

How to Conduct a Systematic Literature Review?

Francisco José García-Peñalvo

Grupo GRIAL

Dpto. Informática y Automática

Instituto Universitario de Ciencias de la Educación (<https://ror.org/00xnj6419>)

Universidad de Salamanca (<https://ror.org/02f40zc51>), Salamanca, España

fgarcia@usal.es

<https://orcid.org/0000-0001-9987-5584>

<http://grial.usal.es>

<https://twitter.com/frangp>

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POLITÉCNICA



Available at: <https://d66z.short.gy/rf0A0Y>

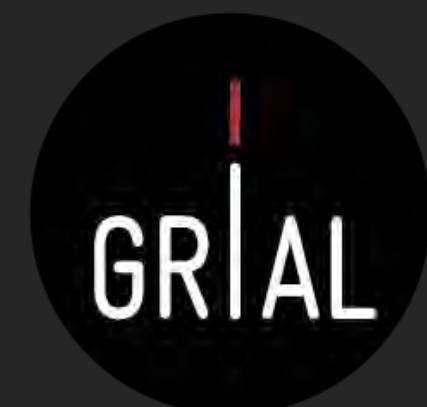


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Recommended article

- 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



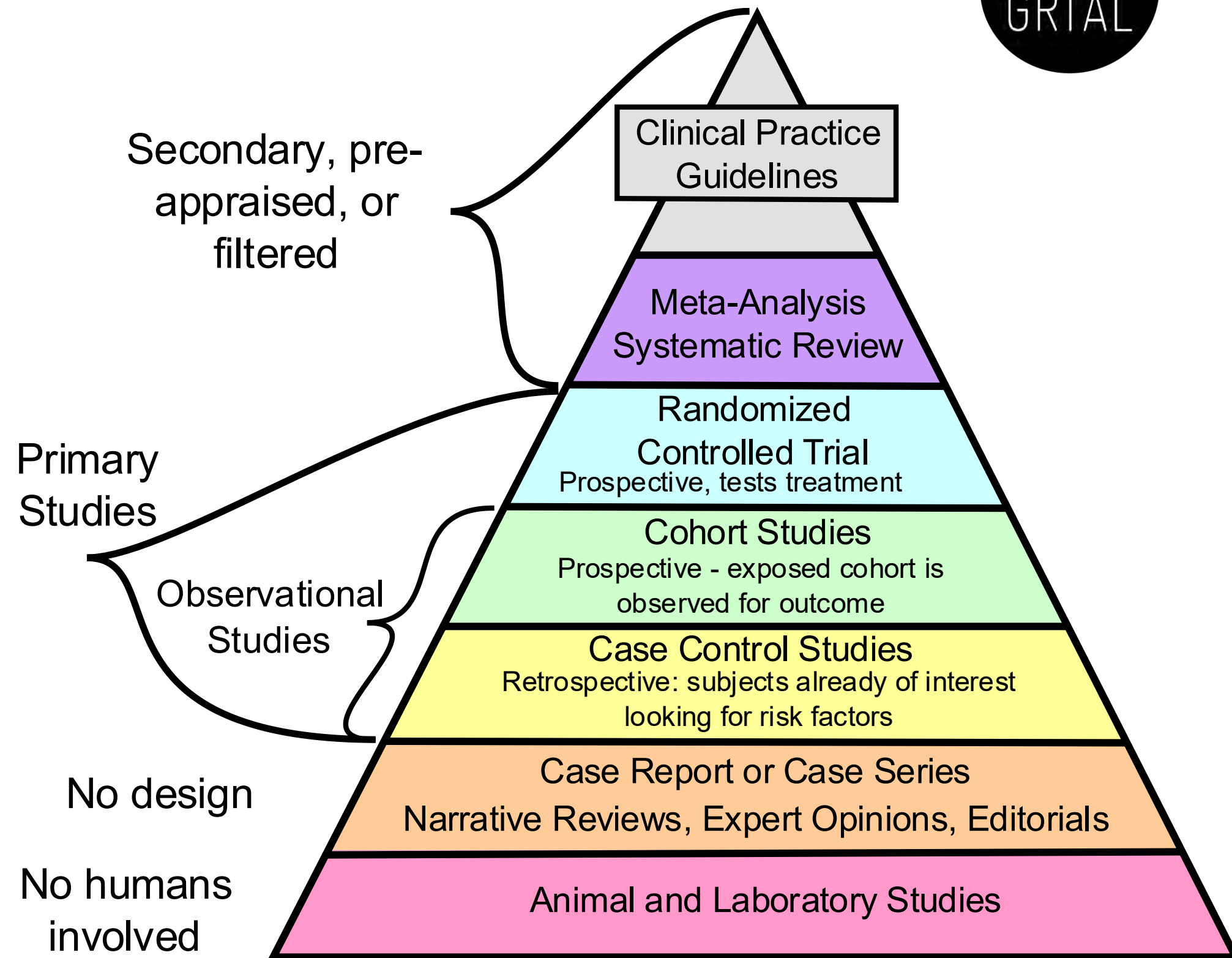
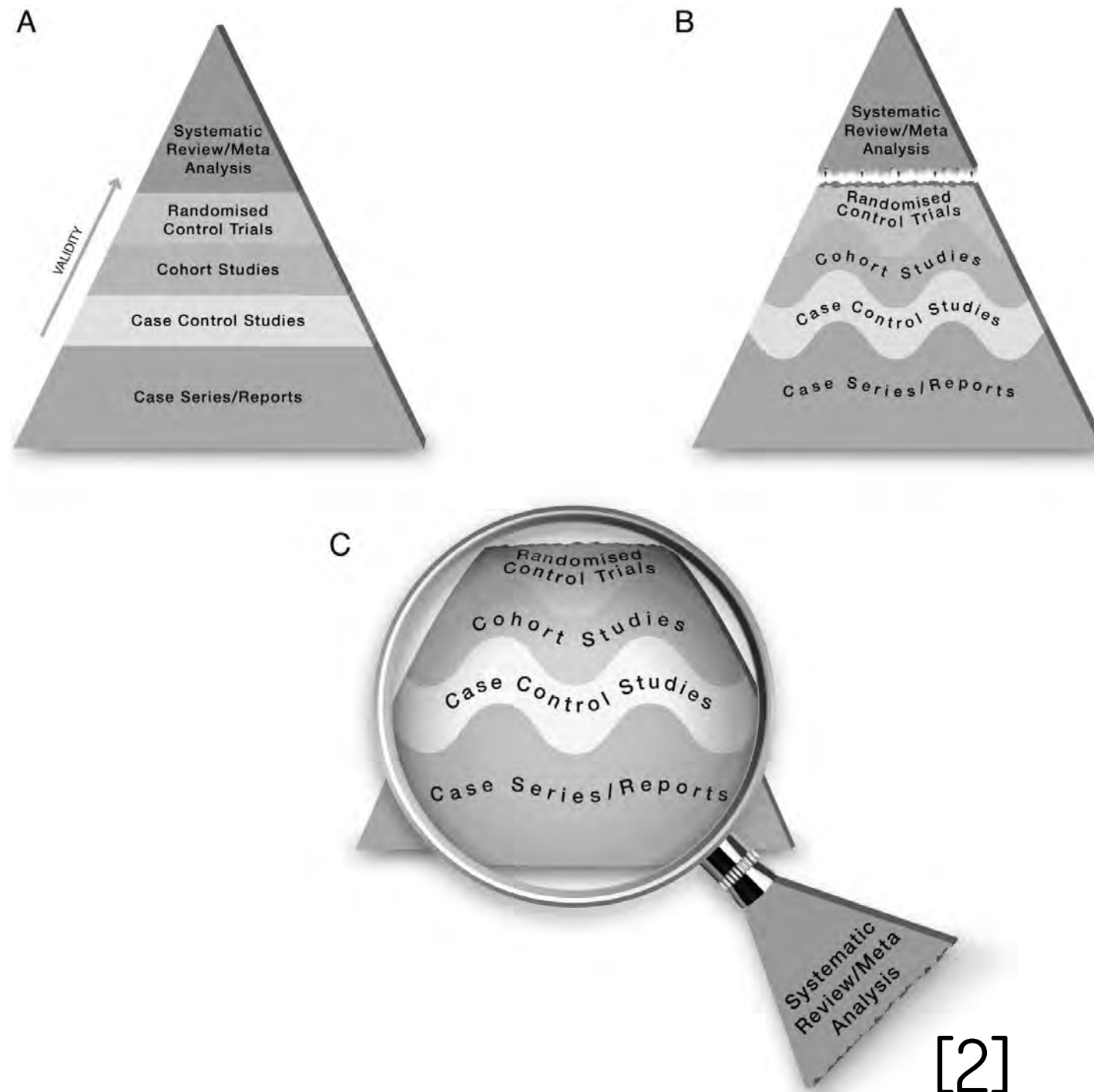
Meta-analysis

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
 Research question	Broad and not structured	Structured, clear, specific, and focused on a well defined clinical problem
 Literature search and source selection	Not detailed, not systematic, and not aimed at locating all available studies High probability of bias	Detailed, systematic, and explicit
 Article selection	No selection criteria Not reproducible High probability of bias	Selection based on explicit criteria Uniform application of inclusion and exclusion criteria to all articles
 Assessment of study quality	No quality assessment	Critical appraisal and evaluation of the methodological quality of the studies
 Synthesis	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
 Interpretation	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 ²³	1	Databases, reference management software optional	No	No	N/A	Epidemiology of heart disease: the influence of socioeconomic position. ⁵ Factors associated with increased health care utilization for patients with dementia with Lewy bodies: a narrative review. ⁶
Answer a clinical question	Systematic	12-24 months or more ²³	2 ⁷	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	PRISMA ⁸	Hypothermia for neuroprotection in adults after cardiac arrest. ¹³
Statistical combination of data from studies to determine effect	Meta- analysis	12 months or more	3 ⁷	Databases, screening software, appraisal templates, extraction tools, reference management software, statistical analysis	Yes	Yes	PRISMA ⁸	The Inflammatory Bowel Disease Questionnaire in randomized controlled trials of treatment for ulcerative colitis: systematic review and meta-analysis. ¹⁴
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 ²⁴	Social determinants of health and health inequities in breast cancer screening: a scoping review. ¹⁷
Answer a clinical question, often for rapid public health response	Rapid	1-6 months ¹⁸	1 ¹⁸	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 ¹⁹
Explore quantitative and qualitative studies to provide evidence for practice and in context of theoretical frameworks	Integrative	6-12 months ²³	2	Databases, screening software, appraisal templates, extraction tools, reference management software	Yes	Yes	PRISMA ⁸ suggested	Usefulness of nursing theory- guided practice: an integrative review. ²¹
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 ⁸ Suggested	Breast cancer genetic mutation: synthesis of women's experience. ²²

