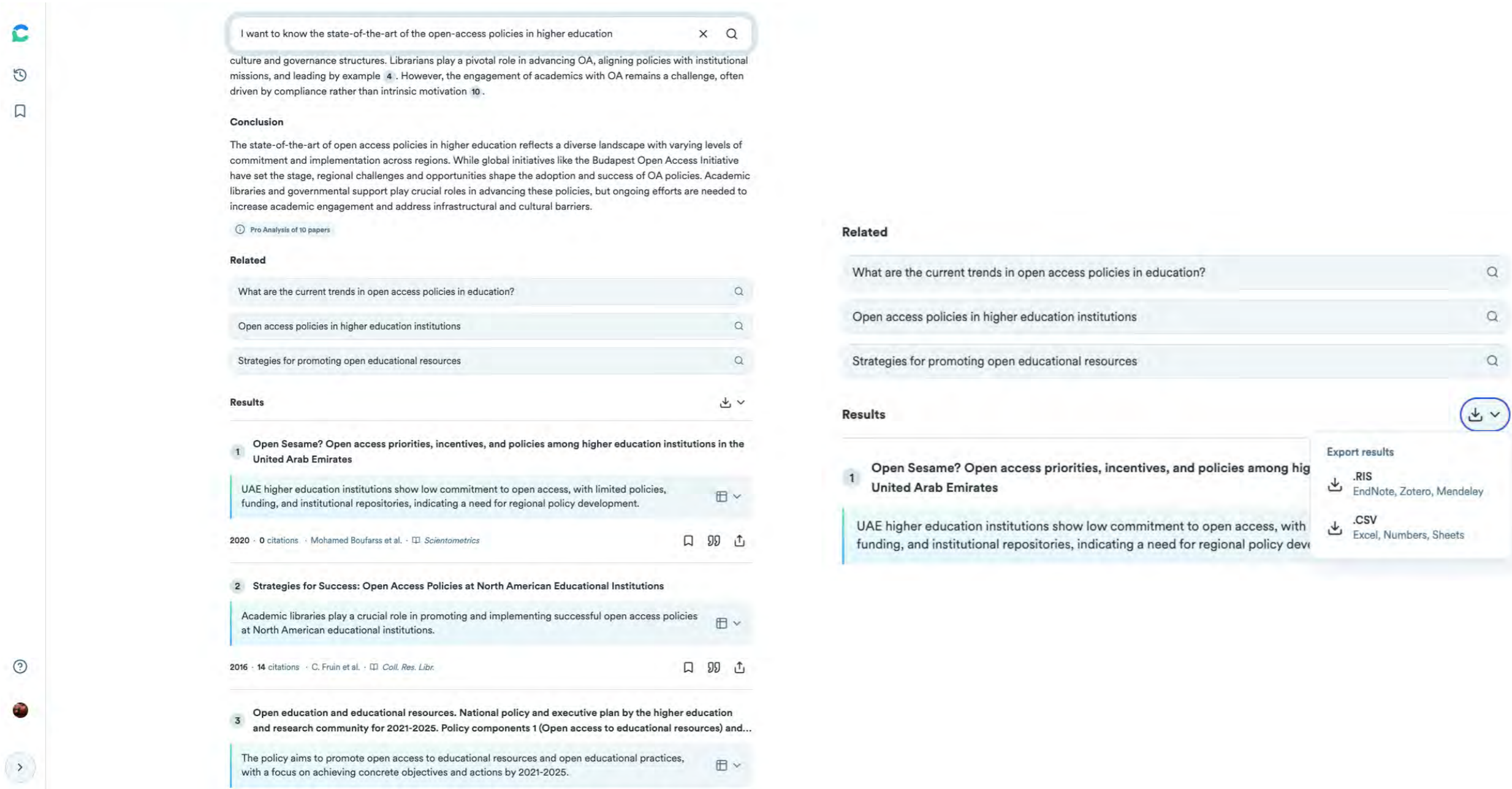
**United Kingdom**

In the UK, the introduction of policies by Research Councils UK (RCUK) and the Higher Education Funding Council for England (HEFCE) has necessitated new practices among HEIs. These include managing article processing charges and ensuring compliance with OA mandates, which have significantly influenced academic engagement with OA 9 10.

**Policy Components and Implementation**

Policies often include components such as open access to educational resources and open educational practices, which define objectives and actions for promoting openness in education 3. The focus on open access to theses and scholarly publications aims to enhance the impact and quality of research by making it more accessible to the broader community 5.

# Consensus – Exploring a research question



I want to know the state-of-the-art of the open-access policies in higher education

culture and governance structures. Librarians play a pivotal role in advancing OA, aligning policies with institutional missions, and leading by example 4. However, the engagement of academics with OA remains a challenge, often driven by compliance rather than intrinsic motivation 10.

**Conclusion**

The state-of-the-art of open access policies in higher education reflects a diverse landscape with varying levels of commitment and implementation across regions. While global initiatives like the Budapest Open Access Initiative have set the stage, regional challenges and opportunities shape the adoption and success of OA policies. Academic libraries and governmental support play crucial roles in advancing these policies, but ongoing efforts are needed to increase academic engagement and address infrastructural and cultural barriers.

Pro Analysis of 10 papers

**Related**

- What are the current trends in open access policies in education?
- Open access policies in higher education institutions
- Strategies for promoting open educational resources

**Results**

- Open Sesame? Open access priorities, incentives, and policies among higher education institutions in the United Arab Emirates**

UAE higher education institutions show low commitment to open access, with limited policies, funding, and institutional repositories, indicating a need for regional policy development.

2020 · 0 citations · Mohamed Boufarss et al. · *Scientometrics*
- Strategies for Success: Open Access Policies at North American Educational Institutions**

Academic libraries play a crucial role in promoting and implementing successful open access policies at North American educational institutions.

2016 · 14 citations · C. Fruin et al. · *Coll. Res. Libr.*
- Open education and educational resources. National policy and executive plan by the higher education and research community for 2021-2025. Policy components 1 (Open access to educational resources) and...**

The policy aims to promote open access to educational resources and open educational practices, with a focus on achieving concrete objectives and actions by 2021-2025.

**Related**

- What are the current trends in open access policies in education?
- Open access policies in higher education institutions
- Strategies for promoting open educational resources

**Results**

- Open Sesame? Open access priorities, incentives, and policies among high United Arab Emirates**

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Export results

  - .RIS (EndNote, Zotero, Mendeley)
  - .CSV (Excel, Numbers, Sheets)

# Consensus – Review a paper



← Paper Cite Save Share

## Open Sesame? Open access priorities, incentives, and policies among higher education institutions in the United Arab Emirates

Published Jun 8, 2020 · Mohamed Boufarss, Mikael Laakso

0 Citations 0 Influential Citations

Full text Semantic Scholar

Overview References Citations

### Abstract

Higher education institutions (HEIs) have an instrumental role in the move towards Open Access (OA) by shaping the national strategies, policies, and agendas. This study sets out to explore the role of HEIs in the United Arab Emirates (UAE) OA uptake and reflect on the ongoing international initiatives pushing for universal OA to research. The study is based on an online survey targeted at UAE higher education institutions research management units. In order to measure the institutional views, only one response was solicited from each institution. A total of 19 valid responses were received, making up 47% of HEIs included in the population of organisations. Our results suggest that there is low commitment to OA among UAE HEIs as attested by the low number of OA policies, scarce OA funding, limited proliferation of institutional repositories, perceived lack of urgency to migrate from current access models, and little consideration of OA for promotion purposes. The study is the first of its kind in the UAE, Arab and Middle Eastern countries, providing rare insight into a growing phenomenon that is global, yet most vocally discussed from a western perspective and context. The study contributes to the debate on the role of HEIs in the transition to OA and in shaping national and regional OA policies, as well as informing international initiatives about the current status of OA in the region.

### Study Snapshot

Key takeaway	UAE higher education institutions show low commitment to open access, with limited policies, funding, and institutional repositories, indicating a need for regional policy development.
Methods	Survey and data analysis
Outcomes	Institutional commitment to Open Access.
Results	Low commitment to Open Access among UAE higher education institutions.

Extracted 3/7 study attributes

← Paper Cite Save Share

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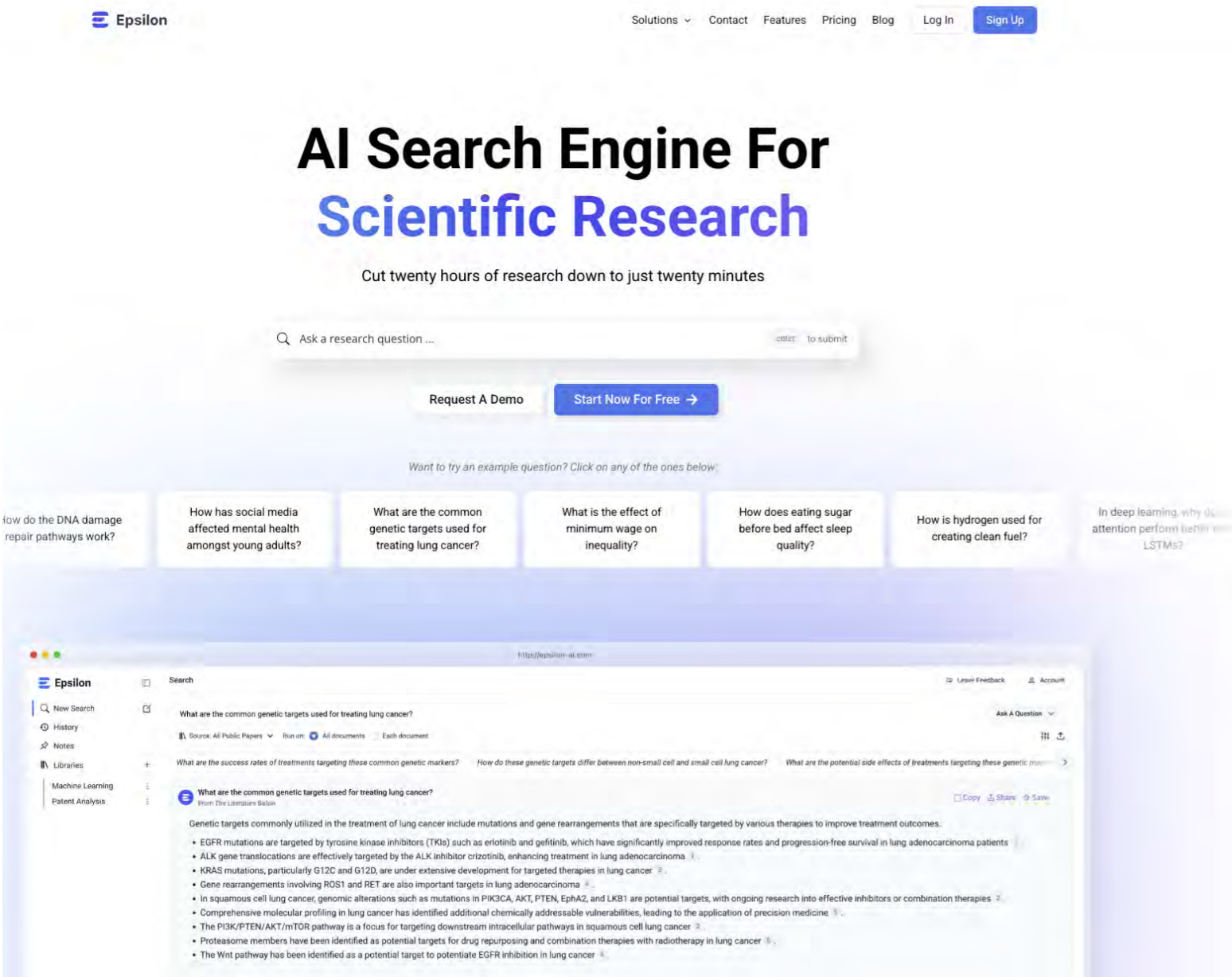
#### Cite this finding

APA MLA Chicago Harvard BibTeX

Boufarss, M., & Laakso, M. (2020). Open Sesame? Open access priorities, incentives, and policies among higher education institutions in the United Arab Emirates. *Scientometrics*, 124, 1553-1577. <https://doi.org/10.1007/s11192-020-03529-y>.