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

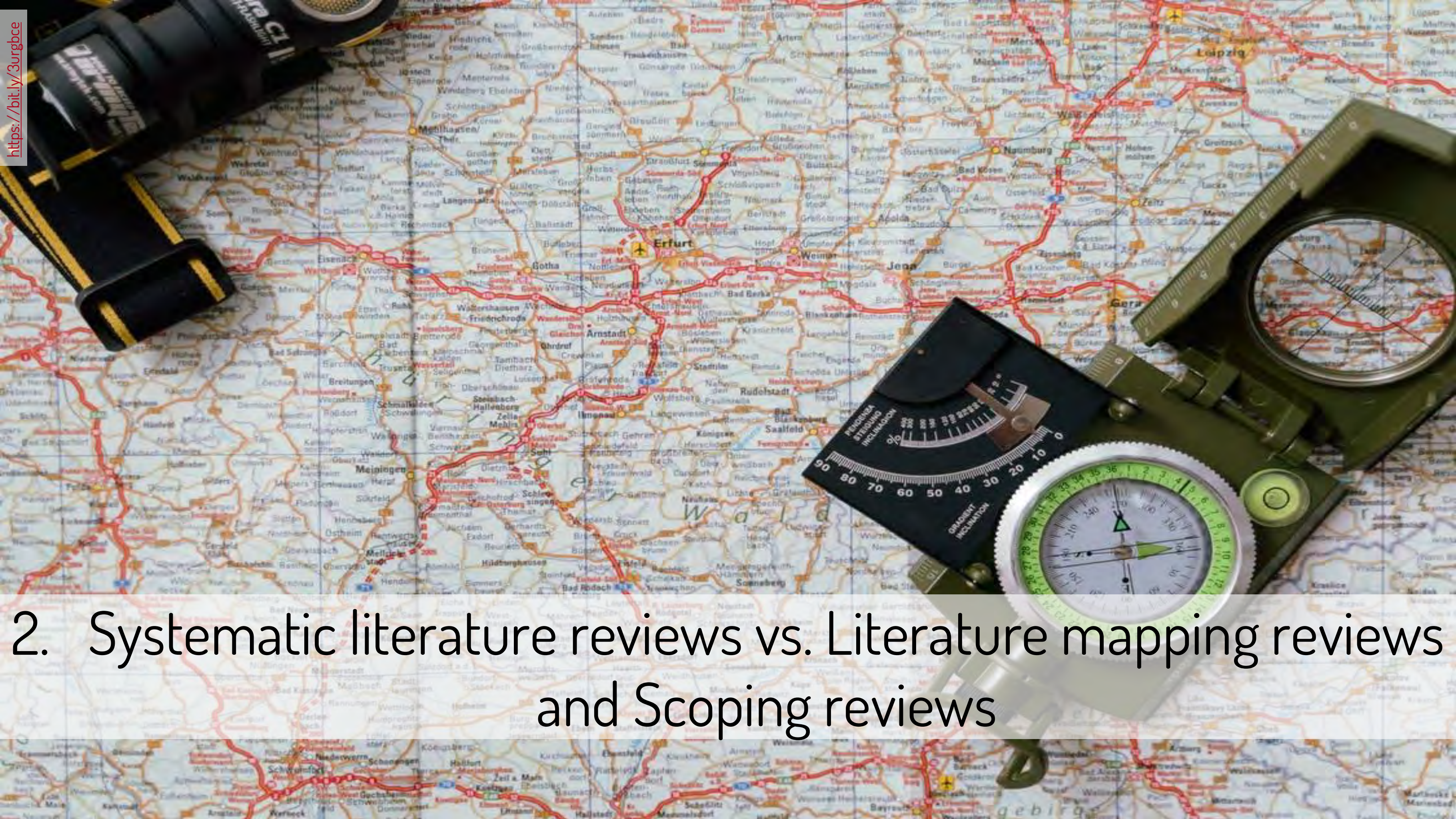
(a) Exploratory research; scope of evidence; Existing gaps
b) Rigorous synthesis in a rapid manner (time limitation)
a+b: Review process = systematic review

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

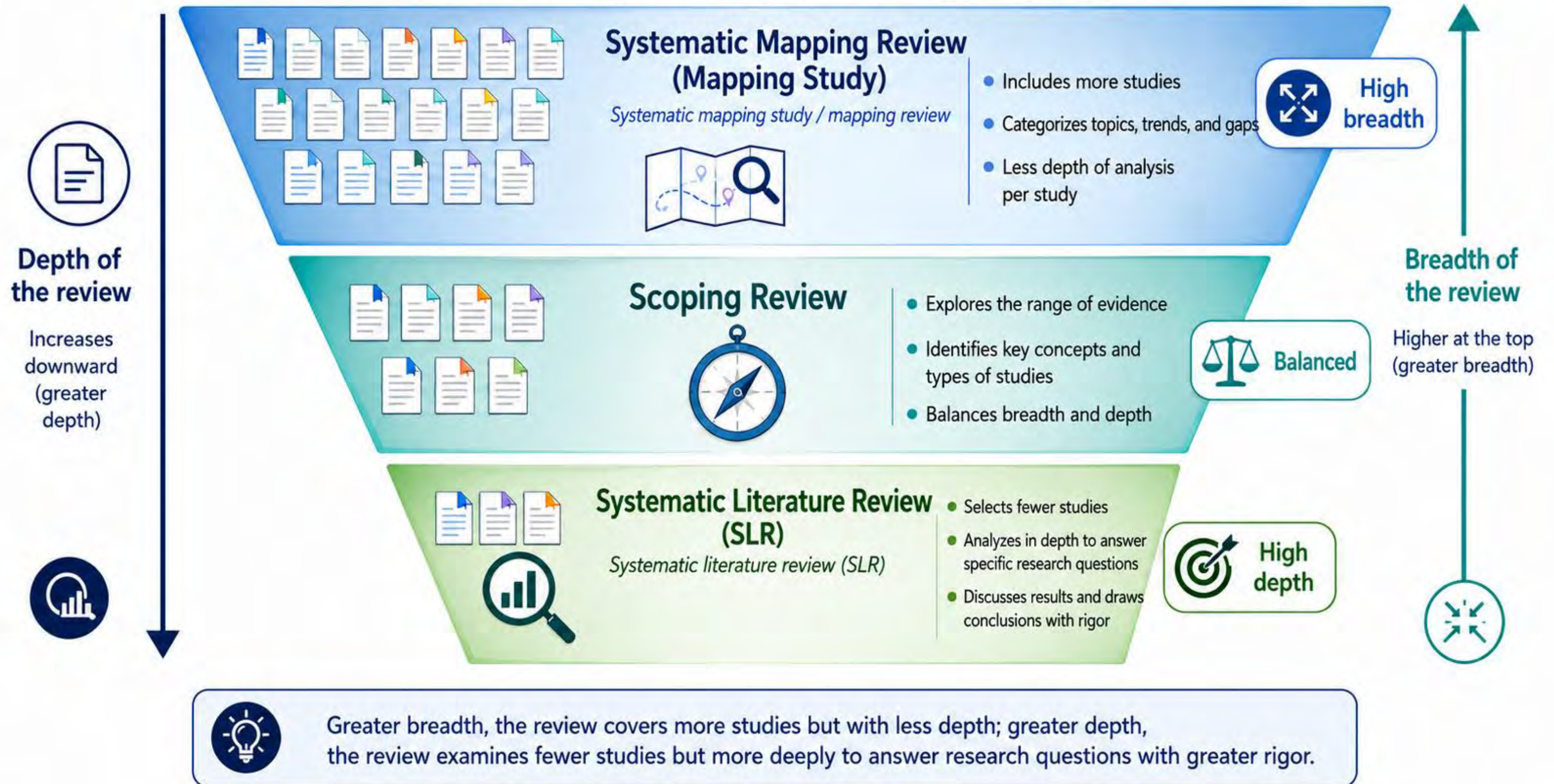


- Inductive or deductive approach
- More detailed data extraction
- Narrower focus on a broad issue
- Less than 40-80 studies
- It can include iterative processes in the search, extraction and analysis of the data
- May include qualitative analysis

- 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]



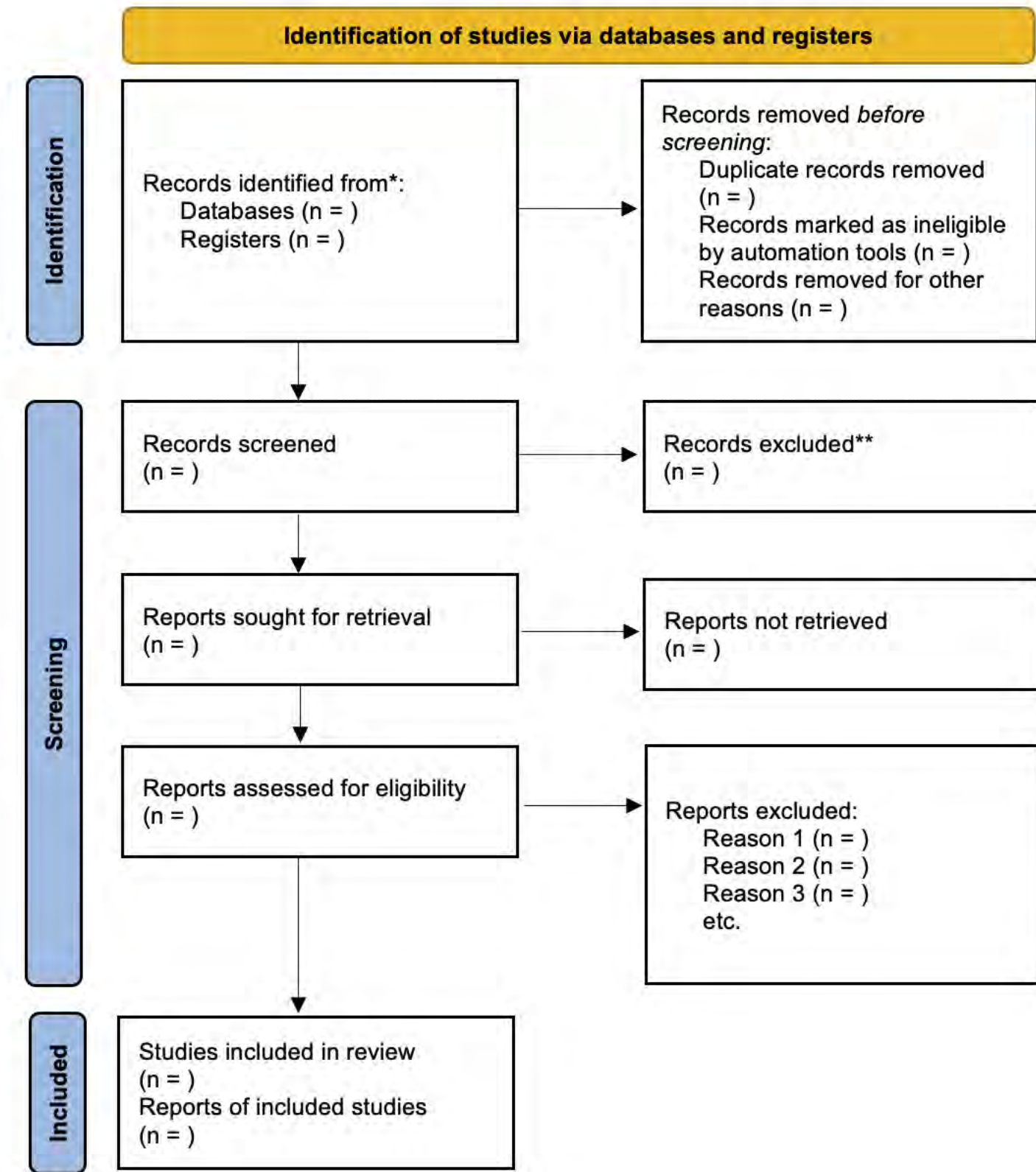
PRISMA 2020 Checklist			
Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
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
RESULTS			
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 <u>estimate</u> 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.	
DISCUSSION			
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.	
OTHER INFORMATION			
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>