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# Epsilon



- Answer research questions by summarizing the passages that contain references to the sources
- Find research-related publications and patents.
- It allows you to create a library to organize research papers. Search your entire library to synthesize article results
- Search for key information in multiple articles and extract relevant information from each one
- Provides a complete summary of the introduction, results, and conclusion of uploaded documents

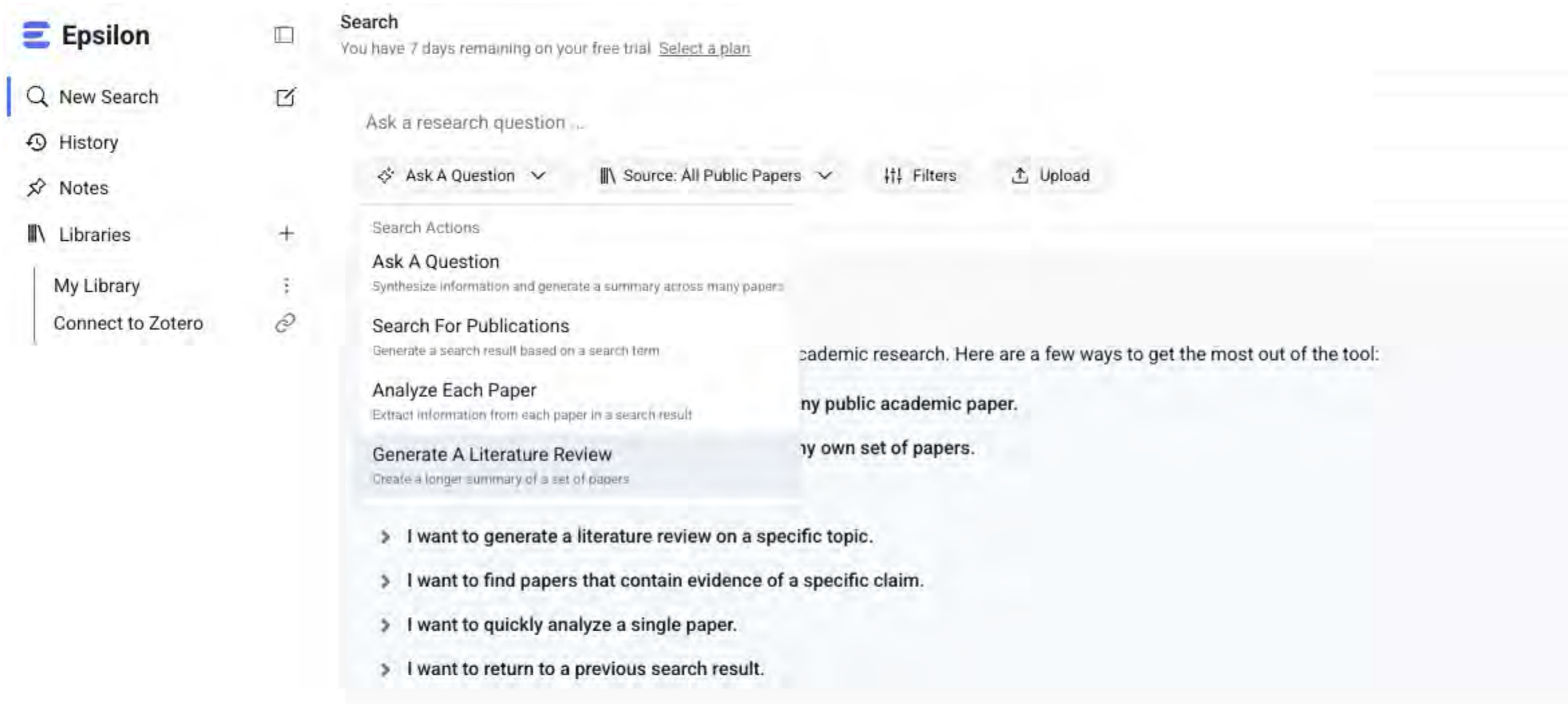
<https://www.epsilon-ai.com/>

# Epsilon – Home



The screenshot shows the Epsilon application interface. On the left is a navigation sidebar with the Epsilon logo and menu items: New Search, History, Notes, Libraries (with a sub-menu for My Library and Connect to Zotero), and a plus sign for more options. The main content area has a 'Search' header with a trial notice: 'You have 7 days remaining on your free trial. [Select a plan](#)'. Below this is a search input field with the placeholder 'Ask a research question ...'. A toolbar contains 'Ask A Question' (with a dropdown arrow), 'Source: All Public Papers' (with a dropdown arrow), 'Filters' (with a filter icon), and 'Upload' (with an upload icon). The main content area features a 'Welcome to Epsilon!' section with a blue header icon and a paragraph: 'Epsilon is a powerful tool to extract insights from academic research. Here are a few ways to get the most out of the tool:'. This is followed by a list of eight user goals, each preceded by a right-pointing chevron: 'I want to search for specific information from any public academic paper.', 'I want to search for specific information from my own set of papers.', 'I want to find relevant papers on a topic.', 'I want to generate a literature review on a specific topic.', 'I want to find papers that contain evidence of a specific claim.', 'I want to quickly analyze a single paper.', and 'I want to return to a previous search result.'

# Epsilon – Select “literature review”



**Epsilon**

- New Search
- History
- Notes
- Libraries
  - My Library
  - Connect to Zotero

**Search**  
You have 7 days remaining on your free trial [Select a plan](#)

Ask a research question ...

Ask A Question Source: All Public Papers Filters Upload

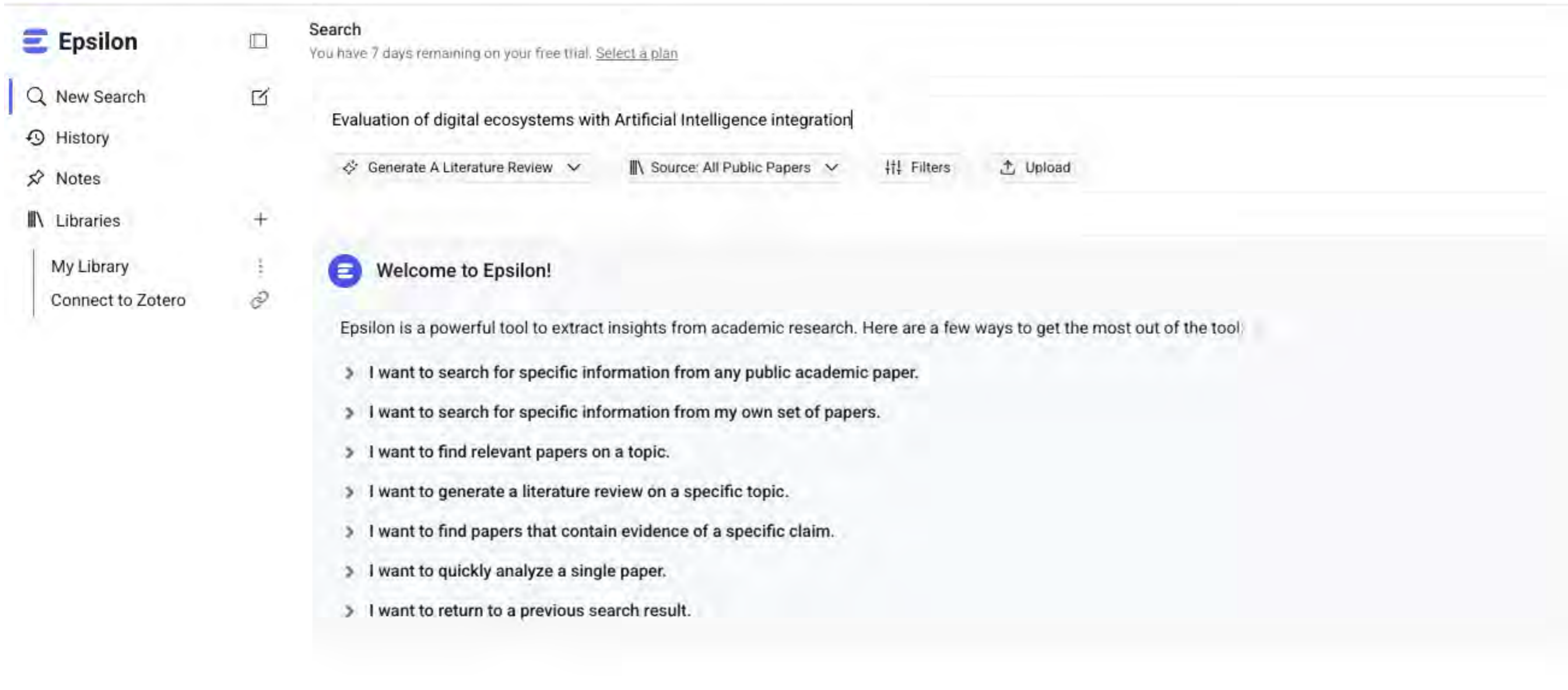
**Search Actions**

- Ask A Question**  
Synthesize information and generate a summary across many papers
- Search For Publications**  
Generate a search result based on a search term
- Analyze Each Paper**  
Extract information from each paper in a search result
- Generate A Literature Review**  
Create a longer summary of a set of papers

academic research. Here are a few ways to get the most out of the tool:

- I want to generate a literature review on a specific topic.
- I want to find papers that contain evidence of a specific claim.
- I want to quickly analyze a single paper.
- I want to return to a previous search result.

# Epsilon – Choosing a topic



The screenshot shows the Epsilon search interface. On the left is a navigation sidebar with the Epsilon logo and menu items: New Search, History, Notes, Libraries (with a sub-menu for My Library and Connect to Zotero), and a plus sign for additional options. The main search area has a search bar containing the text "Evaluation of digital ecosystems with Artificial Intelligence integration". Below the search bar are several controls: a "Generate A Literature Review" button with a dropdown arrow, a "Source: All Public Papers" dropdown menu, a "Filters" button with a list icon, and an "Upload" button with an upload icon. Below the search area is a "Welcome to Epsilon!" message with a list of seven use cases, each preceded by a right-pointing chevron (>).

**Epsilon**

**Search**  
You have 7 days remaining on your free trial. [Select a plan](#)

Evaluation of digital ecosystems with Artificial Intelligence integration

Generate A Literature Review Source: All Public Papers Filters Upload

**Welcome to Epsilon!**

Epsilon is a powerful tool to extract insights from academic research. Here are a few ways to get the most out of the tool:

- > I want to search for specific information from any public academic paper.
- > I want to search for specific information from my own set of papers.
- > I want to find relevant papers on a topic.
- > I want to generate a literature review on a specific topic.
- > I want to find papers that contain evidence of a specific claim.
- > I want to quickly analyze a single paper.
- > I want to return to a previous search result.

# Epsilon – Generation process



The screenshot displays the Epsilon search interface. On the left is a navigation sidebar with options like 'New Search', 'History', 'Notes', 'Libraries', 'My Library', and 'Connect to Zotero'. The main area shows a search for 'Evaluation of digital ecosystems with Artificial Intelligence integration'. Below the search bar, there are controls for 'Generate A Literature Review', 'Source: All Public Papers', 'Filters', and 'Upload'. The 'Generated Literature Review' section includes a 'Key Findings' paragraph and a 'Found Relevant Papers' section with a table of results.

**Generated Literature Review**  
Using the articles below

**Key Findings**  
Artificial Intelligence (AI) has significantly influenced various sectors by enhancing innovation, efficiency, and engagement. In the realm of digital innovation, AI has been identified as a crucial driver, improving organizational readiness, technological integration, and data quality, which are essential for digital transformation ( Harfizar, Wisnu et al., 2024 ). Similarly, AI's integration into marketing and consumer relations has transformed business practices, emphasizing the importance of algorithms in value creation and customer engagement ( Marrone, Testa et al., 2022 ).  
Moreover, the integration of AI with cybersecurity and technological ecosystems is pivotal for regional economic development, emphasizing the need for secure digital infrastructures and AI-driven solutions to optimize resource allocation and decision-making ( Abisoye, Akerele et al., 2022 ). In the educational sector, AI's integration affects teaching methodologies and student engagement, highlighting the need to understand its impact on pedagogical communication and the student experience ( Dzhanevizova, Nurselli et al., 2024 ).  
However, the adoption of AI also presents challenges, including ethical, methodological, and ownership concerns

**Found Relevant Papers**  
From the Literature (49)

Sort by: Relevance

TITLE	ACTIONS
<a href="#">A Practical Framework for Advancing Cybersecurity, Artificial Intelligence and Technological Ecosystems to Support Regional Economic Development and Innovation</a> 2022 · Ajayi Abisoye, Joshua Idowu Akerele	+ [icon] [icon] [icon]
<a href="#">The integration of artificial intelligence in cybersecurity measures for sustainable finance platforms: An analysis</a> 2024 · Ezekiel Onyekachukwu Udeh, Prisca Amajuoyi, Kudirat Bukola Adeusi · 37 Citations	+ [icon] [icon] [icon]
<a href="#">Examination of Artificial Intelligence Integration and Impact on Higher Education</a> 2024 · Hala Strohmier, Vincent Langer, Fardeen Mohamed · 1 Citations	+ [icon] [icon] [icon]

# Epsilon – Result: narrative syntex



The screenshot shows the Epsilon web interface. On the left is a navigation sidebar with options like "New Search", "History", "Notes", "Libraries", and "My Library". The main content area displays a search result titled "Evaluation of digital ecosystems with Artificial Intelligence integration". Below the title, there are controls for "Generate A Literature Review", "Source: All Public Papers", "Filters", and "Upload". The main text is a "Generated Literature Review" with sections for "Key Findings", "Latest Research", "Challenges, Open Questions, &amp; Opportunities", and "Methodologies". The "Key Findings" section discusses AI's impact on innovation, marketing, cybersecurity, education, and the environment. "Latest Research" covers AI in digital media, education, and cybersecurity. "Challenges, Open Questions, &amp; Opportunities" highlights ethical concerns and data ownership. "Methodologies" describes the use of SmartPLS and systematic literature reviews. The interface includes a top navigation bar with "Leave Feedback" and "Account" links, and a search bar at the top.

# Epsilon – Result: reference list

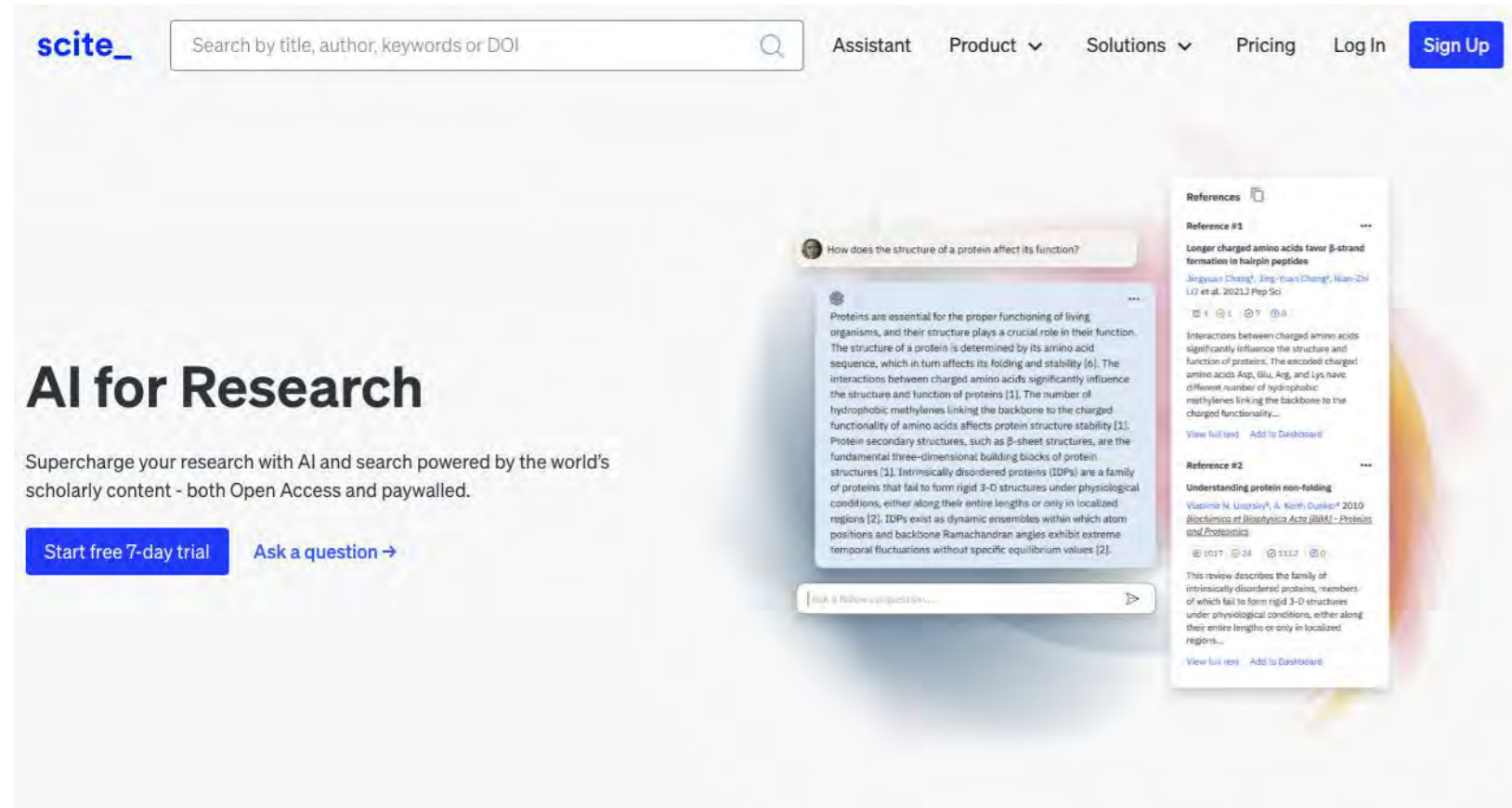


Found Relevant Papers  
From the Literature (49)

Sort by: Relevance

Most Relevant | Key Texts | Latest Research | All Papers

TITLE	ACTIONS
<a href="#">A Practical Framework for Advancing Cybersecurity, Artificial Intelligence and Technological Ecosystems to Support Regional Economic Development and Innovation</a> 2022 · Ajayi Abisoye, Joshua Idowu Akerele	+ [icon] [icon] [icon]
<a href="#">The integration of artificial intelligence in cybersecurity measures for sustainable finance platforms: An analysis</a> 2024 · Ezekiel Oyekachukwu Udeh, Pnsca Amaoyi, Kudirat Bukola Adeusi · 27 Citations	+ [icon] [icon] [icon]
<a href="#">Examination of Artificial Intelligence Integration and Impact on Higher Education</a> 2024 · Hala Strohmiet, Vincent Langner, Faiden Mohamed · 1 Citations	+ [icon] [icon] [icon]
<a href="#">Frameworks for procurement, integration, monitoring, and evaluation of artificial intelligence tools in clinical settings: A systematic review</a> 2024 · Sarim Dawar Khan, Z. Hoodbhoy, M. Raja · 2 Citations	+ [icon] [icon] [icon]
<a href="#">ARTIFICIAL INTELLIGENCE INTEGRATION ASSESSMENT IN BANKS THROUGH FINANCIAL REPORTING: CASE STUDY OF ARMENIA</a> 2024 · Henrik H. Manukyan, Suren H. Parsyan	+ [icon] [icon] [icon]
<a href="#">Utilizing digital story writing as a pedagogical approach to foster Artificial Intelligence (AI) literacy in students</a> 2024 · Dzul Rachman, Khusnul Khatimah, Taghfirul Azhima Yoga Siswa	+ [icon] [icon] [icon]
<a href="#">A Comprehensive Evaluation of Fake Face Recognition Scheme using Artificial Intelligence Oriented Learning Scheme</a> 2024 · S. Subashree, Remya Rose S, A. S. Valarmathy	+ [icon] [icon] [icon]
<a href="#">Analyzing the Influence of Artificial Intelligence on Digital Innovation: A SmartPLS Approach</a> 2024 · Harfizar, Muhammad Wisnu, Miftah Wicaksono · 35 Citations	+ [icon] [icon] [icon]
<a href="#">Evaluation Planning for Artificial Intelligence-based Industry 6.0 Metaverse Integration</a> 2023 · Janne Heilala, Khushboo Singh · 6 Citations	+ [icon] [icon] [icon]
<a href="#">The Reliability of Digital Evidence in Criminal Proceedings and the Potential Utilization of Artificial Intelligence in the Evidence Evaluation Process</a> 2024 · Cetin Arslan, Sefa Ata	+ [icon] [icon] [icon]
<a href="#">Artificial intelligence and big data-driven evaluation research and practices: A systematic literature review</a> 2024 · S. E. Bouyouafi, Miché Ouedraogo	+ [icon] [icon] [icon]
<a href="#">Influential factors of Artificial Intelligence (AI) in the digital transformation of the human resources recruitment process sector in Vietnam</a> 2024 · Bui Quoc Khoa, Nguyễn Văn Toai, Do Thi Thu Hien · 1 Citations	+ [icon] [icon] [icon]
<a href="#">Evaluation of artificial intelligence techniques in disease diagnosis and prediction</a> 2023 · Nafiseh Ghaffar Nis, E. Kaplanoglu, A. Nasab · 134 Citations	+ [icon] [icon] [icon]
<a href="#">Research on the Operation and Optimisation of Smart Power Plant System Based on Artificial Intelligence</a> 2024 · Xuhui Peng, Peng Luo, Zhengqiang Han	+ [icon] [icon] [icon]
<a href="#">Enhancing Artificial Intelligence and Machine Learning Understanding Through EnVision: A Virtual Reality Approach</a> 2024 · Louise Patra, Mansha Kurari, Radhakrishnan Gopalapilla	+ [icon] [icon] [icon]
<a href="#">Enhancing Security through Intelligent Threat Detection and Response: The Integration of Artificial Intelligence in Cyber-Physical Systems</a> 2024 · Muhammad Nur Abdül Latif Al Wazri	+ [icon] [icon] [icon]
<a href="#">A review of digital twins and their application in cybersecurity based on artificial intelligence</a> 2024 · Mohámmad-Hossein Hómaei, Oscar Mogollón-Gutierrez, José Carlos Sancho · 6 Citations	+ [icon] [icon] [icon]
<a href="#">Implications of Artificial Intelligence (AI) in Education: A Critical Review, Evaluation, and Conceptualization</a> 2024 · P. Christou	+ [icon] [icon] [icon]
<a href="#">Fusion of Augmented Reality and Artificial Intelligence A MOORA-Based Evaluation of AR Technologies</a> 2024	+ [icon] [icon] [icon]
<a href="#">Integration of Artificial Intelligence for educational excellence and innovation in higher education institutions</a> 2024 · A. Murden, Roshan Halikhorae · 4 Citations	+ [icon] [icon] [icon]



- Analyze citations not only for their quality, but also for their context
- Examine how articles are cited, sorting them into categories such as "supporting citation," "mention citation," and "dispute citation," allowing users to see not only how many times an article has been cited, but how it has influenced subsequent work
- It allows you to explore the literature not only through direct searches, but also by exploring the articles cited in a document
- It offers tools that help assess the quality and impact of research, such as the "Smart CitationBadge", which can be integrated into other platforms and highlight how an article has been cited directly in the text

<https://scite.ai/>

# Scite Assistant usage example

The screenshot displays the Scite Assistant interface. At the top, there are three main use cases:

- Ask simple questions and get reliable answers from the full-text of millions of research articles.**
  - "How does the structure of a protein affect its function?"
  - "What are the cognitive and neural mechanisms underlying decision-making and risk-taking behavior?"
  - "How many rats live in NYC?"
- Start a draft of an essay, grant, or paragraph.**
  - "Write an essay on how board composition of banks influences risk-taking"
  - "Write a grant proposing to explore how aneuploidy affects chromosome mis-segregation and list out three specific aims"
  - "Write a paragraph on how video games influence spatial reasoning"
- Effectively use information from research articles to support your research tasks.**
  - "Find competing evidence for the paragraph below"
  - "Summarize the following in two sentences with no references."
  - "Find a source for the following sentence:"

The main interface shows a search bar with the query "Give me five key references about chatgpt in education". Below the search bar, the assistant provides a response:

ChatGPT is a relatively new technology that has been gaining attention in the field of education. Here are five key references about ChatGPT in education:

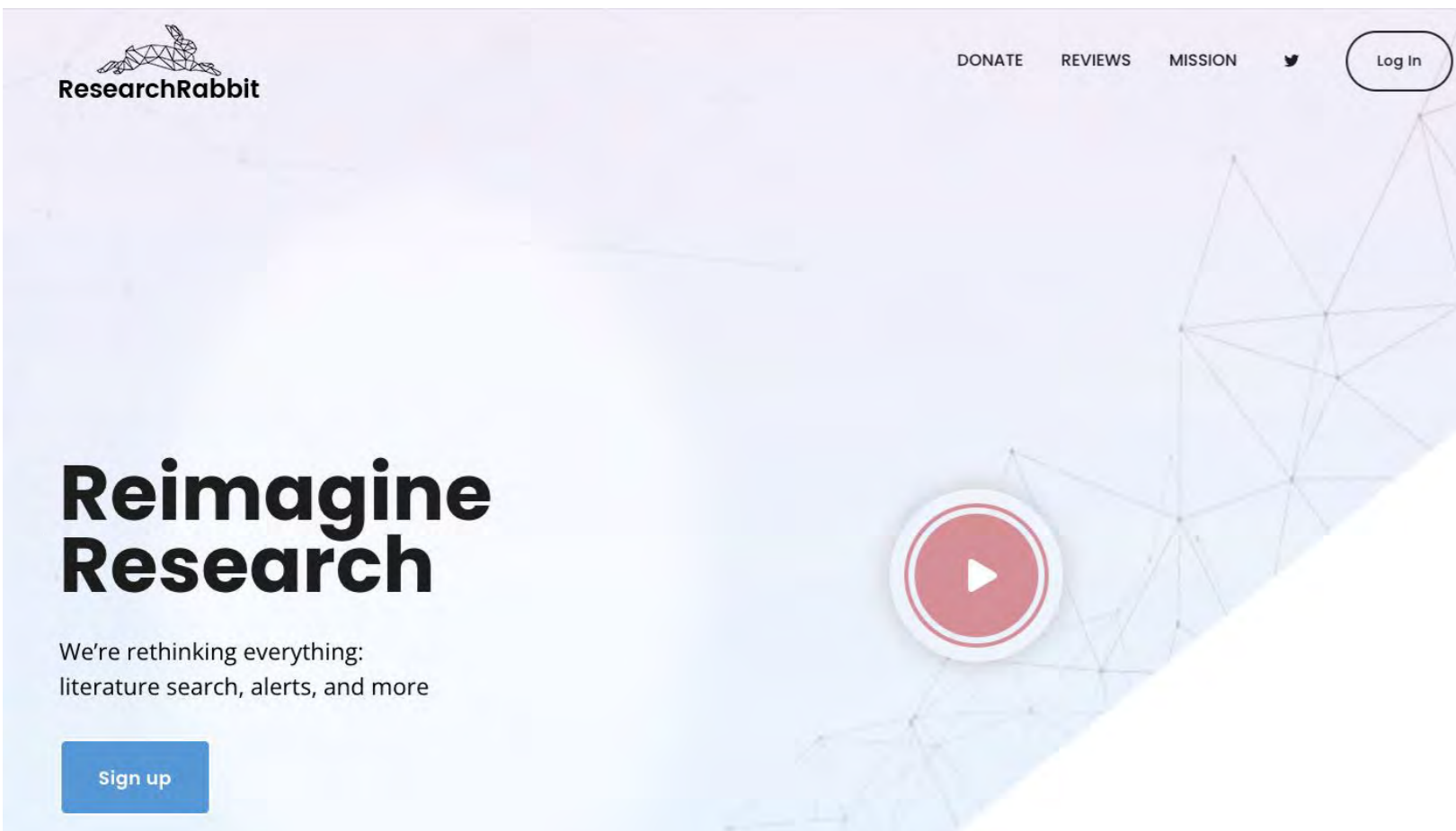
- Eguaras et al. (2021) conducted a study on teachers' attitudes towards chatbots in education. The study examined the factors that explain teachers' acceptance of chatbots through the dimensions of the Technology of Acceptance Model. The study found that the use of social language and proactiveness of the chatbot were important factors in teachers' acceptance of chatbots in education.
- Huh (2023) conducted a study to compare ChatGPT's knowledge and interpretation ability to those of medical students in Korea for taking a parasitology examination. The study found that ChatGPT's knowledge and interpretation ability for this parasitology examination were not yet comparable to those of medical students in Korea.
- Haristiani (2019) conducted a study on the use of AI chatbots as a language learning medium. The study found that chatbots offer an interactive way of learning, similar to the one-to-one interaction between a student and the educator.
- Tsivitanidou, Ioannou (2021) investigated the pedagogical uses of chatbots in higher education and the perceived benefits and challenges related to their use. The study found that chatbots have been applied in multiple educational contexts, such as health and well-being interventions, medical education, mathematics education, and language learning.
- Tili et al. (2023) conducted a qualitative instrumental case study on ChatGPT in education. The study examined ChatGPT among early adopters and found that it has drawn much public attention across the globe. The study concluded that the potential applications of ChatGPT in education are promising.