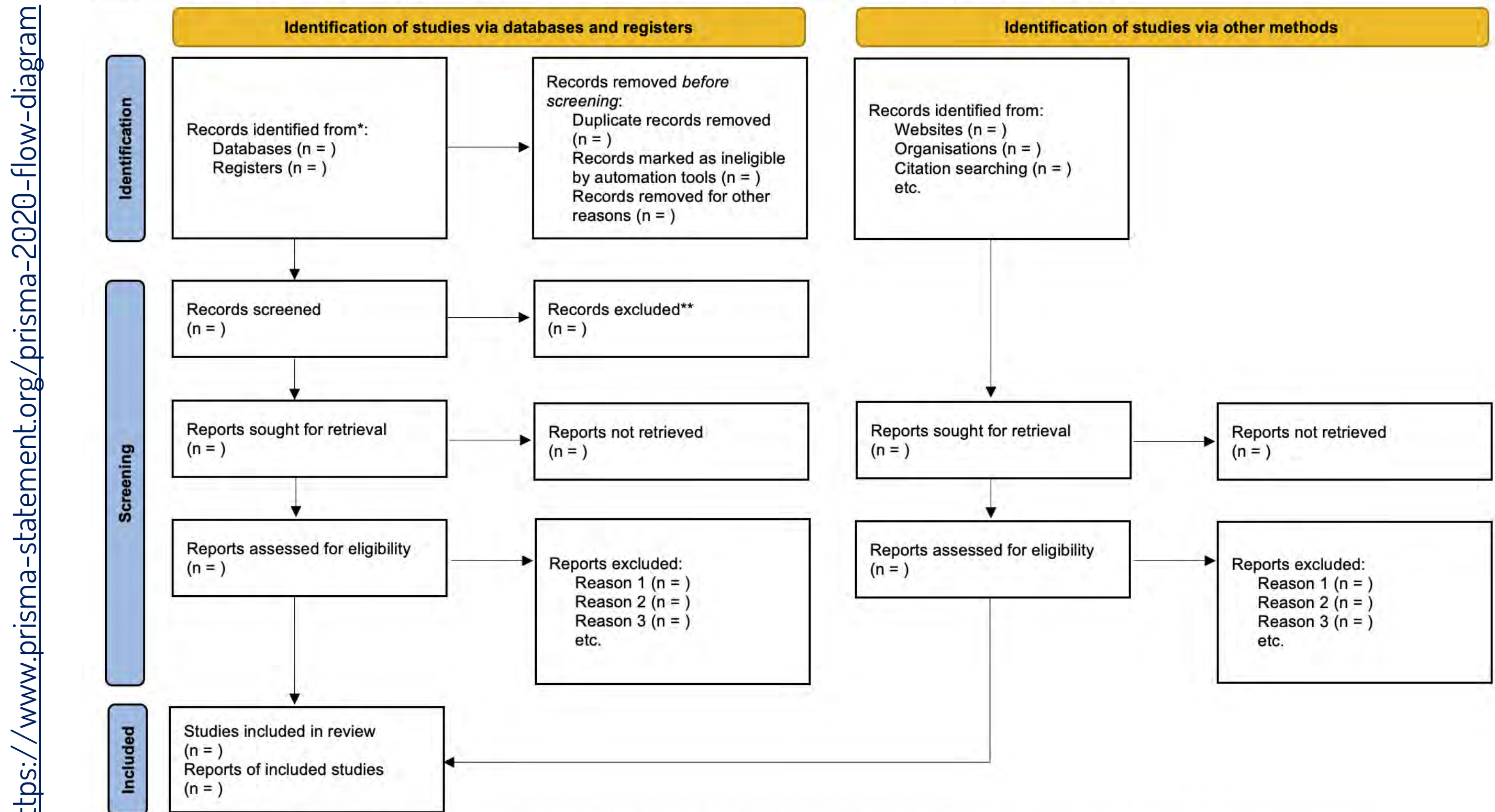
*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