On the right side, there is a "References" panel showing the first reference in detail:

**Reference # 1**  
**Teachers' attitudes towards chatbots in education: a technology acceptance model approach considering the effect of social language, bot proactiveness, and users' characteristics**  
 Raquel Chocarro Eguaras<sup>1</sup>, Raquel Chocarro Eguaras<sup>2</sup>, Mónica Cortiñas Ugalde<sup>3</sup> et al. 2021 *Educational Studies*  
 37 | 3 | 20 | 0  
[View full text](#) [Add to dashboard](#) [Buy / Rent full text](#)  
 The appearance of Artificial Intelligence implementations, such as text-based virtual assistants (chatbots) in education is relatively new. These implementations can be useful for helping teachers and students to solve both educational questions and routine tasks. This paper examines the factors that explain teachers' acceptance of chatbots through the dimensions of the Technology of Acceptance Model (perceived usefulness and perceived ease of use), its conversational design (use of social language and proactiveness), and the teachers' age and digital skills. The data collection process included a pretest and an online survey with four different types of chatbots. We analyze 225 responses of primary and secondary education teachers. The results show that the perceived easiness and perceived usefulness leads to greater acceptance of chatbots. As for the chatbots' features, formal language by a chatbot leads to a higher intention of using them. These results can help in chatbot design and communication decisions, improving the acceptance of the educational community.

**Reference # 2**  
 "...In conclusion, ChatGPT's knowledge and interpretation ability for this parasitology examination were not yet comparable to those of medical students in Korea. Keywords: Artificial intelligence; Educational measurement; Knowledge; Medical students; Republic of Korea Background: Siobhan O'Connor [1] wrote an editorial, the opening paragraphs of which were written by ChatGPT, an artificial intelligence (AI) chatbot. ChatGPT was trained by a model using reinforcement learning from human feedback, using the same methods as InstructGPT (GPT: generative pre-trained transformer) [2]...."

# ResearchRabbit



- It allows you to organize bibliographic sources, facilitating the collection and management of articles, as well as extracting information and research data
- Dating network analysis, helping to identify trends, research gaps, and key connections between studies
- Generates visualizations of extracted data, such as concept maps or citation networks
- Integrates with multiple databases and information sources

<https://www.researchrabbit.ai/>

# Example of using ResearchRabbit from [1] as a seed

The screenshot displays the ResearchRabbit web application interface. On the left, there is a sidebar with navigation options like 'New Collection', 'New Category', and 'Connect to Zotero'. The main area shows a '1 selected paper' by Francisco José García-Peñalvo, titled 'Desarrollo de estados de la cuestión robustos: Revisiones Sistemáticas de Literatura'. Below this, a list of 'Similar Work' is visible, including papers like 'Retos y desafíos en la Educación Superior: una mirada desde la percepción de los docentes' and 'A participatory approach to ecosystem conservation: fuzzy cognitive maps and stakeholder group analysis in Ulubat Lake, Turkey'. On the right, a network graph shows connections between the selected collection and 50 papers, with nodes representing authors and their works, such as 'Moro 2021', 'García-Peñalvo 2021', and 'Mouratiadou 2007'. The interface also includes filters for 'Abstracts' and 'Comments', and options to 'Add Papers' or 'Export Papers'.

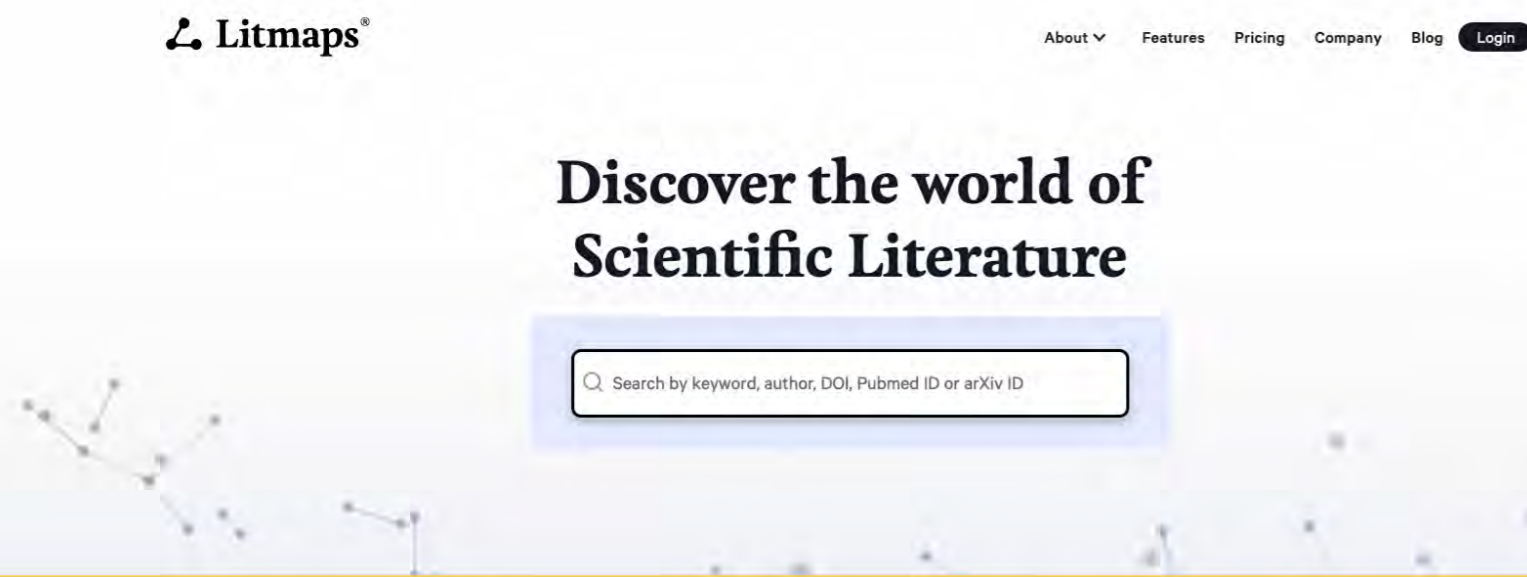
# Example of using ResearchRabbit from a Zotero collection as a seed

How to Conduct a Systematic Literature Review

The image displays the ResearchRabbit interface, which is used for discovering related research based on a seed collection. The interface is divided into several panels:

- Left Panel (Zotero Collection):** Shows a list of collections, including 'ChatGPT-Edu' with 31 items. A list of papers is displayed, with several items selected (indicated by blue checkmarks). The selected papers include:
  - Dental Education: A Review and Guide for Curriculum Update
  - How Does ChatGPT Perform on the United States Medical Licensing Examination? The Implications of Large Language Models for Medical Education and Knowledge Assessment
  - Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators
  - Examining Science Education in ChatGPT: An Exploratory Study of Generative Artificial Intelligence
  - Ethical use of artificial intelligence in health professions education: AMEE Guide No.158
  - Chatting or cheating? The impacts of ChatGPT and other artificial intelligence language models on nurse education
  - Chatting and cheating: Ensuring academic integrity in the era of ChatGPT
  - Academic Integrity considerations of AI Large Language Models in the post-pandemic era: ChatGPT and beyond
- Middle Panel (Selected Papers):** Shows 31 selected papers. It includes options to 'Remove from: ChatGPT-Edu', 'Add to Other Collection', and 'EXPLORE PAPERS' (Similar Work: 111, Earlier Work: 1, Later Work). It also features 'EXPLORE PEOPLE' (These Authors: 171, Suggested Authors: 23) and 'EXPLORE OTHER CONTENT' (Linked Content). 'EXPORT PAPERS' options include BibTeX, RIS, and CSV.
- Right Panel (Similar Work):** Displays a list of papers related to the selected ones, such as 'Exploring Generative Models with Middle School Students' and 'Teaching High School Students To Teach Machines'.
- Bottom Panel (Network Graph):** A network graph visualization showing connections between authors and papers. The central node is 'Ali 2021'. Other prominent nodes include 'Goodfellow 2014', 'Arora 2022', and 'Pataranutaporn 2022'. The graph shows a dense network of relationships between various authors and their works.

# Litmaps



- Allows you to discover academic scientific articles
- Generates visualizations of extracted data, such as concept maps or citation networks
- Facilitates collaboration with others
- Send notifications with new articles on a topic
- Integrates with multiple databases and information sources

<https://www.litmaps.com/>

# Litmaps



The screenshot shows the Litmaps web application interface. On the left, there is a sidebar with a search bar, 'IMPORT' and 'SYNC' buttons, and sections for 'Default Workspace', 'LITMAPS', and 'TAGS'. The main area features a large heading 'Find and understand research better' and a search input field with the placeholder text 'Search using keywords, titles, authors, or DOIs'. A 'Browse Learning Resources' link is located below the search field. In the foreground, a 'Create a Litmap' dialog box is open, containing the text: 'Litmaps are visual collections of articles that help you explore related articles and understand how research is connected.' Below this text is a search input field with the text 'Pruebal' and two buttons: 'Done' and 'Cancel'. The background of the main area is a blurred image of several Litmaps visualizations, which are network graphs showing connections between articles. Some visible nodes include 'Chee 1984', 'Wood 2002', 'Perkins 2016', 'Rhee 2017', 'Loew 1980', 'Soto 2010', 'Karpilus 2015', 'Jiang 2024', 'Chawla 2023', 'Chou 2023', 'Wang 2023', 'Collu 2022', 'Mylischer 2017', and 'Zhao 2014'.

# Litmaps



A screenshot of the Litmaps web application interface. The main window shows a sidebar on the left with navigation options like 'LITMAPS', 'Prueba', and 'TAGS'. The main content area displays 'No articles.' and a 'Find...' search bar. A modal dialog box titled 'Add Articles to Litmap' is open in the foreground. This dialog has a search bar containing the text '10.3390/su13042023'. Below the search bar are filter tabs: 'Most Relevant', 'Since 2025', 'Since 2024', 'Since 2021', and 'Custom'. On the left side of the dialog, there is a sidebar with 'Default Workspace', 'LITMAPS', 'Prueba', and 'TAGS'.

# Litmaps



The screenshot displays the Litmaps web application interface. On the left, a sidebar shows the workspace 'Prueba' and a search bar. The main area features a search bar with the input '10.3390/su13042023' and a search button. Below the search bar, there are filters for 'Most Relevant', 'Since 2025', 'Since 2024', 'Since 2021', and 'Custom'. A search result is shown in a card format, including the author 'García-Peñalvo, 2021', the article title, the keyword 'Sustainability', and citation counts: '82 REFERENCES' and '97 CITATIONS'. A blue 'Add to Litmap' button is visible. To the right, a detailed view of the article is shown, including the title, author, DOI (10.3390/su13042023), and the abstract text.

**Add Articles to Litmap**

Search: 10.3390/su13042023

Most Relevant | Since 2025 | Since 2024 | Since 2021 | Custom

García-Peñalvo, 2021

Avoiding the Dark Side of Digital Transformation in Teaching. An Institutional Reference Framework for eLearning in Higher Education

Sustainability

82 REFERENCES | 97 CITATIONS

Tag + Add to Litmap

**García-Peñalvo, 2021**

Avoiding the Dark Side of Digital Transformation in Teaching. An Institutional Reference Framework for eLearning in Higher Education

Sustainability

82 REFERENCES | 97 CITATIONS

Add to Litmap

Tag + Add to Litmap

**F. García-Peñalvo**

DOI: 10.3390/su13042023

The purpose of this paper is to define a reference framework for introducing eLearning practices in mainly face-to-face higher education institutions. We suggest a suitable adoption and management of associated infrastructures and processes, in order to guarantee the ethical use of data in the related academic and learning analytics. A theoretical framework is proposed after years of practice and experience in the institutional government of IT processes related to learning technology. The digital transformation of teaching should imply the right technological decisions made by people and for people, in order to achieve a more inclusive, participative, and human university supported by technology. digital transformation is a social requirement of governments, companies, and institutions, and it should take into account the associated risks of the unethical use of technology, which leads to the dark side of transformation processes. eLearning approaches, especially with the influence of the COVID-19 outbreaks, are increasing the need for digital mechanisms in universities. Further, there is a need for strategical support and reference models if we are to avoid these undesired effects.

# Litmaps



The screenshot displays the Litmaps web application interface. On the left, a sidebar shows the workspace name "Prueba" and a search bar. The main area is titled "Add Articles to Litmap" and features a search bar with the input "10.3390/su13042023". Below the search bar, there are tabs for "Most Relevant", "Since 2025", "Since 2024", "Since 2021", and "Custom". A search result is highlighted, showing the article title "Avoiding the Dark Side of Digital Transformation in Teaching. An Institutional Reference Framework for eLearning in Higher Education" by García-Peñalvo, 2021. The article has 82 references and 97 citations. A blue button labeled "Add to Litmap" is visible next to the article. The article's abstract is displayed below the title, starting with "The purpose of this paper is to define a reference framework for introducing eLearning practices in mainly face-to-face higher education institutions..."

# Litmaps



The screenshot shows the Litmaps web application interface. On the left, there is a sidebar with a search bar, 'IMPORT' and 'SYNC' buttons, and a workspace list containing 'Default Workspace', 'LITMAPS', 'Prueba', and 'TAGS'. The main area displays a search result for 'Prueba' with the article 'Avoiding the Dark Side of Digital Transformation in Teaching, An Institutional Reference Framework for eLearning in Higher Education Sustainability' by Garcia-Peñalvo, 2021. Below the article title, it shows '82 REFERENCES' and '97 CITATIONS'. A 'Tag' button is visible at the bottom of the article card. A modal dialog box titled 'Create a Tag' is open in the foreground, showing a list of tags: 'Digital transformation' (selected with an orange dot) and 'Z Sync with a Zotero Collection' (with a blue highlight). The dialog also includes 'Done' and 'Cancel' buttons.

# Litmaps



A screenshot of the Litmaps web application interface. The top left shows the 'Litmaps' logo and a search bar. Below the search bar are buttons for 'IMPORT' and 'SYNC'. A sidebar on the left shows a tree view with 'LITMAPS' and 'TAGS' sections. The 'LITMAPS' section is expanded to show 'Prueba'. The 'TAGS' section shows 'Digital transformation'. The main content area shows a search for 'Prueba' with a filter '10.3390/su13042023'. A message says 'Nothing matched your filters.' and there is a 'Reset Filters' button. A yellow tooltip points to the 'Explore Related Articles' button, stating 'Use Explore to find relevant research'. In the center of the main area, there is a large orange circle with the text 'García-Peñalvo, 2021' below it.

# Litmaps



The screenshot displays the Litmaps interface. On the left, a sidebar shows the workspace 'Prueba' with a search bar and filters for 'LITMAPS' and 'TAGS' (Digital transformation). The main area features a network visualization of articles, with a central orange node for 'García-Peñalvo, 2021' and several blue nodes for other authors and years. Lines represent citations between these nodes. A list of 'Explore Related Articles' is shown on the left, including articles by de Castro (2023), Ari (2022), Zaphiris (2017), Gorina (2023), and Gómez-Aguilar (2015). A yellow tooltip explains the visualization: 'Explore will recommend articles that are related to your Litmap. Use the visualization to see how they connect to your Litmap articles. Circles are articles added to the Litmap. Outlines are recommended articles. Lines are citations. Next: Recommendations Dismiss'. The interface also includes a 'Workspace Articles' section at the bottom left and a 'MORE CITATIONS' button on the right.

# Litmaps



**Litmaps** ● Digital transformation [Explore Related Articles](#) + Add Articles ⋮

Q Search... Find... Export All

IMPORT SYNC

Default Workspace

LITMAPS ↕ ⊕

Prueba

TAGS ↕ ⊕

- Digital transformation

Tags	Author	Year	Title	References	Citations
<span style="color: orange;">●</span>	García-Peñalvo	2021	Avoiding the Dark Side of Digital Transformation in Teaching. An Institutional Reference Framework for eLearning in Higher Education	82	97

# Litmaps



The screenshot displays the Litmaps web application interface. On the left, a sidebar contains navigation options like 'LITMAPS', 'Prueba', and 'Digital transformation'. The main area features a network visualization of research articles, with nodes representing authors and their works, connected by lines indicating citations. A central node is labeled 'García-Peñalvo, 2021'. Other nodes include 'García-Peñalvo, 2020', 'Kutnjak, 2019', 'Zhang, 2021', 'de Castro, 2021', 'Sein-Echaluze, 2022', 'de Castro, 2022', 'Montoya, 2019', 'Sloane-Seale, 2009', 'Kleinert, 2021', 'Peñalvo, 2014', and 'de Castro, 2023'. The interface also includes a search bar, filters, and a list of related articles on the left, such as 'Understanding Digital Learning Behaviors: Moderating Roles of Goal Setting Behavior and Social Pressure in Large-Scale Open Online Courses' and 'Formación en la sociedad del conocimiento, un programa de doctorado con una perspectiva interdisciplinar'. The bottom of the interface shows navigation controls and a 'MORE RECENTLY PUBLISHED' indicator.

# Litmaps



The screenshot shows the Litmaps web interface. On the left is a sidebar with the Litmaps logo, a search bar, and buttons for 'IMPORT' and 'SYNC'. Below these are workspace and tag lists. The main area is titled 'Import Articles' and includes a sub-header 'Quickly transfer your existing research into Litmaps.' and a 'Learn How' link. A large dashed box contains a blue button that says 'Choose file to upload, or drag+drop' and text below it stating 'Supported formats: BibTeX, RIS, Pubmed'. Below this box is a 'Manual bulk import' button. At the bottom, there is a 'Recently Imported' section with the text 'No recent imports'.

# Litmaps



The screenshot shows the Litmaps web interface. On the left is a sidebar with a search bar, 'IMPORT' and 'SYNC' buttons, a workspace selector set to 'Default Workspace', and a list of folders including 'LITMAPS', 'Prueba', and 'TAGS'. The main area is titled 'Import Articles' and contains a large dashed box with a blue button that says 'Choose file to upload, or drag+drop'. Below the button, it lists supported formats: BibTeX, RIS, and Pubmed. At the bottom, there is a 'Manual bulk import' button and a 'Recently Imported' section showing a file named 'ChatGPT-Educación.ris (31)' imported '3 minutes ago'. A 'Clear' button is located to the right of the 'Recently Imported' section.

# Litmaps



The screenshot shows the Litmaps interface. On the left, there's a sidebar with a search bar, 'IMPORT' and 'SYNC' buttons, a 'Default Workspace' dropdown, and a list of tags including 'LITMAPS', 'Prueba', 'Digital transformation', and 'TAGS'. The main area is titled 'Import Articles' and 'ChatGPT-Educación.ris', showing 'Results 31', 'Missing 0', and 'Duplicates 0'. A list of 31 selected articles is shown, each with a title, author, journal, and citation counts. The first article is 'What are GANs?: Introducing Generative Adversarial Networks to Middle School Students' by All, 2021, with 16 references and 23 citations. Below the list, a detailed view of this article is shown, including a blue 'Explore Related Articles' button, a 'Tag + Add to Litmap' button, and a list of authors: 'Safinah Ali', '+1...', and 'C. Breazzeal'. The article's DOI is 10.1609/aaai.v35i17.17821. The article text discusses the use of GANs in education and the development of a lesson module.

# Litmaps



**Litmaps** ChatGPT-Educación.ris

**Explore Related Articles**

Filter Date, Keyword, Journal, and more...

How are these results calculated? **Advanced**

- Tramallino, 2024**  
Avances y discusiones sobre el uso de inteligencia artificial (IA) en educación  
Educación/Educación  
46 REFERENCES 3 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- All, 2023**  
Constructing Dreams using Generative AI  
AAAI Conference on Artificial Intelligence  
28 REFERENCES 11 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Anderson, 2018**  
Teens, Social Media & Technology 2018  
0 REFERENCES 430 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Sanusi, 2023**  
Developing middle school students' understanding of machine learning in an African school  
Computers and Education: Artificial Intelligence  
64 REFERENCES 14 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Duipa, 2024**  
Generative AI: A systematic review using topic modelling techniques  
Data and Information Management  
114 REFERENCES 82 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Kim, 2018**  
Deep video portraits  
ACM Transactions on Graphics  
53 REFERENCES 703 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This

Workspace Articles  
Recent  
Support  
What's New  
fgarcia2006@gmail.c  
Free Account

Network graph showing nodes for authors and years: Cohen, 2017; Anderson, 2018; Kim, 2018; Anderson, 2018; Emmert-Streib, 2020; Ghosh, 2020; Ali, 2021; Oyedare, 2021; Wu, 2022; Gupta, 2024; Ali, 2023; Kho, 2021; Tang, 2022; Ali, 2023; Sanusi, 2023; Wang, 2023; Li, 2024; Tramallino, 2024; Cádiz, 2021; Shen, 2021; Marwal, 2024.

Recommendations Placement: Standard

**Litmaps** ChatGPT-Educación.ris

**Explore Related Articles**

Filter Date, Keyword, Journal, and more...

How are these results calculated? **Advanced**

- Williams, 2022**  
AI + Ethics Curricula for Middle School Youth: Lessons Learned from Three Project-Based Curricula  
International Journal of Artificial Intelligence in Education  
64 REFERENCES 82 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- All, 2021**  
Exploring Generative Models with Middle School Students  
International Conference on Human Factors in Computing Systems  
43 REFERENCES 36 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Touretzky, 2019**  
Envisioning AI for K-12: What Should Every Child Know about AI?  
AAAI Conference on Artificial Intelligence  
8 REFERENCES 414 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- All, 2019**  
Constructionism, Ethics, and Creativity: Developing Primary and Middle School Artificial Intelligence Education  
14 REFERENCES 100 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Jordan, 2021**  
PoseBlocks: A Toolkit for Creating (and Dancing) with AI  
AAAI Conference on Artificial Intelligence  
30 REFERENCES 40 CITATIONS  
Tag + Add to Litmap  
Refine Search: More Like This
- Sanusi, 2024**  
AI MyData: Fostering Middle School Students' Engagement with Machine Learning through an Ethics-Infused AI Curriculum  
1-10 of 100  
MORE RECENTLY PUBLISHED

Workspace Articles  
Recent  
Support  
What's New  
fgarcia2006@gmail.c  
Free Account  
Upgrade to Litmaps Pro

Network graph showing nodes for authors and years: Riley, 2016; Setiawan, 2021; Bogner, 2022; Anderson, 2018; Ali, 2021; Sanusi, 2023; Ali, 2023; Touretzky, 2019; Williams, 2022; Ali, 2019; Jordan, 2021; Sanusi, 2024; Ali, 2021.

Recommendations Placement: King

## In-depth investigation options (*deep research*)

- Intelligent agent approach that uses reasoning to synthesize large amounts of information online and completes multi-step research tasks autonomously [95]
- Available in ChatGPT Plus (<https://chatgpt.com>), in Perplexity (<https://www.perplexity.ai/>), in Gemini (<https://gemini.google.com/app>), in Grok (<https://grok.com/>)

# Deep research with ChatGPT

ChatGPT 4.5

Temporal



## ¿Qué estás investigando?

I need a report about the "Evaluation of digital ecosystems with Artificial Intelligence integration" including scientific sources, with a special focus on peer-reviewed journals and conference papers. The focus should be in the education domain, with a global perspective, and using an academic style. The technologies should be related to Generative Artificial Intelligence



Buscar

Investigación en profundidad



ChatGPT 4.5

Compartir



I need a report about the "Evaluation of digital ecosystems with Artificial Intelligence integration" including scientific sources, with a special focus on peer-reviewed journals and conference papers. The focus should be in the education domain, with a global perspective, and using an academic style. The technologies should be related to Generative Artificial Intelligence

I will prepare a comprehensive academic report on the evaluation of digital ecosystems with Artificial Intelligence (AI) integration, specifically focusing on Generative AI in the education domain. The report will draw from peer-reviewed journals and conference papers to ensure scientific rigor and a global perspective.

The content will cover the impact, challenges, and opportunities of Generative AI in educational digital ecosystems, addressing aspects such as personalized learning, accessibility, ethical considerations, and institutional integration.

I will notify you once the report is ready for review.

Iniciando la investigación



Pregunta lo que quieras



Buscar

Investigación en profundidad



# Deep research with ChatGPT

**ChatGPT 4.5**

**Request:** I need a report about the "Evaluation of digital ecosystems with Artificial Intelligence integration" including scientific sources, with a special focus on peer-reviewed journals and conference papers. The focus should be in the education domain, with a global perspective, and using an academic style. The technologies should be related to Generative Artificial Intelligence

**Response:** I will prepare a comprehensive academic report on the evaluation of digital ecosystems with Artificial Intelligence (AI) integration, specifically focusing on Generative AI in the education domain. The report will draw from peer-reviewed journals and conference papers to ensure scientific rigor and a global perspective. The content will cover the impact, challenges, and opportunities of Generative AI in educational digital ecosystems, addressing aspects such as personalized learning, accessibility, ethical considerations, and institutional integration. I will notify you once the report is ready for review.