**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

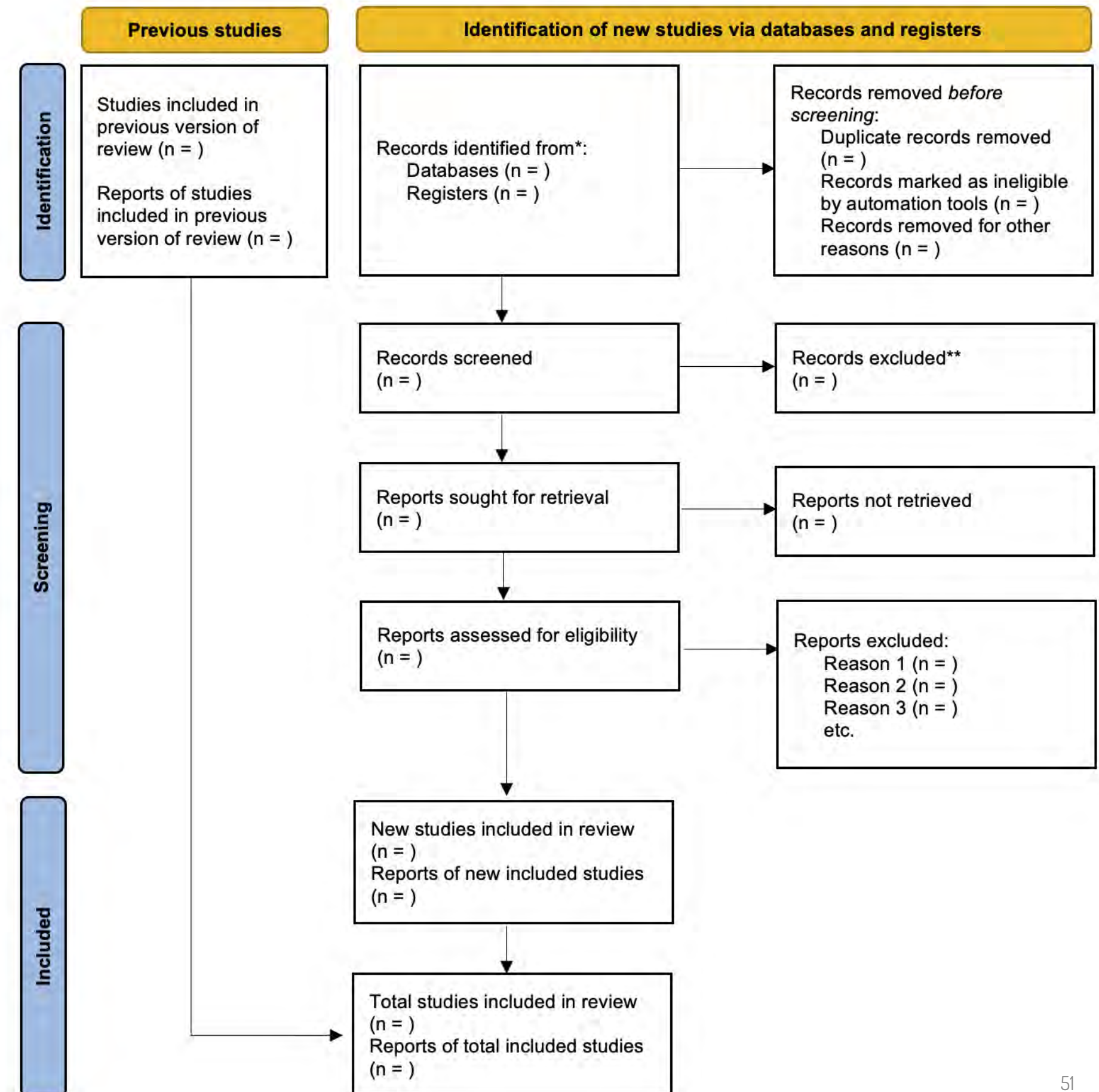


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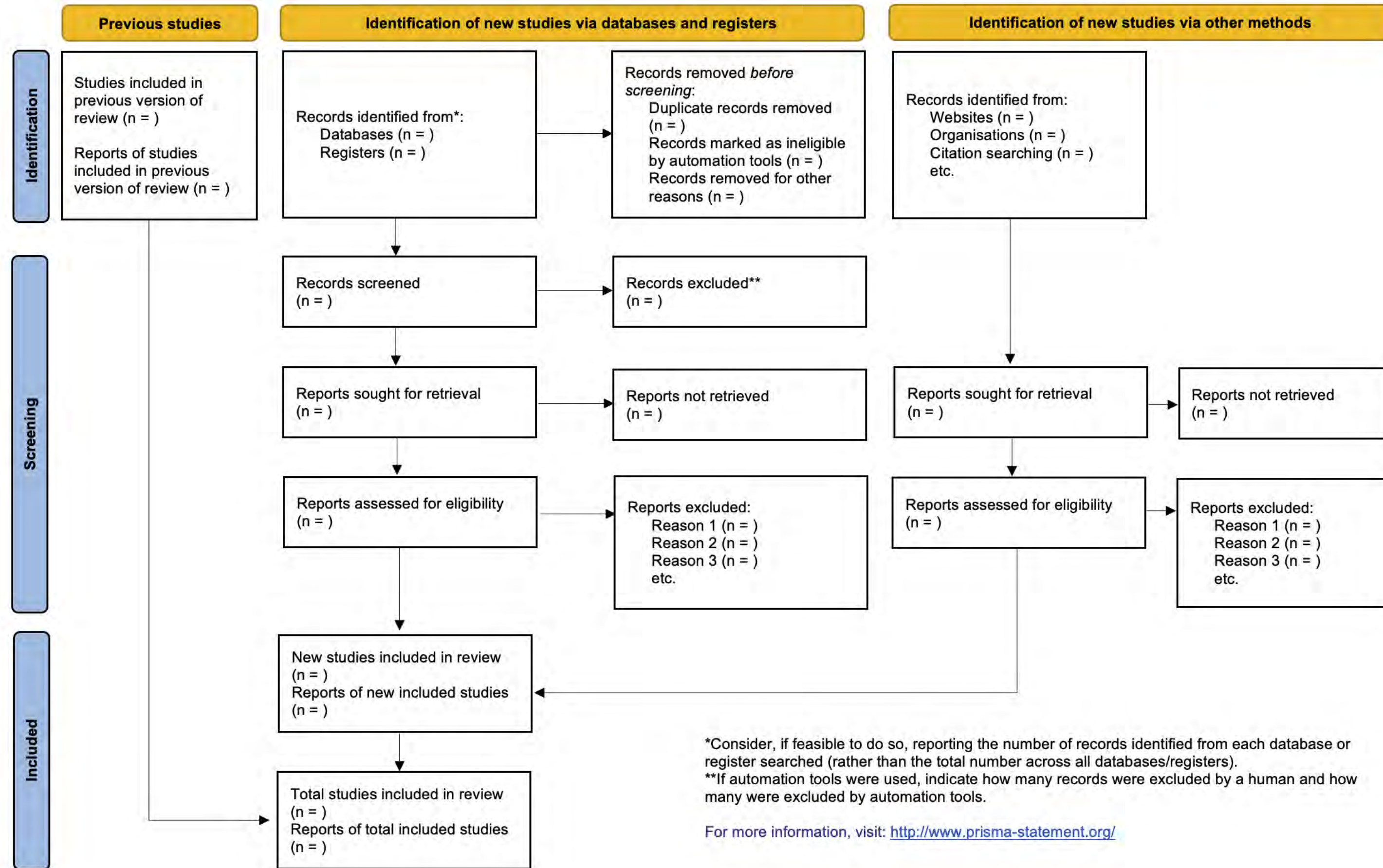
<https://www.prisma-statement.org/prisma-2020-flow-diagram>



PRISMA 2020 Flowchart [56,57]

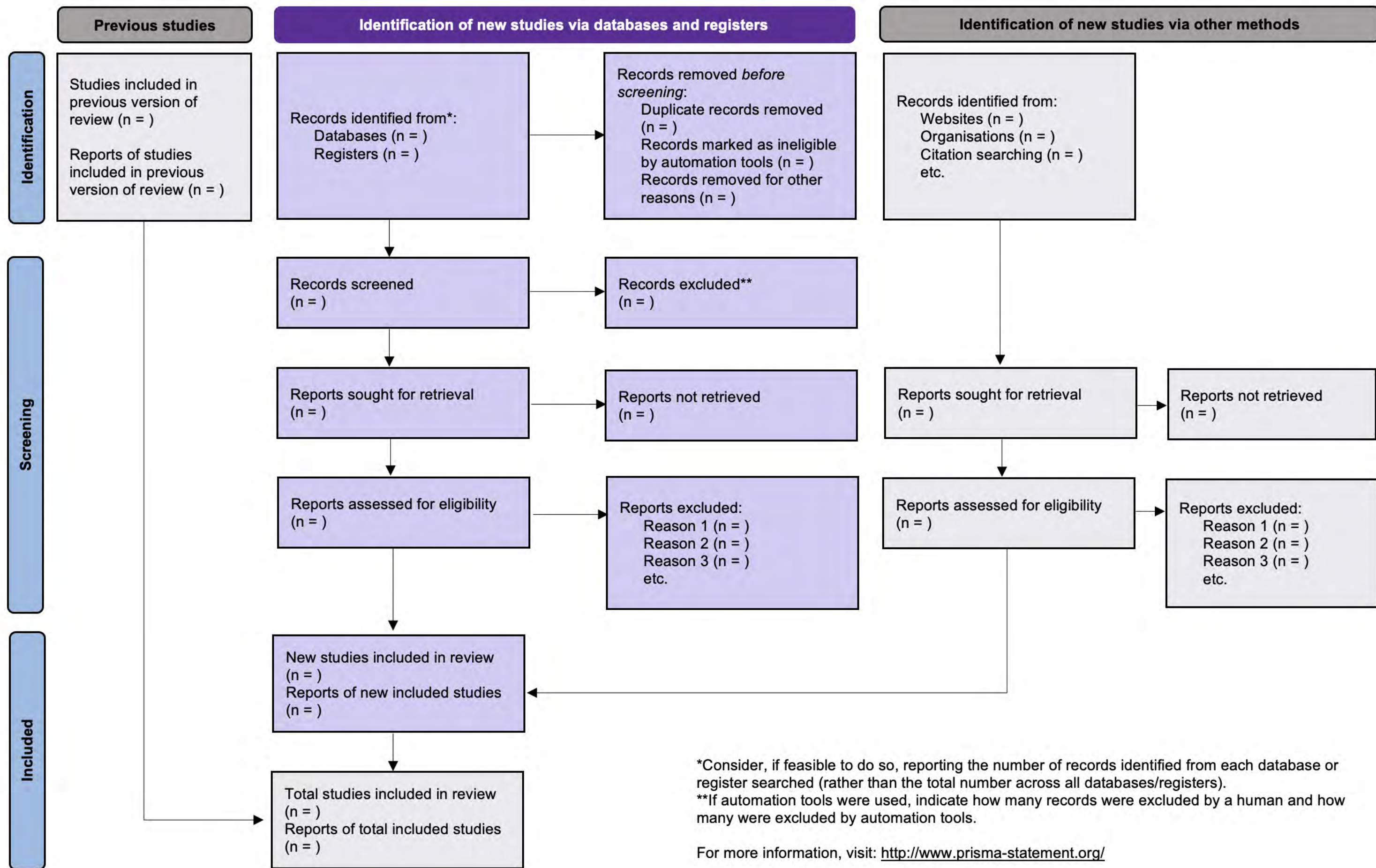
<https://www.prisma-statement.org/prisma-2020-flow-diagram>

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



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 #
TITLE			
Title	1	Identify the report as a scoping review.	
ABSTRACT			
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.	
INTRODUCTION			
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.	
METHODS			
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 #
RESULTS			
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.	
DISCUSSION			
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.	
FUNDING			
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.	

JB1 = 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 JB1 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

- **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

- **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 separate appraisal 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 characterise both literatures and look for correlations between characteristics or use gap analysis to identify aspects absent in one literature but missing in the other
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

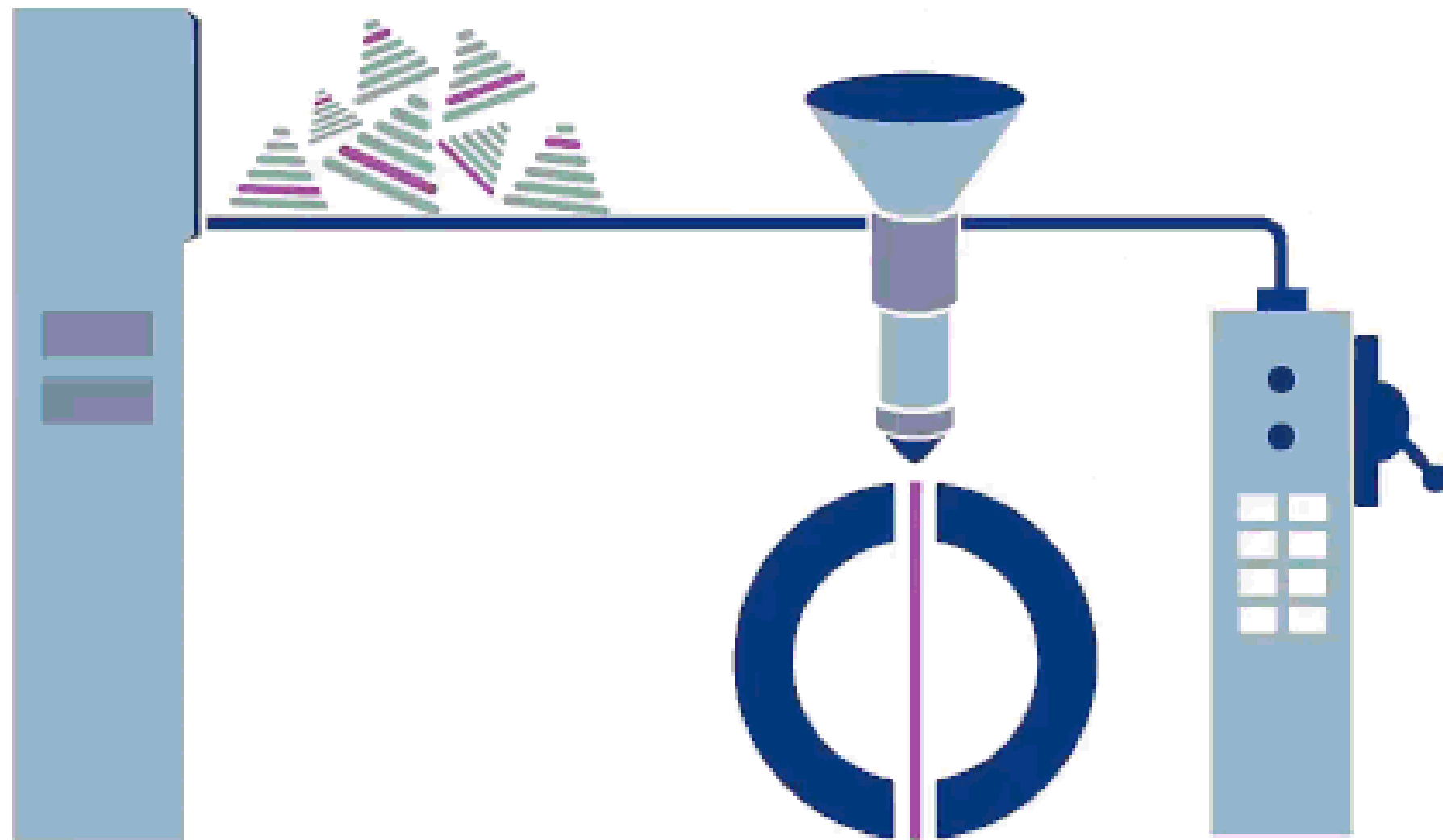
Types of revision characterized using the SALSA framework ^[13]

1 Continued					
	Description	Methods used (SALSA)			
		Search	Appraisal	Synthesis	Analysis
1 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 literature, overall quality, effect of literature
2 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 content of literature, potential for design and other effects
3 review	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 knowledge and priorities for investigation and research
4 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, future research
5 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
6 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 finding methodology
7 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 to be researched

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



1st question

- **Is a systematic review necessary?**

You must ask yourself what hypothesis is being tested and how you know that a revision is needed. Are you sure that there is no systematic review already? Who is going to use the results of the review, and how?