**Activity Log:**

- Revisando artículos académicos (2 fuentes)
- Buscando ecosistemas digitales y educación en IA generativa
- Estoy revisando documentos sobre IA generativa en educación, como artículos de InvestigaciónGate, preprints y políticas sobre IA en la enseñanza superior.
- Leyó de [journal.aldinhe.ac.uk](http://journal.aldinhe.ac.uk)
- Estoy revisando la accesibilidad del enlace, sugiriendo buscar "Generative AI in higher education ALDinHE" para encontrarlo.
- Peregrinando nuevos caminos.
- Buscando inteligencia artificial generativa en educación superior
- Estoy revisando un PDF y menciones sobre IA generativa en educación, asegurando una

**Left Sidebar (Projects):** ChatGPT, Sora, Orientador Universitario, Wolfram, Explorar GPT, Macroll, Pensamiento económico, Economía de la UE, SECTOR PÚBLICO ESPA..., Derecho administrativo, Hoy, Digital Ecosystem AI Evaluation, 7 días anteriores, Paper Review Feedback, Bias in Fallacy Detection, AI Education Paper Review, Paper Review Summary, LLM Feedback in Education, Estado conservación La Rubia, Plano alturas edificios, Conducción impulso nervioso

**Bottom:** Pregunta lo que quieras. + Buscar Investigación en profundidad ... ChatGPT puede cometer errores. OpenAI no usa datos del área de trabajo de GRIAL para formar a sus modelos.

# Deep research with ChatGPT

ChatGPT 4.5

Compartir



I need a report about the "Evaluation of digital ecosystems with Artificial Intelligence integration" including scientific sources, with a special focus on peer-reviewed journals and conference papers. The focus should be in the education domain, with a global perspective, and using an academic style. The technologies should be related to Generative Artificial Intelligence

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The content will cover the impact, challenges, and opportunities of Generative AI in educational digital ecosystems, addressing aspects such as personalized learning, accessibility, ethical considerations, and institutional integration.

I will notify you once the report is ready for review.

Research completed in 9m 24 seconds

# Deep research with ChatGPT

## Evaluation of AI-Integrated Digital Learning Ecosystems: The Role of Generative AI

### 1. Introduction

Digital ecosystems in education refer to the interconnected network of digital tools, platforms, and stakeholders (students, teachers, content providers) that collectively support teaching and learning. In essence, *“a digital ecosystem is a systemically organized set of modern digital technologies to maintain the continuity of the educational process”* DEGRUYTER.COM. Such ecosystems encompass learning management systems, online content libraries, communication tools, and data analytics, all working in concert to create a seamless learning environment. Artificial Intelligence (AI) has become a key component of these ecosystems, with some definitions even characterizing educational cyberspace by the integration of internet networks, computer devices, and *artificial intelligence* DEGRUYTER.COM. The role of AI in transforming education is profound: AI can automate routine tasks, assist in lesson planning and assessment, provide real-time analytics, and personalize learning experiences MDPI.COM. These capabilities enable teachers to focus more on pedagogy and mentorship while students receive more tailored support.

In recent years, *generative AI* – AI systems capable of producing new content such as text, images, or even code – has emerged as a disruptive force in digital learning environments. The release of large language model-based tools like OpenAI’s ChatGPT in late 2022 introduced easily accessible generative AI into the educational landscape MDPI.COM. Generative AI can automatically produce human-like responses, essays, solutions, or creative content, which opens new possibilities for digital learning resources and tutoring. Schools and universities worldwide have been *“rapidly adjust[ing]”* to this technology WEFORUM.ORG, recognizing both its potential and the challenges it brings. In this context, evaluating AI-integrated digital ecosystems – especially those incorporating generative AI –

estoy pensando en marcos de evaluación multicriteria utilizando métodos como Delphi, para medir la calidad del contenido generado por IA en dimensiones como relevancia, pedagogía, soporte técnico y alineación curricular.

Leyó de mdpi.com

Estoy investigando cómo está transformando los entornos educativos digitales, desde un punto de vista positivo en el aprendizaje y el potencial para evaluar el progreso en tiempo real.

Leyó de ed.gov

Estoy pensando en cómo puede adaptar el contenido generativo a las necesidades de los estudiantes, generando problemas y respuestas en tiempo real.

Leyó de weforum.org

Estoy pensando en la inclusión de idiomas diversos y de género, promoviendo la equidad en el aprendizaje. Estoy pensando en técnicas de evaluación de la probabilidad en un modelo de herramientas de medición.

## Evaluation of AI-Integrated Digital Learning Ecosystems: The Role of Generative AI

### 1. Introduction

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mdpi.com

**Prompt: ChatGPT, Create My Course, Please!**

ChatGPT is an emerging technology that provides educational researchers with the ...

# Deep research with ChatGPT

ChatGPT 4.5

## 2. Literature Review

**AI in Education – Overview of Research:** Academic research on AI in education has grown substantially over the past two decades, with a marked acceleration in the late 2010s [\(DIGITALCOMMONS.USF.EDU\)](#). A systematic review of studies from 2000–2020 found that most research was concentrated in a few regions (notably the United States, Europe, and East Asia), highlighting the need for a more global perspective on AI-driven education [\(DIGITALCOMMONS.USF.EDU\)](#). Early AI in education efforts focused on intelligent tutoring systems, adaptive learning algorithms, and learning analytics. Common research themes have included automating aspects of teaching and assessment, modeling student cognition, predictive analytics for student performance, and integrating data-driven decision support in learning environments [\(DIGITALCOMMONS.USF.EDU\)](#). For example, researchers have explored machine learning models to predict student outcomes and tailor instruction, as well as knowledge-based systems to support personalized learning [\(DIGITALCOMMONS.USF.EDU\)](#). This body of work demonstrates that AI can serve various educational functions, from tutoring and grading to supporting administrative decisions. At the same time, literature surveys have pointed out that certain regions (such as Africa and parts of the developing world) are underrepresented in AI-in-education research, and they call for expanding the geographical and cultural scope of future studies [\(DIGITALCOMMONS.USF.EDU\)](#) to ensure truly global insights.

**Generative AI Applications in Learning Environments:** The advent of generative AI has sparked a new wave of education research starting around 2022-2023. Numerous studies and thought pieces examine how generative models like GPT-3/4 can be applied in classrooms and digital learning tools. Researchers have identified a range of potential applications: for instance, generative AI chatbots can engage in dialogue with students, answer questions, and provide tutoring in a conversational manner [\(MDPI.COM\)](#). Unlike earlier rule-based or narrow AI tutors, these models can produce flexible, contextually relevant explanations and examples on almost any topic, simulating a human tutor's responsiveness [\(MDPI.COM\)](#). Recent analyses show that ChatGPT and similar models are capable of generating coherent essay responses and even "expert solutions to complex tasks," as well as providing feedback on student-written texts [\(MDPI.COM\)](#). Such capabilities are being explored for automated writing evaluation, language practice, and on-demand problem solving in various subjects. Early classroom experiments are promising: for example, a study incorporating generative AI into a university English course (for non-native EFL learners in Korea) reported improved learning outcomes and student attitudes. Students who received AI-based writing and speaking practice showed higher gains in language proficiency and expressed greater motivation and confidence compared to those in traditional classes [\(EDTECH.MET\)](#). This suggests that generative AI can enhance engagement and effectiveness in learning when appropriately integrated. At the same time, comparative evaluations of different AI chatbots (e.g. ChatGPT vs. alternative models) are underway to determine their strengths, weaknesses, and best use cases in education [\(MDPI.COM\)](#). The rapid proliferation of such studies in 2023 indicates that generative AI's role in education is a frontier of considerable interest, with researchers examining everything from its technical capabilities to pedagogical implications.

ChatGPT 4.5

## 3. Methodologies for Evaluating AI-Integrated Digital Ecosystems

Evaluating the effectiveness and quality of AI-integrated digital education systems requires robust methodologies, combining traditional educational evaluation approaches with new techniques tailored to AI. **Common Assessment Frameworks:** Education researchers have long used multi-dimensional frameworks to assess digital learning environments. These frameworks typically consider several key dimensions, such as pedagogical effectiveness, content quality, technology usability, and learner outcomes. For instance, prior studies on digital learning resources suggest that evaluation criteria should include "content relevance, pedagogical effectiveness, technical support, and curriculum alignment" [\(MDPI.COM\)](#). In other words, a good educational digital ecosystem should deliver relevant content that aligns with learning objectives, employ sound pedagogy, function reliably on the technical side, and integrate with the curriculum and standards. Other scholars have expanded these criteria to include social and ethical dimensions (e.g. whether the system encourages collaboration or if it protects student data) [\(MDPI.COM\)](#). Traditional evaluation methods often involve gathering user feedback (from students and teachers), measuring learning gains (through tests or assignments), and observing engagement metrics within the digital platform. These provide a baseline for evaluating any educational intervention, AI-based or not.

**Frameworks for AI and Generative AI Evaluation:** Because AI-driven systems introduce unique considerations, researchers are developing specialized methodologies to evaluate them. A notable gap identified in the literature is the absence of comprehensive quality frameworks specifically for AI-generated educational content [\(MDPI.COM\)](#). While many works acknowledge that the quality of AI-generated materials (for example, an automatically created quiz or video) is multi-faceted, few had provided a systematic way to evaluate it. To address this, recent studies have proposed new evaluation frameworks. One approach combined expert consensus techniques (Delphi method) with analytic hierarchy process (AHP) to build an evaluation index for AI-generated digital educational resources [\(MDPI.COM\)](#). Through iterative expert surveys and quantitative weighting, this method yielded a set of key quality indicators grouped into four main dimensions: content quality, expression/presentation, user experience, and technical robustness [\(MDPI.COM\)](#). Such a framework attempts to quantify whether an AI-generated resource is pedagogically sound (accurate content, aligned with learning goals), clearly and engagingly presented, user-friendly and accessible, and technically reliable and secure. By establishing explicit indicators and metrics in each category, educators and administrators can more systematically evaluate AI-integrated learning tools. Another important evaluation strategy is continuous monitoring of AI systems in use. Rather than one-time evaluations, scholars recommend ongoing validation to ensure that as AI models update or as students interact in

# Deep research with ChatGPT

ChatGPT 4.5 ▾

## 4. Impact of Generative AI on Educational Digital Ecosystems

**Personalized Learning and Adaptive Education:** Generative AI has a strong potential to advance personalized learning within digital ecosystems. Adaptivity – the ability to adjust to individual learners – is regarded as a key benefit of AI in education [ED.GOV](#) . In practice, generative AI tutors (like advanced chatbots) can tailor their responses to each student’s needs. For example, if a student is struggling with a concept, an AI tutor can generate simpler explanations or additional examples on the fly; if a student is advanced, the AI can provide harder questions or delve deeper into the topic. This dynamic adjustment was historically challenging in one-size-fits-all classrooms, but AI makes it feasible on a large scale. Large language models such as ChatGPT can be used as personal tutors that respond to a student’s specific questions with detailed answers and can rephrase or expand on material until the student understands [MDPI.COM](#) . Such one-on-one, on-demand guidance exemplifies personalized learning. Moreover, generative AI can create custom learning materials – for instance, generating practice problems tailored to a student’s progress or writing prompts aligned with a student’s interests – which helps maintain engagement. By improving the “*adaptivity of edtech*,” AI ensures that each learner’s experience in the digital ecosystem is unique to their level and pace [ED.GOV](#) . Early evidence of this personalized impact is positive; studies have documented cases where students receiving AI-personalized support (e.g. AI-generated feedback on writing) showed greater improvement than those who did not [CEDTECH.NET](#) . Nonetheless, it’s important to continually assess that these personalized pathways are leading to the intended learning outcomes and not inadvertently narrowing exposure. Overall, generative AI stands as a promising tool for making digital learning more responsive and student-centered than ever before.

**Enhancing Accessibility and Inclusivity:** Another major impact of generative AI on educational ecosystems is the potential to broaden access and inclusion. A global perspective is critical here – educational AI should cater to learners of diverse languages, cultures, and abilities. UNESCO’s recent guidance on generative AI in education emphasizes inclusion as a top priority, urging that AI systems be designed to “*promote inclusion, equity, [and] linguistic and cultural diversity*” [WEFORUM.ORG](#) . Concretely, generative AI can help bridge language gaps by providing translation or tutoring in multiple languages. For example, a student in a remote area can interact with a generative AI in her native language to learn a subject that content is usually only available for in English – the AI can translate and even explain concepts in her local language. Ensuring multilingual support is one step towards leveling the playing field, and UNESCO specifically calls for GenAI systems to “*include data in multiple languages, especially minority ones.*” [WEFORUM.ORG](#) . Likewise, AI can be used to adapt materials for different learning needs: text-to-speech generation can assist learners with visual impairments or reading difficulties, and complex texts can be rephrased in simpler terms for those with lower literacy levels. If implemented thoughtfully, these capabilities make digital learning ecosystems more accessible to students who have historically been marginalized. However, true inclusivity also requires addressing biases. Generative AI models initially showed biases (e.g., gender

## 5. Future Directions and Recommendations

**Emerging Trends in Generative AI for Education:** Looking forward, research and practice in AI-integrated education are converging on several key trends. One trend is the pursuit of more **advanced AI techniques and models** tailored for education. Experts suggest exploring a wider range of AI approaches – beyond the currently dominant large language models – including techniques like Bayesian models or fuzzy logic systems, which could handle uncertainty and nuanced educational decisions better [DIGITALCOMMUNITIES.EDU](#) . We may see new generative AI architectures that are optimized for educational content generation (for example, models that can show step-by-step problem solutions or generate adaptive simulations). Another emerging area is **multimodal AI in education**, where generative AI might create not just text, but also other media like interactive diagrams, virtual labs, or personalized educational videos on demand. Such capabilities could greatly enrich digital ecosystems, creating immersive learning experiences. A related trend is the integration of generative AI with other emerging technologies: imagine AI-driven virtual reality tutoring, or generative agents in educational games that respond intelligently to student actions. These innovations are on the horizon and will require researchers to develop evaluation methods specific to these new formats. Crucially, future research is also emphasizing a more global and inclusive approach – expanding studies and pilot programs to underserved regions to ensure generative AI tools address a wide spectrum of educational contexts [DIGITALCOMMUNITIES.EDU](#) . This means working on AI that is culturally adaptive and available in many languages.

**Best Practices for Developing Digital Ecosystems:** As educational institutions implement and refine AI-rich digital ecosystems, certain best practices are becoming clear. One best practice is ensuring **interoperability and integration** of tools. Rather than isolated AI applications, schools should aim for a cohesive ecosystem where the AI seamlessly connects with existing learning management systems, content libraries, and data systems. There are examples of large-scale initiatives (such as statewide digital ecosystems) focusing on “*seamless integration of digital technologies and products into the educational process*” [DEBRUYTER.COM](#) . This interoperability makes it easier to adopt AI gradually and flexibly – for instance, plugging a new AI tutoring service into the LMS so that it can access assignment data and provide help within the same platform. It also prevents the fragmentation of the learning experience. Another best practice is adhering to **pedagogical principles** in technology deployment. No matter how novel the AI, its use should be guided by sound educational theory and evidence-based strategies. As one study put it, even in “*digital learning... the entire educational process must be based on inviolable didactic principles.*” [DEBRUYTER.COM](#) . This means involving educators in the design and selection of AI tools, aligning AI activities with curriculum standards, and



## 6. Conclusion

The integration of Artificial Intelligence into digital learning ecosystems is reshaping the landscape of education on a global scale. This report has reviewed how AI – and generative AI in particular – is redefining the possibilities of personalized, adaptive learning and expanding the reach of educational opportunities through multilingual and accessible tools. Empirical studies provide encouraging evidence that, when thoughtfully applied, generative AI can enhance student engagement, improve learning outcomes, and reduce burdens on teachers by automating routine tasks. At the same time, we have highlighted the critical challenges that accompany these opportunities: issues of bias, ethical use, academic integrity, and privacy cannot be overlooked. The success of AI-integrated education depends on careful evaluation and ongoing oversight to ensure these systems truly serve pedagogical goals and do not inadvertently harm or disadvantage learners.

Evaluating AI-integrated ecosystems requires a multifaceted approach, combining established educational evaluation criteria with new frameworks specific to AI-generated content and learning processes. As the technology evolves, educators and researchers must remain vigilant in assessing the quality, effectiveness, and fairness of AI tools. This includes developing comprehensive evaluation indices, engaging in continuous monitoring, and iteratively refining the integration of AI based on evidence.

Looking ahead, the future of digital ecosystems in education with AI is one of immense potential. Generative AI and related technologies will likely become standard components of the learning environment. To ensure this future is positive, stakeholders must collaborate across disciplines and borders. Investing in teacher training, student AI literacy, and robust policy frameworks will be essential so that educators are empowered to harness AI creatively and ethically. The global perspective is especially important – by sharing knowledge and setting international guidelines, we can address common challenges and make advanced educational AI accessible to all, not just a few. Ultimately, generative AI should be viewed not as a replacement for human teachers or a shortcut for students, but as a powerful tool that, under human guidance, can enrich the educational ecosystem. With a human-centered and evidence-based approach, the integration of generative AI can drive a new era of innovation in education, one that upholds the core values of equity, quality, and integrity in learning.

# Deep research with Gemini

I want to explore the Generative Artificial Intelligence risks from different perspectives (social, ethics, privacy, security, economics, technology, etc.), including scientific sources as peer-reviewed journals and international conferences

# Deep research with Gemini



Gemini

2.5 Flash

I want to explore the Generative Artificial Intelligence risks from different perspectives (social, ethics, privacy, security, economics, technology, etc.), including scientific sources as peer-reviewed journals and international conferences

# Deep research with Gemini

Gemini

2.5 Flash ▾



I want to explore the Generative Artificial Intelligence risks from different perspectives (social, ethics, privacy, security, economics, technology, etc.), including...

# Deep research with Gemini



Gemini  
2.5 Flash

I want to explore the Generative Artificial Intelligence risks from different perspectives (social, ethics, privacy, security, economics, technology, etc.), including...

✦ I've put together a research plan. If you need to update it in any way, let me know.

## Generative AI Risk Exploration

### Research Websites

- (1) Identify the major categories of risks associated with Generative AI, focusing on overviews from reputable academic or research institutions.
- (2) Investigate the social implications of Generative AI, such as misinformation, societal bias, and impact on human interaction, prioritizing findings from peer-reviewed journals and international conference proceedings.
- (3) Analyze the ethical considerations of Generative AI, including issues of accountability, fairness...

[Más](#)

### Analyze Results

### Create Report

🕒 Ready in a few mins

[Edit plan](#)

[Start research](#)

[Reintentar sin Deep Research](#)



# Deep research with Gemini



Gemini

2.5 Flash

Start research



Great. While I'm researching, feel free to leave this chat. I'll let you know as soon as I'm done.



Generative AI Risk Exploration

Buscando en 14 sitios web...

Generative AI Risk Exploration | Mostrar cuando piensa

## ★ Research Approach

*I'm starting my research into the risks associated with Generative AI, covering social, ethical, privacy, security, economic, and technological aspects. My plan is to first get a broad understanding of the major risk categories and then dive deeper into each specific area, prioritizing academic and scientific sources like peer-reviewed journals and conference proceedings.*

## Initial Information Gathering

*To begin, I'm focusing on identifying comprehensive overviews of Generative AI risks. I'll be looking for reports and publications from established academic institutions, research organizations, and policy bodies, using search terms like "Generative AI risks overview" and "AI ethics frameworks." My aim is to find broad categorizations of risks from reputable sources such as NIST, OECD, and the AI Now Institute.*

# Deep research with Gemini

Gemini  
2.5 Flash

Start research

Great. While I'm researching, feel free to leave this chat. I'll let you know as soon as I'm done.

**Generative AI Risk Exploration**  
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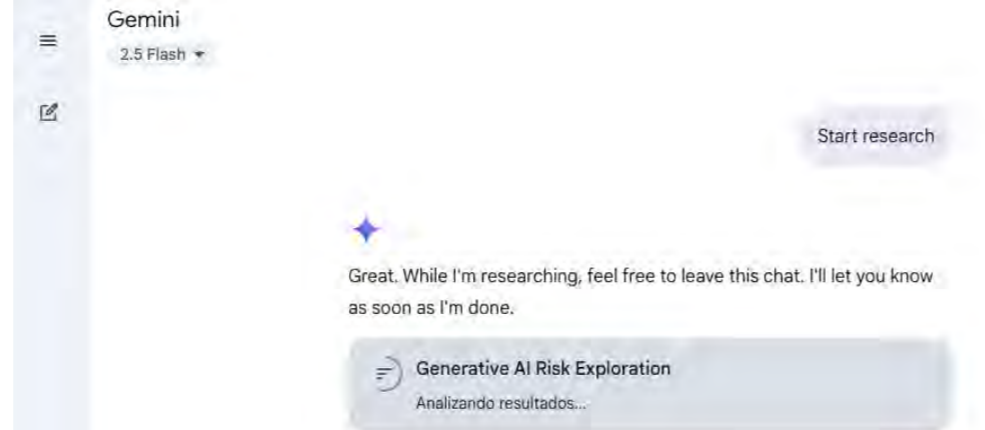
**Research Approach**  
*I'm starting my research into the risks associated with Generative AI, covering social, ethical, privacy, security, economic, and technological aspects. My plan is to first get a broad understanding of the major risk categories and then dive deeper into each specific area, prioritizing academic and scientific sources like peer-reviewed journals and conference proceedings.*

**Initial Information Gathering**  
*To begin, I'm focusing on identifying comprehensive overviews of Generative AI risks. I'll be looking for reports and publications from established academic institutions, research organizations, and policy bodies, using search terms like "Generative AI risks overview" and "AI ethics frameworks." My aim is to find broad categorizations of risks from reputable sources such as NIST, OECD, and the AI Now Institute.*

**Researching websites**

- partnershiponai.org Partn...
- ai.google.dev Responsible ...
- ibm.com AI Adoption Chall...
- libguides.reading.ac.uk Li...
- nist.gov U.S. Artificial Intel...
- cte.alliant.edu Concerns a...
- nist.gov Artificial Intelligen...
- ifaidata.foundation Respo...
- ainowinstitute.org ainowin...
- www2.deloitte.com How c...
- oecd.ai Generative AI: the ...
- oecd.org AI principles - O...
- wiz.io NIST AI Risk Manage...
- hyperproof.io NIST AI Risk ...

# Deep research with Gemini



# Deep research with Gemini

Gemini

2.5 Flash

Start research



Great. While I'm researching, feel free to leave this chat. I'll let you know as soon as I'm done.



**Generative AI Risk Exploration**

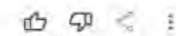
Creando tu informe...

Start research



I've completed your research. Feel free to ask me follow-up questions or request changes.

Generative AI Risk Exploration  
30 May, 10:17



# Deep research with Gemini

## Navigating the Landscape of Generative Artificial Intelligence Risks: A Multidimensional Analysis

### Executive Summary

Generative Artificial Intelligence (GAI) represents a transformative technological advancement, capable of creating novel content across various modalities. While offering immense potential for innovation and productivity, its rapid proliferation introduces a complex array of risks spanning social, ethical, privacy, security, economic, and technological dimensions. This report provides a comprehensive analysis of these multifaceted challenges, drawing upon peer-reviewed journals and international conference proceedings to offer an evidence-based understanding of the inherent dangers. The interconnected nature of these risks necessitates the urgent development and implementation of robust, multi-stakeholder mitigation strategies and adaptive governance frameworks to ensure GAI's responsible evolution and societal benefit.

### 1. Introduction: The Transformative Power and Inherent Risks of Generative AI

Generative Artificial Intelligence (GAI) refers to a sophisticated subset of AI technologies distinguished by their ability to produce original content, including text, images, audio, video, and software code, often in response to natural language prompts. Unlike traditional AI systems that primarily recognize patterns, GAI extrapolates from vast training datasets to synthesize entirely new outputs. This capability has catalyzed rapid adoption across numerous sectors, from content creation and services to critical domains like healthcare and finance. The widespread availability of GAI tools, notably ChatGPT, has marked a pivotal moment in AI history, intensifying discussions about its profound economic, social, legal, and ethical implications.

The inherent statistical nature of GAI models, which process information one element at a time, is a fundamental characteristic that gives rise to many of its associated risks. This statistical operation, while enabling generative power, can lead to the production of false or inaccurate information, a phenomenon commonly termed "hallucination". Such outputs are not merely errors but are emergent properties of how these systems fundamentally function, prioritizing statistical coherence over factual accuracy. This underlying mechanism also means that GAI outputs tend to reproduce and amplify biases present in their training data, making factual inaccuracy and bias amplification inherent consequences of the technology's design.

The rapid and widespread adoption of GAI tools is occurring at a pace that outstrips the development and implementation of adequate governance, regulatory frameworks, and societal understanding. This creates a significant "regulation gap," increasing the potential for unmanaged risks to manifest. Legal frameworks have struggled to keep pace with technological advancements, leading to a dynamic where risks emerge and impact real-world scenarios before policymakers or even developers fully comprehend or can effectively mitigate them. This temporal mismatch implies a continuous, reactive struggle to manage the negative externalities of GAI, rather than a proactive, preventative approach.

This report systematically explores the risks associated with Generative AI from various perspectives, including social, ethical, privacy, security, economic, and technological dimensions. It draws extensively on peer-reviewed journals and international conference proceedings to provide a scientifically rigorous and evidence-based analysis, aiming to illuminate the challenges and underscore the imperative for comprehensive risk management.

### 2. Social Risks: Shaping Perceptions and Human Interaction

Generative AI's capacity to produce highly realistic and human-like content profoundly influences societal dynamics, impacting information integrity, perpetuating biases, and reshaping fundamental aspects of human trust and interaction.

# Deep research with Gemini

Gemini  
2.5 Flash

Start research

I've completed your research. Feel free to ask me follow-up questions or request changes.

Generative AI Risk Exploration  
30 May, 10:17

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Generative AI Risk Exploration

Exportar Create X

housed within the Commerce Department as part of NIST, is tasked with identifying, measuring, and mitigating risks of advanced AI systems to accelerate trustworthy AI innovation. It focuses on developing testing, evaluations, and guidelines, including updated guidelines for managing misuse risk for dual-use foundation models. The US AISI Consortium brings together over 280 organizations to develop science-based standards for AI measurement and policy, focusing on secure development practices for GAI, privacy-preserving machine learning, and authenticating digital content.

Other significant initiatives include Google's Responsible Generative AI Toolkit, which provides tools and guidance for responsible application design, safety alignment, model evaluation, and safeguards like watermarking and content safety classifiers. The Responsible Generative AI Framework (RGAF) from LF AI & Data identifies nine dimensions relevant to responsible AI, aligning with major global frameworks such as the EU AI Act, NIST AI Framework, Singapore AI Strategy, and China's AI Development, aiming to help implementers and consumers navigate complex challenges. The NIST AI Risk Management Framework (AI RMF) provides a structured guide to identify, assess, and mitigate AI risks across the entire AI lifecycle, addressing bias, privacy violations, and security gaps, and is voluntary and adaptable for organizations. These frameworks emphasize principles like transparency, accountability, fairness, and security as cornerstones for trustworthy AI.