2nd question

- **Do you have the resources?**

A systematic review can be costly in terms of time, energy, money, and the reviewer. Do you have the resources? Do you know what it could entail? Do you have the support of information to assist in the search, and the funds to cover obtaining copies of articles and books? Do you have other review authors to help with the sourcing and selection of studies for the review?

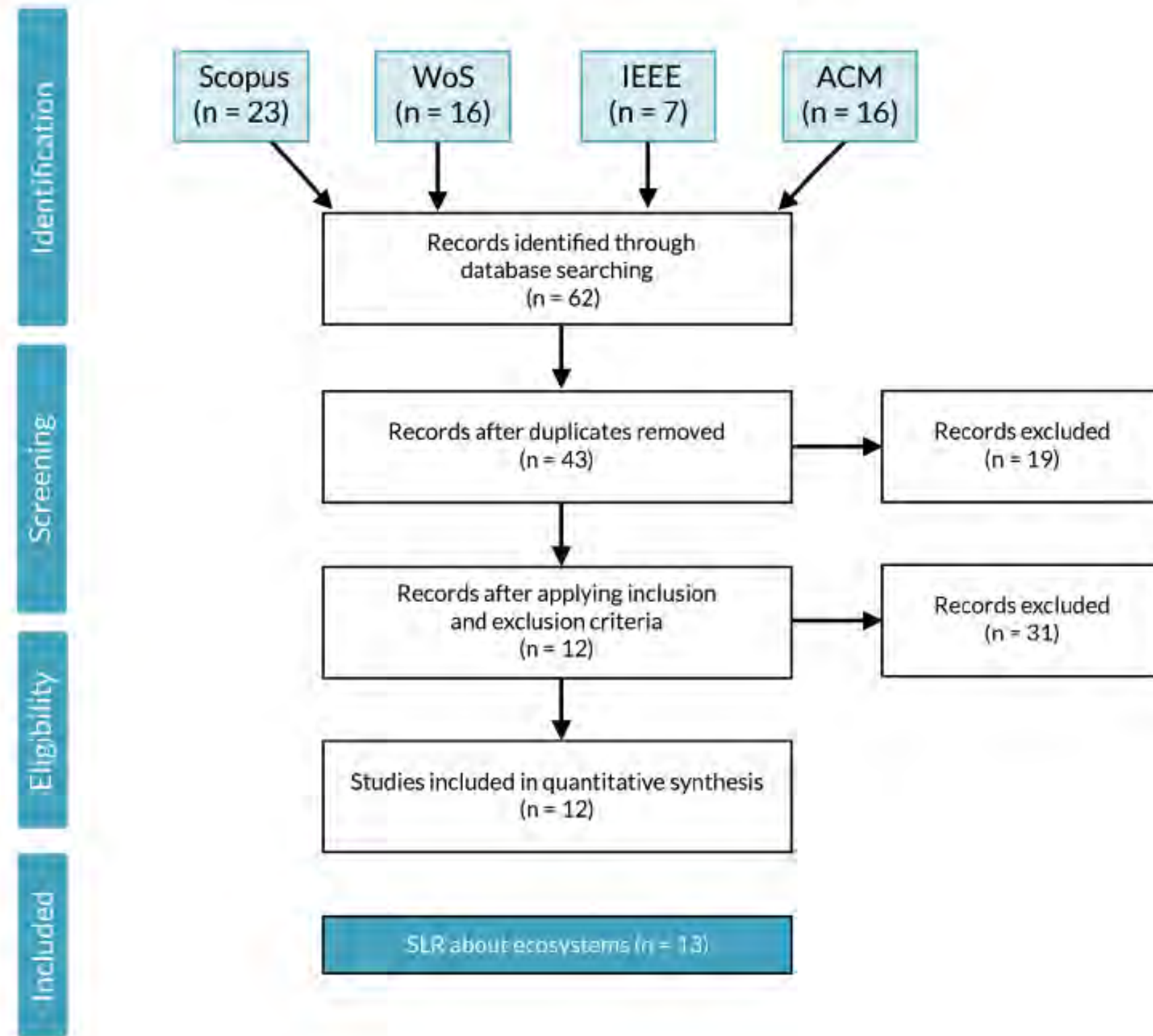
Is the systematic review continuing?

- 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>	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). 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.
<i>Comparison</i>	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: • buses versus trams for urban congestion; • natural versus chemical methods of agricultural pest control; • surgery versus drugs for an illness.
<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

- Types of databases
 - 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
- IEEEExplore
- 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

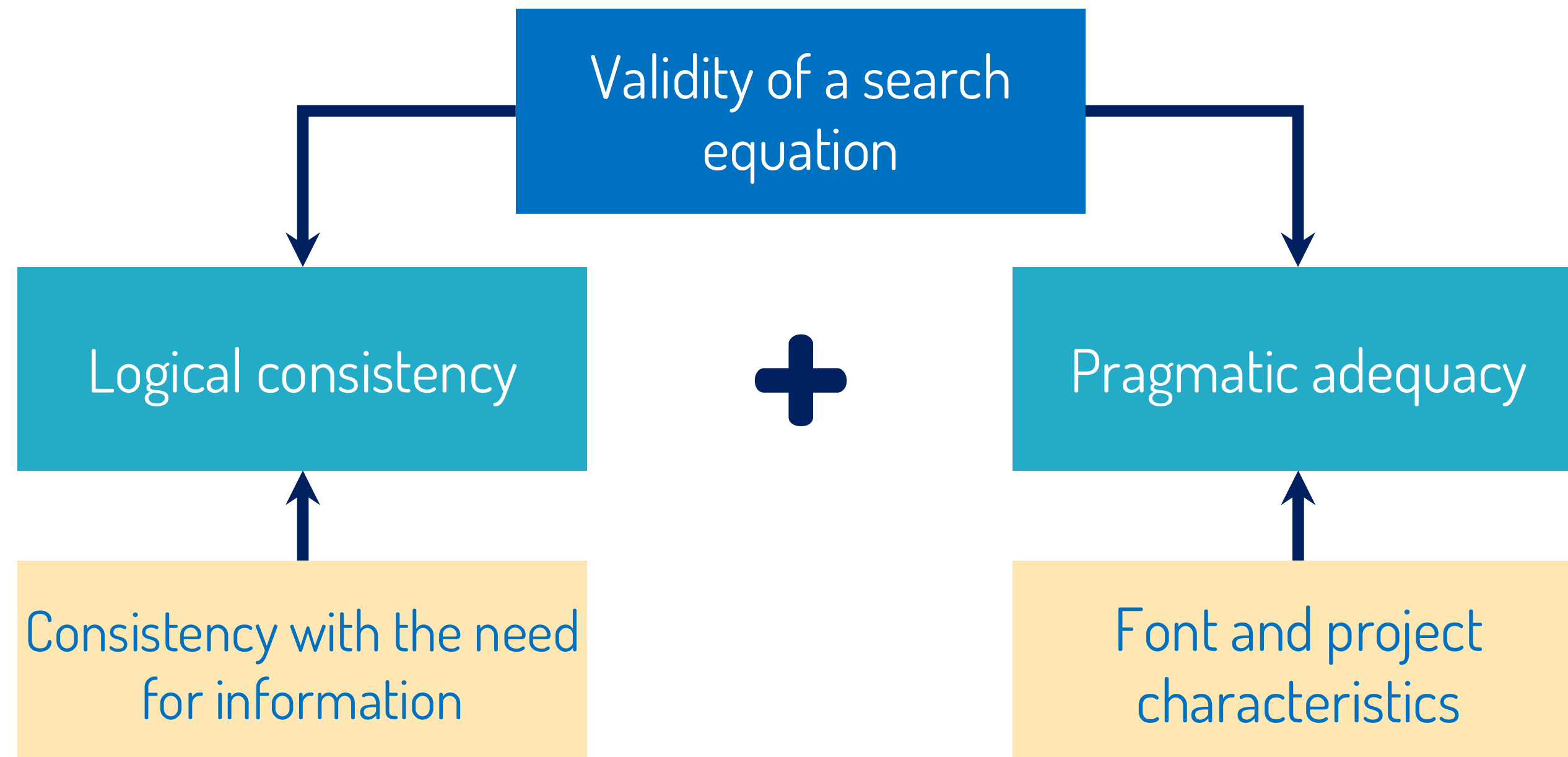
- An effective search equation would be one formed by descriptors and their corresponding qualifiers combined with each other using the most appropriate Boolean operators [11]
 - To join related concepts, the OR (union) operator will be used. For example, synonyms are related to each other with the OR 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”)))*

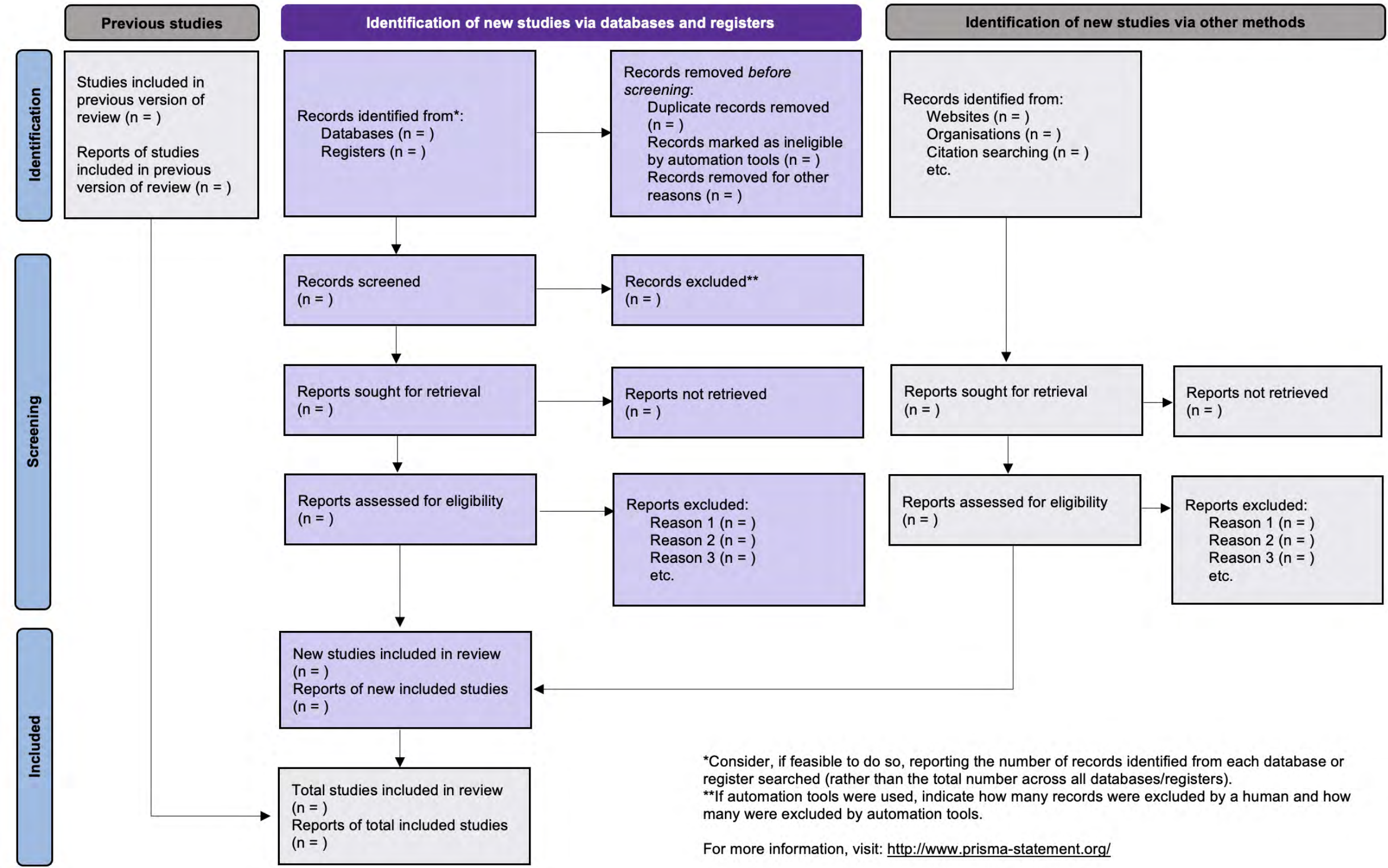
Validity condition of a search equation [75]