### 8.2. Challenges in Regulatory Harmonization

Despite the proliferation of global initiatives and frameworks, significant challenges remain in achieving regulatory harmonization for GAI. There are notable variations in how different global regions prioritize and enforce ethical principles like transparency, fairness, and privacy. For instance, the EU AI Act introduces comprehensive provisions with legal responsibility, while the United States often relies on voluntary compliance through frameworks like the NIST AI RMF. This fragmentation in ethical and regulatory approaches creates a complex landscape for international GAI development and deployment.

The lack of clear and harmonized legal frameworks concerning GAI and intellectual property also creates significant regulatory uncertainty, impacting the entire GAI industry. This uncertainty can deter investment and lead to unpredictable legal liabilities, potentially favoring larger, more resourced companies that can absorb legal costs, thereby leading to market concentration and stifling smaller innovators. The rapid advancement of GAI models and infrastructure further complicates regulatory efforts, as the dynamic nature of the technology means that static ethical frameworks quickly become obsolete. This necessitates an agile, iterative approach to governance that includes continuous monitoring and a willingness to revise guidelines based on emerging capabilities and real-world incidents.

Generative AI: the risks and the unknowns - OECD.AI  
oe.cd.ai/en/genai/issues/ns...

Generative AI: Privacy & Intellectual Property - Research...  
libguides.nps.edu/gen-ai/p...

Managing gen AI risks | Deloitte Insights  
www2.deloitte.com/us/en/i...

Blessing or curse? A survey on the Impact of Generative AI on Fake...  
arxiv.org/pdf/2404.030217

# Deep research with Gemini



The screenshot shows the Gemini AI interface. On the left, a sidebar indicates the model is Gemini 2.5 Flash. The main area shows a 'Start research' button and a message: 'I've completed your research. Feel free to ask me follow-up questions or request changes.' Below this is a search bar with the query 'Generative AI Risk Exploration' and a timestamp '30 may, 10:17'. On the right, a detailed report titled 'Generative AI Risk Exploration' is displayed. The report text states: 'Addressing these multifaceted challenges requires a comprehensive and collaborative approach. This includes the continuous development of science-based guidelines and standards by organizations like NIST, the implementation of responsible AI toolkits by industry, and the fostering of ethical frameworks that prioritize transparency, accountability, and fairness. Crucially, given the dynamic nature of GAI, regulatory efforts must be agile and forward-looking, anticipating future risks rather than merely reacting to existing threats. Beyond technical safeguards, cultivating a strong ethical culture and promoting AI literacy across society are essential to ensure responsible human interaction with these powerful systems. Only through such integrated and proactive strategies can the risks of Generative AI be effectively managed, ensuring its development and deployment align with human values and contribute positively to global progress.' Below the text is a section titled 'Fuentes usadas en el informe' (Sources used in the report) which lists 25 references from various sources including IBM, Alliant, AINOW, OECD, Hyperproof, Wiz, Libguides, NIST, Google, Deloitte, Ifaidata, Academic.oup, Tmb.apaopen, Researchgate, Arxiv, AAUP, Scielo, Oracle, Widener, Publicintegrity, and HBS.

# Deep research with Gemini

Fuentes consultadas, pero no usadas en el informe ^


 [partnershiponai.org](https://partnershiponai.org) Partnership on AI Launches New Initiative to Guide Enterprise Organizations in Responsible AI Adoption

 [arxiv.org](https://arxiv.org) On the Challenges and Opportunities in Generative AI - arXiv

[aaai.org](https://aaai.org) AAAI-25 New Faculty Highlights Program

 [pmc.ncbi.nlm.nih.gov](https://pmc.ncbi.nlm.nih.gov) Explainable AI: A Review of Machine Learning Interpretability Methods - PMC

 [ox.ac.uk](https://ox.ac.uk) Expert Comment: How is generative AI transforming the labour market? | University of Oxford

 [cybersecurity.umbc.edu](https://cybersecurity.umbc.edu) Talk: Unveiling Privacy Risks in AI: Data, Models, and Systems – Cybersecurity News

 [youtube.com](https://youtube.com) USENIX Security '24 - Prompt Stealing Attacks Against Text-to-Image Generation Models

 [youtube.com](https://youtube.com) How Different Groups Prioritize Ethical Values for Responsible AI – YouTube

 [computer.org](https://computer.org) Ethical Considerations and Implications of Generative AI in Computer Graphics

# Best practices for the use of AI in literature reviews

- If AI tools have helped in the review process, a mention of these tools and the process followed should be included in the methodology section [96]
- You can start from generalist tools or Large Language Models (LLMs) [97], such as ChatGPT (<https://chatgpt.com>) [98], to begin to understand a topic, but it is recommended that you then locate the articles in other tools more oriented to work with articles, such as Consensus or SCISpace
  - Although LLMs show promise in supporting the creation of literature reviews, fully established or validated applications are often lacking. The rapid increase in research on LLMs to produce evidence syntheses highlights their growing relevance [99]
- In the initial understanding of a topic or research question, it can help to create a mind map, for example, by generating it with ChatGPT [96]
- Elicit is a great tool for identifying and designing research questions
- For narrative syntheses, Epsilon (extensive and very well structured), Consensus, SCISpace, or Elicit are recommended. The "deep research" capability of ChatGPT or Perplexity can be explored
- To obtain a summary or ask questions about a specific article for which you have the full text, ChatGPT or SCISpace is recommended

# Best practices for the use of AI in literature reviews

- Generative AI in academic papers can be seen as an enabler of processes, but it must be applied with critical thinking [100]
  - **Review:** Accept nothing without asking: Is this compatible with the bulk of the best available evidence?
  - **Logic:** Apply logic. It implies having informal and formal logic skills
  - **Verification:** Verify the consistency and compatibility of new ideas or new data with the bulk of prior knowledge or the best available prior evidence

# Principles for the responsible use of generative AI in research [101]



- **Reliability** when it comes to guaranteeing the quality of research, reflected in the design, methodology, analysis, and use of resources. It includes aspects related to verifying and reproducing AI-generated information for research. It also involves being aware of potential equality and non-discrimination issues in relation to bias and inaccuracies
- **Honesty** when it comes to developing, conducting, reviewing, reporting, and communicating about research in a transparent, fair, thorough, and impartial manner. This principle includes revealing that generative AI has been used

# Principles for the responsible use of generative AI in research [101]



- **Respect** by colleagues, research participants, research subjects, society, ecosystems, cultural heritage, and the environment. The responsible use of generative AI must consider the technology's limitations, its environmental impact, and its social effects (bias, diversity, non-discrimination, equity, and harm prevention). This includes the proper management of information, respect for privacy, confidentiality, and intellectual property rights, as well as the correct citation

# Principles for the responsible use of generative AI in research [101]



- **Accountability** for research from idea to publication, for its management and organization, for training, supervision and mentoring, and for its wider social impact. This includes responsibility for all the results a researcher produces, underpinned by the notion of human agency and oversight

# Recommendations for researchers [101]

1. To be ultimately responsible for scientific production
2. Using generative AI transparently
3. Pay particular attention to issues related to privacy, confidentiality and intellectual property rights when sharing sensitive or protected information with AI tools
4. When using generative AI, respect applicable national, EU and international legislation, just as in your regular research activities
5. Continuously train on the correct use of generative AI tools to maximize their benefits
6. Refrain from using generative AI tools substantially in sensitive activities that may affect other researchers or organizations (e.g., peer review, evaluation of research proposals, etc.).

# Recognition of the use of generative AI must be provided and requested



- It is important to promote the use of these technologies in a responsible and ethical way
- At a minimum, a statement of use should be included explaining which technologies have been used to generate scholarly material
  - Recognize the use of generative AI
  - Specify which technology has been used
  - Include explicit descriptions of how the information was generated
  - Identify the instructions used
  - Explain how the result was used in the work

<https://d66z.short.gy/pMn84w>

# Recognition of the use of generative AI must be provided and requested



I acknowledge the use of [insert AI system(s) and link] to [specific use of generative artificial intelligence]. The prompts used include [list of prompts]. The output from these prompts was used to [explain use].

## **EXAMPLE 1**

EXAMPLE 2

EXAMPLE 3

EXAMPLE 4

I acknowledge the use of [1] ChatGPT (<https://chat.openai.com/>) to [2] generate materials for background research and self-study in the drafting of this assessment. I entered the following prompts on 4 January 2023:

- [3] Write a 50 word summary about the formation of Monash University. Write it in an academic style. Add references and quotations from Sir John Monash.

[4] The output from the generative artificial intelligence was adapted and modified for the final response.

**Legend:** [1] AI system(s) and link; [2] specific use of generative AI; [3] prompt; [4] explanation of use.

I acknowledge the use of [insert AI system(s) and link] to [specific use of generative artificial intelligence]. The prompts used include [list of prompts]. The output from these prompts was used to [explain use].

EXAMPLE 1

## **EXAMPLE 2**

EXAMPLE 3

EXAMPLE 4

I acknowledge the use of [1] ChatGPT (<https://chat.openai.com/>) to [2] generate materials that were [4] included within my final assessment in modified form. I entered the following prompts on 4 January 2023:

- [3] Write a 50 word summary about the formation of Monash University. Write it in an academic style. Add references and quotations from Sir John Monash.

**Legend:** [1] AI system(s) and link; [2] specific use of generative AI; [3] prompt; [4] explanation of use.

<https://d66z.short.gy/pMn84w>

# Recognition of the use of generative AI must be provided and requested



I acknowledge the use of [insert AI system(s) and link] to [specific use of generative artificial intelligence]. The prompts used include [list of prompts]. The output from these prompts was used to [explain use].

EXAMPLE 1    EXAMPLE 2    **EXAMPLE 3**    EXAMPLE 4

I acknowledge the use of [1] ChatGPT (<https://chat.openai.com/>) [2] to refine the academic language and accuracy of my own work. On 4 January 2023 I submitted my entire essay ([link to google document here](#)) with the instruction to [3] "Improve the academic tone and accuracy of language, including grammatical structures, punctuation and vocabulary". [4] The output ([here](#)) was then modified further to better represent my own tone and style of writing.

**Legend:** [1] AI system(s) and link; [2] specific use of generative AI; [3] prompt; [4] explanation of use.

I acknowledge the use of [insert AI system(s) and link] to [specific use of generative artificial intelligence]. The prompts used include [list of prompts]. The output from these prompts was used to [explain use].

EXAMPLE 1    EXAMPLE 2    EXAMPLE 3    **EXAMPLE 4**

If AI was **permitted** to be used in your assessment, but you have chosen *not* to use it, the following disclosure is recommended.

No content generated by AI technologies has been used in this assessment.

<https://d66z.short.gy/pMn84w>

A long, straight road stretches into the distance, flanked by water. The road has a double yellow line down the center. In the far distance, a person is walking away from the camera. The sky is overcast and grey.

## 10. Conclusions

# Conclusions

- Systematic reviews of the literature offer the possibility of being informed about an area of interest
- Writing a review of flawed literature is one of the many ways to make a publication fail [102]
- If the literature review is poor, the rest of the research can also be seen as imperfect, because "a researcher cannot conduct meaningful research without first knowing the literature in the field of study" [103]

# Conclusions

- The review of the state of the art is a basic activity for both new and more established researchers
- The management of the time and resources necessary to provide good coverage of the state of the art has evolved from the days when reference sources were in traditional libraries or in researchers' offices, and an opportunity-based approach was developed, to mass access to primary sources in digital libraries, where the problem is no longer access, but the information overload that requires applying systematic methods to be able to discern between the works that really contribute to the state of the art, from those that simply introduce noise [1]

# Conclusions

- When doing a systematic review, a systematic protocol must be used to facilitate the process and traceability.
- It should be supported by tools that allow the initial dataset and filtered versions to be shared until the selected dataset is reached
  - Spreadsheets, websites, tools (e.g., Parsifal <https://parsif.al/>)
- There is a proliferation of tools that support the document review process, facilitate its management, enable searching for related articles, and offer utilities for analysis and synthesis... Integrating the tools into a workflow will be a great help for literature review studies

# Conclusions

- The proliferation of generative AI-based tools constitutes a significant advance in research, particularly in the development of literature review workflows, but their use must be conditioned by ethics, transparency, traceability, and critical thinking. That is, the recommendations of the European Union and the manifesto for safe AI in education [104, 105] should be considered

# Conclusions

- Strengths of a systematic review
  - These types of reviews are considered the strongest reviews in many areas of knowledge
  - Many organizations fund systematic review processes to develop research
  - A good systematic review has options to be published in the format of a scientific article
  - They allow the creation of robust state-of-the-art solutions on which to base research or academic work, especially in a PhD thesis
  - In PhD theses, systematic literature reviews represent evidence that researchers can analyze and interpret related and already published academic works critically

# Conclusions

- Weaknesses of a systematic review
  - Primary source bias
  - If the review takes too long, some parts of the process will need to be redone after a while
  - It should generally be extended to databases other than the main ones to improve the effectiveness of the systematic review
  - On many occasions, a systematic literature review that is submitted as a scientific article is not understood by the reviewers

# Conclusions

- To publish a systematic review paper as a scientific article
  - Find which journals/conferences usually publish them, as well as the latest review articles published in these sources
  - Prepare the article version based on the latest articles previously published in the selected journal/conference
  - If you have a very large review paper, only a portion of it should go in an article. The other part of the content/results could be the subject of another article or be available in the memory of the academic work
  - Provide links to datasets available in the cloud



*Thank you*



# References

# History



- This material is based on editions of the following seminars

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# How to Conduct a Systematic Literature Review?

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