- 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

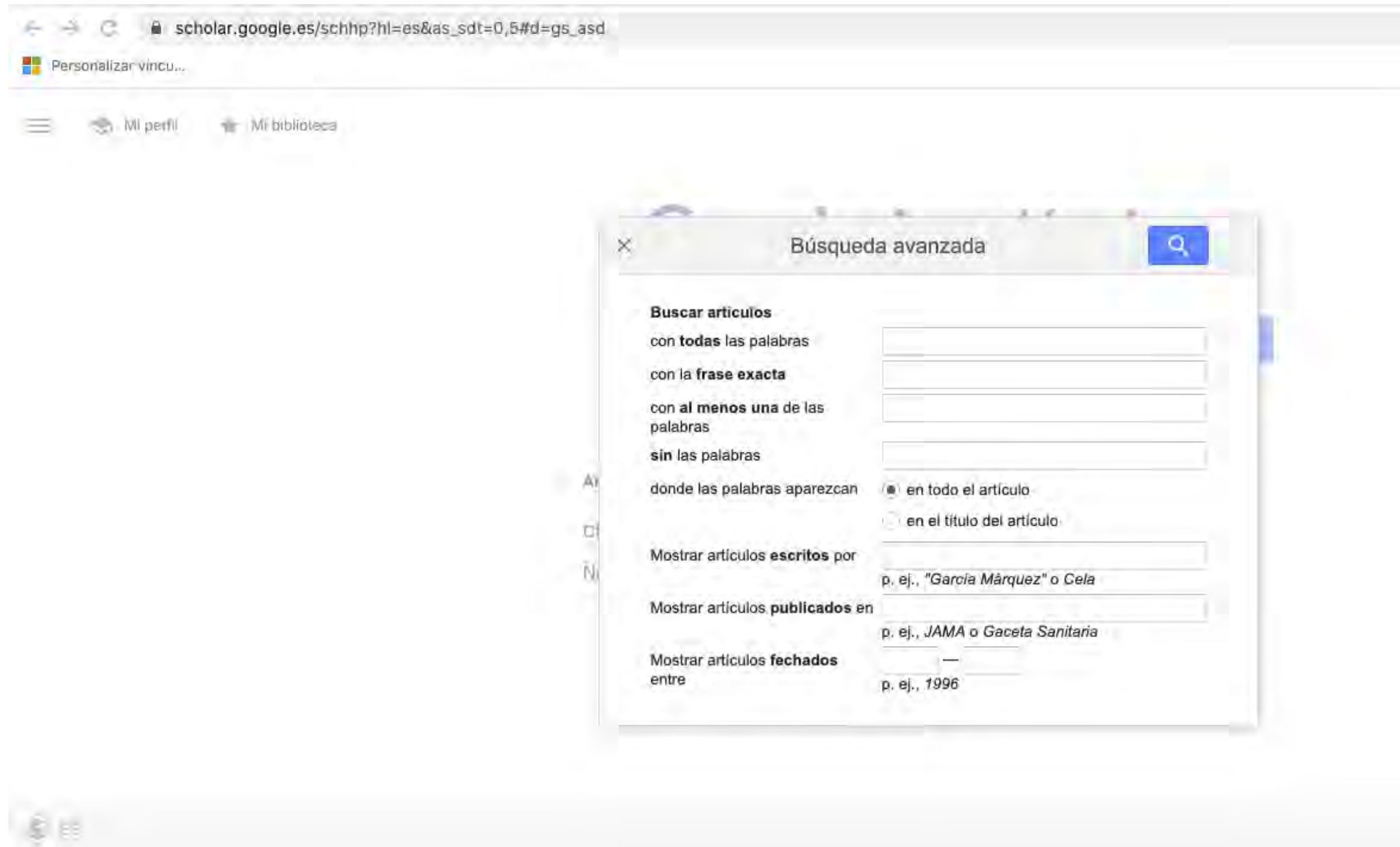


The screenshot shows the Web of Science search interface. At the top, there is a navigation bar with the Clarivate logo, language options (English), and product links. Below this, the 'Web of Science' logo is followed by links for Search, Marked List, History, and Alerts. A 'Sign In' link and a 'Register' button are also present. The main header area has a purple background with the text 'Discover multidisciplinary content from the world's most trusted global citation database.' Below this, a search box is open, showing the 'Search in: Web of Science Core Collection' dropdown. The search box has tabs for 'DOCUMENTS', 'AUTHORS', and 'CITED REFERENCES'. The 'All Fields' dropdown is open, showing a list of searchable fields: All Fields, Topic, Title, Author, Publication Titles, Year Published, Affiliation, and Publisher. The 'All Fields' option is selected. The search box also contains a text input field with the placeholder 'Example: look 30 years into the past'. To the right of the input field are 'CLEAR' and 'SEARCH' buttons. Below the dropdown, there is a description of the 'All Fields' search option: 'Searches all of the searchable fields using one query. This allows you to easily find your search terms in any field.' An example query is provided: '2014 drexel decay radioactiv*'. The interface is clean and professional, with a focus on providing a clear and easy-to-use search experience.

Scopus search interface

A screenshot of the Scopus search interface. The top left features the University of Salamanca logo and the Scopus logo. The top right has navigation links: Search, Sources, Lists, SciVal, a help icon, a notification bell, a login icon, and buttons for "Create account" and "Sign in". The main section is titled "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 contains a dropdown menu for "Search within" (set to "Article title, Abstract, Keywords") and a text input field "Search documents *". To the right of the search bar is a "Search tips" link. Below the search bar are links for "+ Add search field", "+ Add date range", and "Advanced document search >". A blue "Search" button is on the right. The footer is divided into three columns: "About Scopus" (with links: What is Scopus, Content coverage, Scopus blog, Scopus API, Privacy matters), "Language" (with links: 日本語に切り替える, 切换到简体中文, 切换到繁体中文, Русский язык), and "Customer Service" (with links: Help, Contact us). The bottom of the page features the Elsevier logo, copyright information, a cookie notice, and the RELX logo.

Google Scholar advanced search interface



The screenshot shows the Google Scholar advanced search interface. At the top, the browser address bar displays the URL: `scholar.google.es/schhp?hl=es&as_sdt=0,5#d=gs_asd`. Below the address bar, there are links for "Personalizar vincu..." and "Mi perfil". The main search area is titled "Búsqueda avanzada" and contains several search options:

- Buscar artículos**
 - con **todas** las palabras
 - con la **frase exacta**
 - con **al menos una** de las palabras
 - sin** las palabras
- donde las palabras aparezcan
 - ☒ en todo el artículo
 - ☐ en el título del artículo
- Mostrar artículos **escritos** por
 - p. ej., "García Márquez" o Cela
- Mostrar artículos **publicados** en
 - p. ej., JAMA o Gaceta Sanitaria
- Mostrar artículos **fechados** entre
 - p. ej., 1996

ScienceDirect advanced search interface

← → ↺ sciencedirect.com/search

Personalizar vincu... Otros marcadores Lista de lectura

ScienceDirect Journals & Books ?  Register Sign in  UNIVERSIDAD DE SALAMANCA

Advanced Search

Search tips ?

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

ISSN or ISBN

Search 

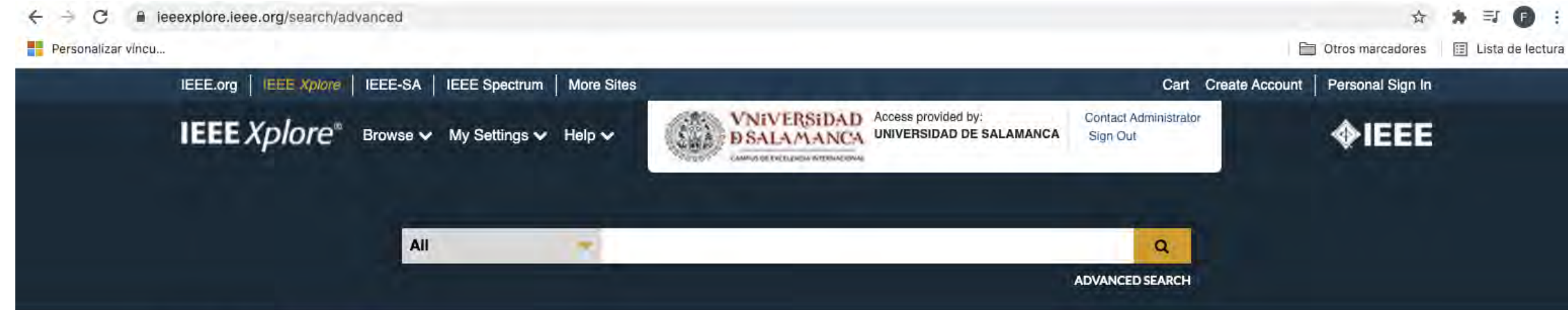
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 RELX™

Feedback 

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

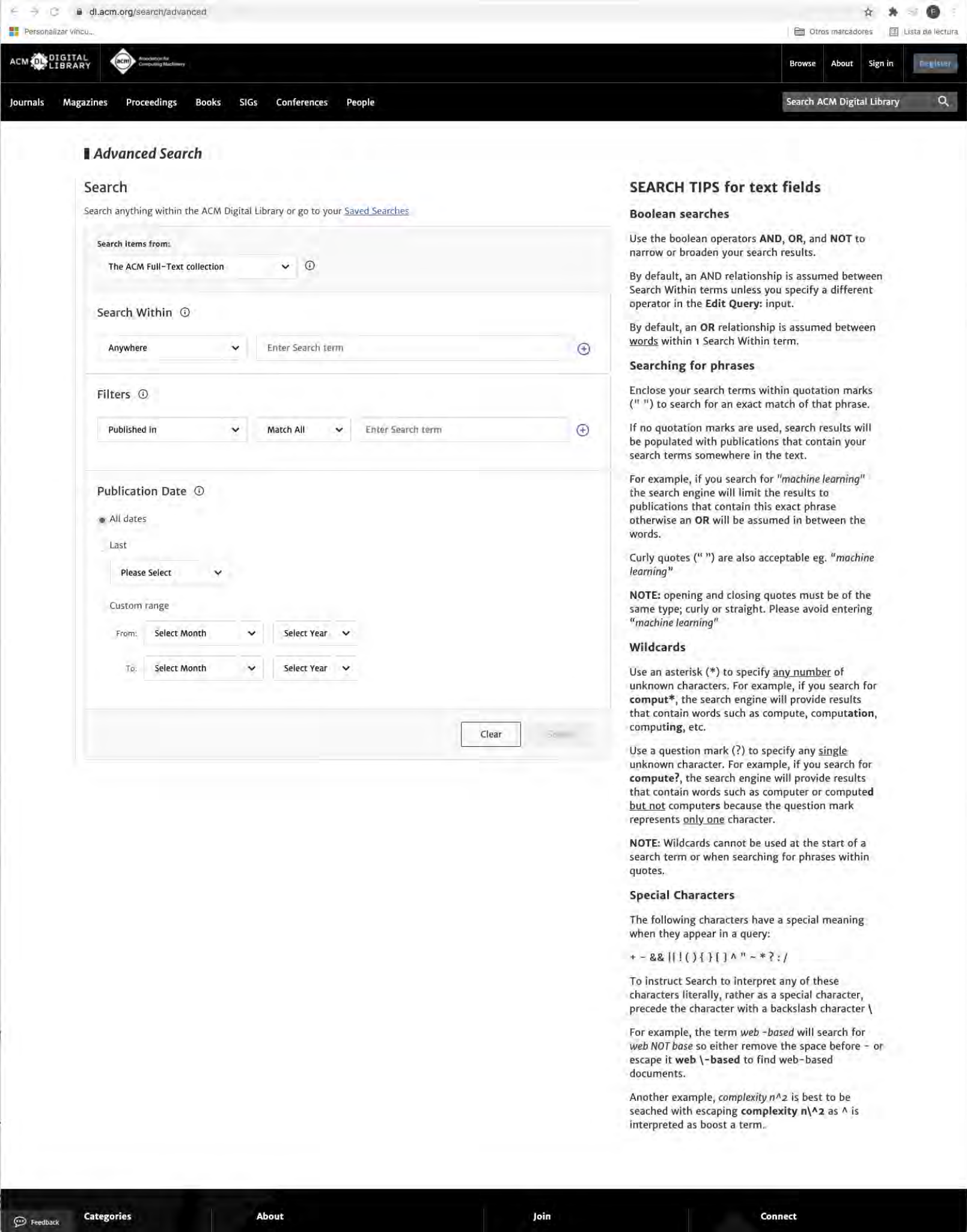
☐ Specify Year Range

1884	2021
	
From	To
1884	2021

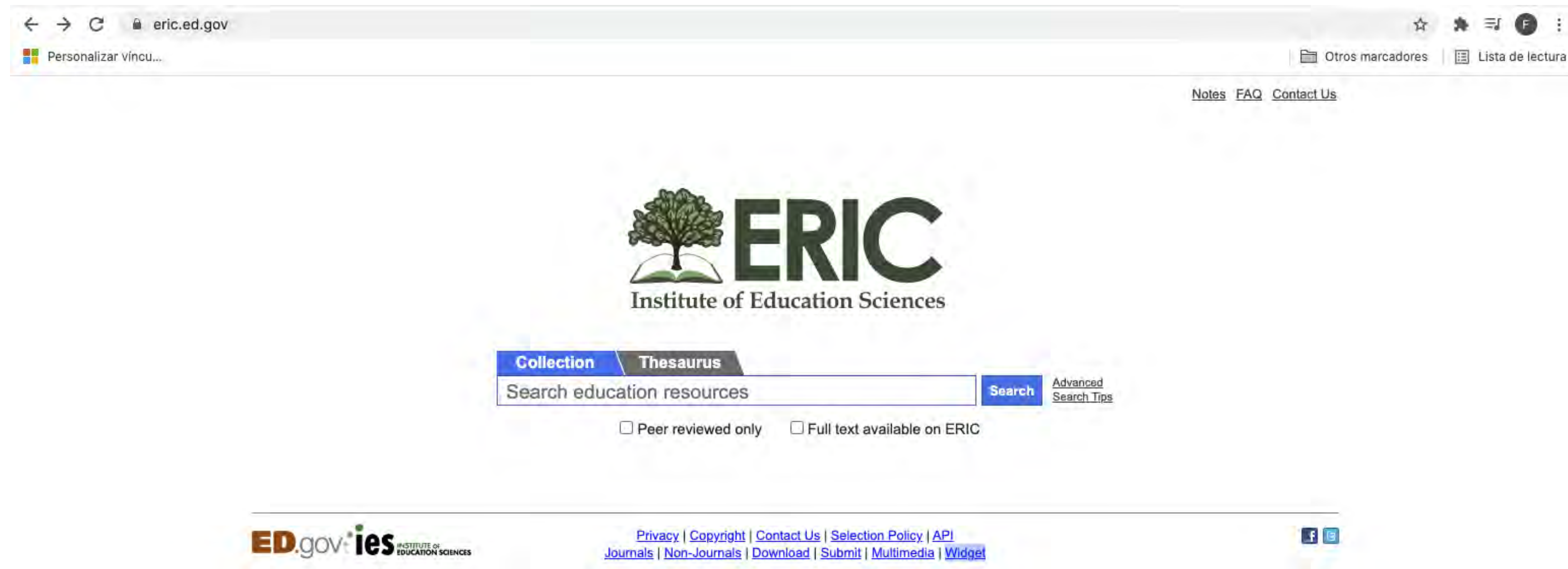
[Reset All](#)

[Search](#)

ACM Digital Library advanced search interface



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 growing from 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". To the right of the search bar is a "Search" button and a link to "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". Social media icons for Facebook and Twitter are also present.



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 automoto*]

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

A screenshot of the Scopus search interface. At the top, there is a header with the University of Salamanca logo and name, the Scopus logo, and navigation links for Search, Sources, Lists, and SciVal. There are also links for "Create account" and "Sign in". Below the header, the text "Start exploring" is followed by 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 "Documents" tab is selected. A search bar contains the text "Search documents * dashboard* PRE/10 custom*". Below the search bar, there are three filter sections: "Published from 2015", "To Present", and "Added to Scopus Anytime". These three filter sections are grouped together and highlighted by a large blue oval. Below the filters, there are links for "Add search field", "Remove date range", and "Advanced document search". There are also "Reset" and "Search" buttons. At the bottom of the page, 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, 切换到繁体中文, Русский язык), and "Customer Service" (Help, Contact us). The footer includes the Elsevier logo, links for "Terms and conditions" and "Privacy policy", copyright information, a cookie notice, and the RELX logo.

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

Article (24) >

Review (15) >

Book Chapter (2) >

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

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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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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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View abstract View at Publisher Related documents

View abstract View at Publisher Related documents

View abstract View at Publisher Related documents



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

Advanced WoS query



Clarivate

EnglishProducts

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

Example: (overdose AND drug)

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"

YOUR SEARCHES E.G. #5 AND #2

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



Clarivate

EnglishProducts

Web of Science™

SearchMarked ListHistoryAlerts

Sign InRegister

[< BACK TO BASIC SEARCHES](#)

Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

All Fields

dapt* OR flexib* OR config* OR driven OR generat* OR compos* OR template* OR context-aware OR select* | >

ADD TO QUERY

More options

Query Preview

Enter or edit your query here. You can also combine previous searches e.g. #5 AND #12

Field Tags

Booleans: AND, OR, NOT

Field Tags:

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

DOP=Publication Date

ALL=All Fields

CLEAR

SEARCH

History

Your history is currently empty.

All your searches in the current session will appear here.

Advanced WoS query



Clarivate

EnglishProducts

Web of Science™

SearchMarked ListHistoryAlerts

Sign InRegister

[< BACK TO BASIC SEARCHES](#)

Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

All Fields

Dashboard (over disease) (no=any)

And

ADD TO QUERY

More options

Query Preview

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*))

Field Tags

Booleans: AND, OR, NOT

Field Tags:

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

DOP=Publication Date

ALL=All Fields

X CLEAR

SEARCH

History

Your history is currently empty.

All your searches in the current session will appear here.

Advanced WoS query



Clarivate

EnglishProducts

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*)

×

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

×

CLEAR

SEARCH

Booleans: AND, OR, NOT

Field Tags:

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

DOP=Publication Date

ALL=All Fields

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Advanced Search Query Builder

Search in: Web of Science Core Collection

Add terms to the query search preview

Topic

Example of oil spill mitigation

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

X CLEAR

SEARCH

Booleans: AND, OR, NOT

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

Less options ▾

Select citation indexes from Web of Science Core Collection

All citation indexes

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 ▾ X CLEAR SEARCH

Booleans: AND, OR, NOT

Field Tags:

TS=Topic	SO=Publication Titles	CI=City	IS= ISSN/ISBN
TI=Title	DOI=DOI	PS=Province/State	UT=Accession Number
AB=Abstract	PY=Year Published	CU=Country/Region	PMID=PubMed ID
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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	

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Search in: Web of Science Core Collection

Add terms to the query search preview

Topic

Example of oil spill remediation

And

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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

TI=Title

AB=Abstract

AU=Author

AI=Author Identifiers

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How to Conduct a Systematic Literature Review?

138

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Search in: Web of Science Core Collection

Add terms to the query search preview

Topic

Example: "naltrexone" OR "meditation"

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

X CLEAR

SEARCH

Booleans: AND, OR, NOT

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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:

TS=Topic

TI=Title

AB=Abstract

AU=Author

AI=Author Identifiers

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GP=Group Author

ED=Editor

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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...

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Refine results

Search within results for...

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Early Access8

Open Access150

EXCLUDEREFINE

Publication Years

Search for Publication Years

Select allDate

202117

202070

201948

201838

201734

201623

201510

201412

201314

20126

20115

20106

20096

20085

20072

20064

20051

20041

20032

20011

19991

19952

19931

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Document Types

Articles271

Meeting Abstracts17

Editorial Materials12

Early Access9

Review Articles8

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Relevance

<1of 7>

1

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 dashboards ... Show more

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73References

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 ***

47References

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, their sustainability is ... Show more

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103References

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 and analysis ... Show more

Full Text at Publisher ***

30References

Related records

5

Features Constituting Actionable COVID-19 Dashboards: Descriptive Assessment and Expert Appraisal of 158 Public Web-Based COVID-19 Dashboards

Ivankovic, D; Barbazza, E; (-); Krings, 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-19 pandemic ... Show more

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61References

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 application for ... Show more

View full text ***

21References

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 functional rhinoplasty ... Show more

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19References

Related records



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(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 for...

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

0/107 ADD TO MARKED LIST EXPORT

Relevance 1 of 3

1 Learning analytics dashboards for adaptive support in face-to-face collaborative argumentation

Han, J; Kim, KH; (...); Cho, YH

Apr 2021 Computers & Education

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73 References

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103 References

Related records

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Feb 24 2021 Journal Of Medical Internet Research

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61 References

Related records

4 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

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29 References

Related records

5 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

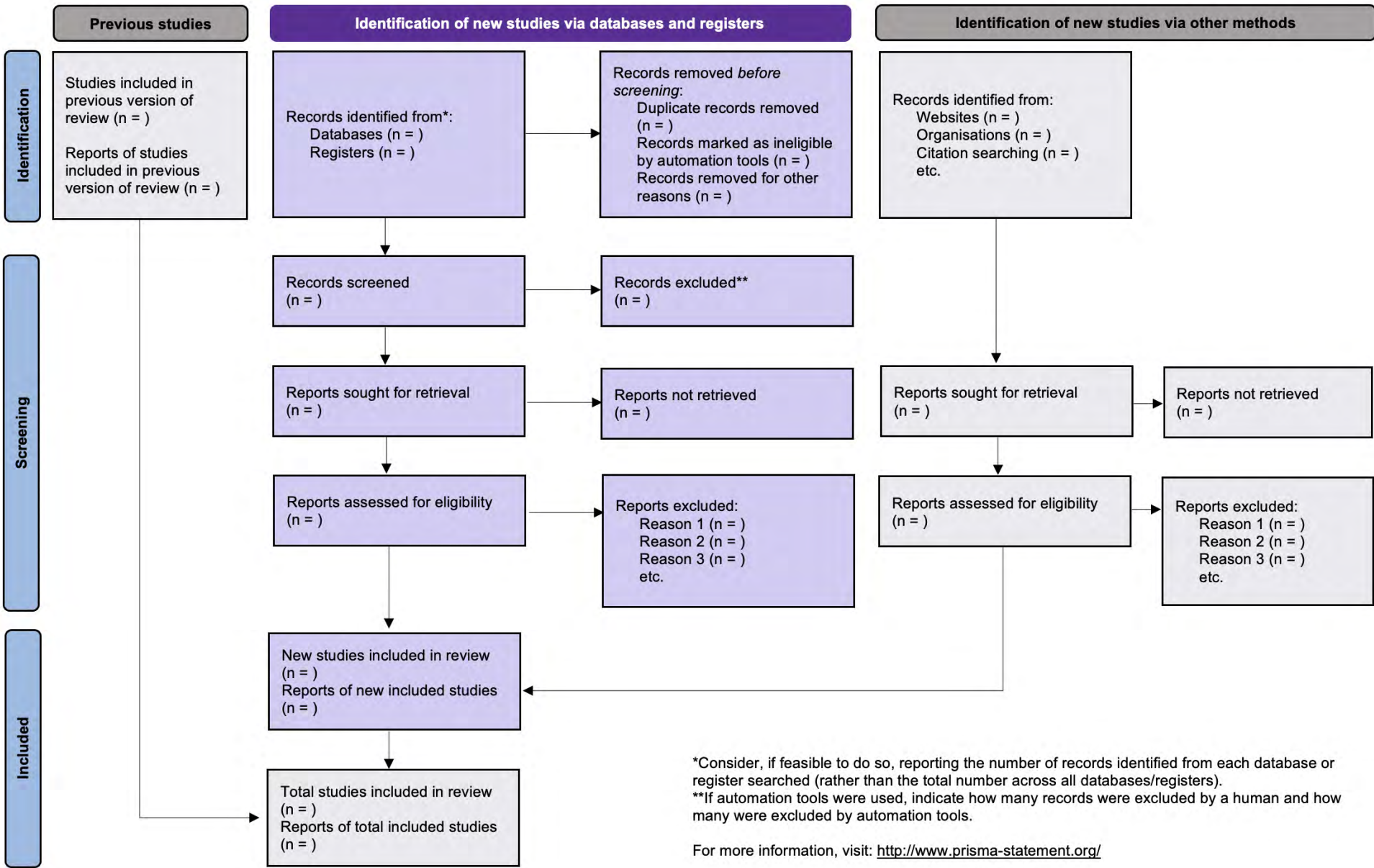
- The three-pass approach can be followed [78]. In each one, it is decided whether to continue reading
 - First pass – Gives an overview
 - Read the title, summary, and introduction in detail
 - Identify the internal structure of the article (sections and subsections) and ignore the rest
 - Read the 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

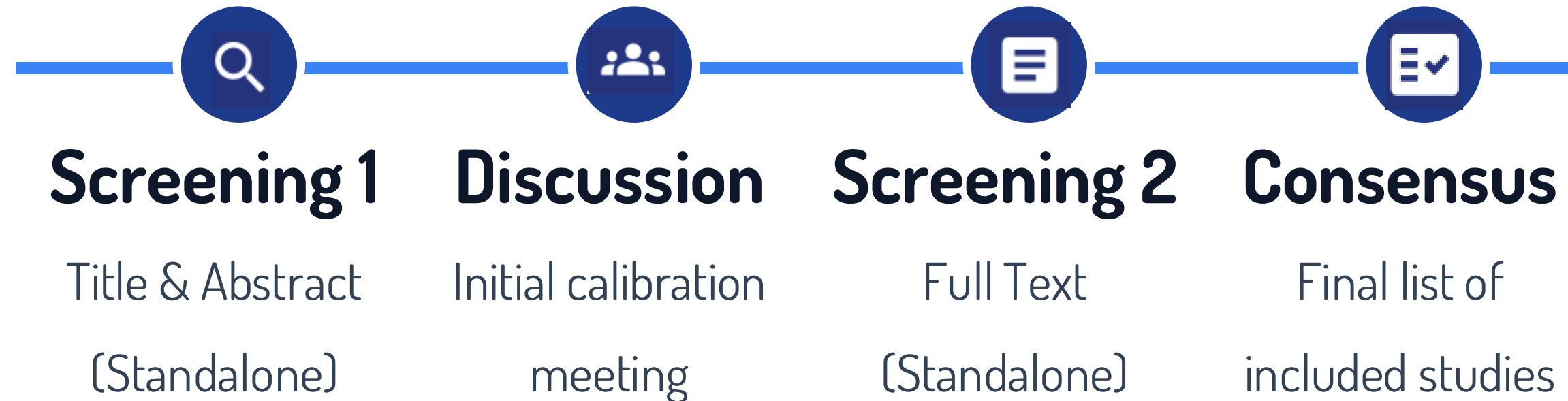
The standard requires that each record be processed in duplicate in isolation



Arbitration

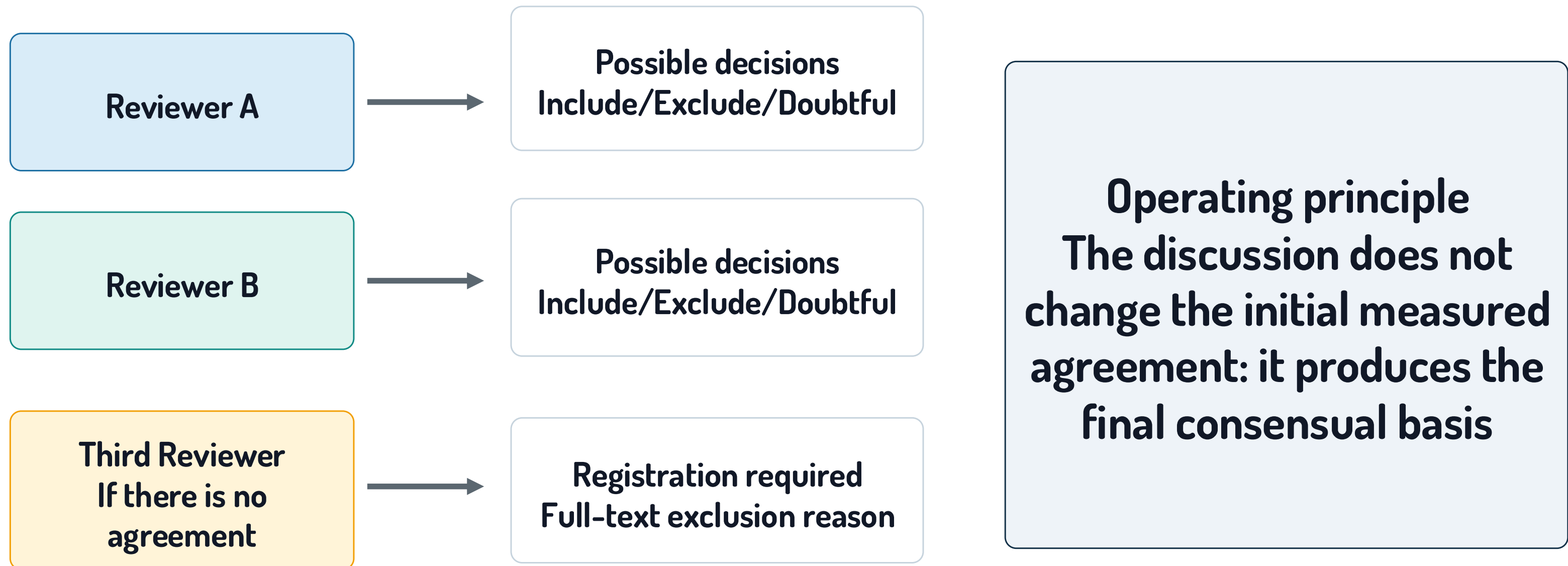
A third review author acts as a mediator in case initial consensus is not reached

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



Image generated with ChatGPT Plus

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	Substantial	Ideal / Recommended for an SLR
0.81 – 1.00	Almost perfect	Excellent

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 κ along with the contingency matrix, agreement percentage, and dispute resolution procedure

Case study

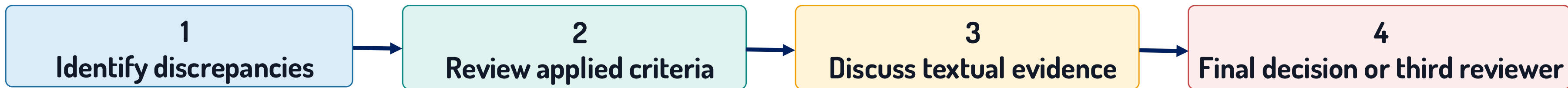
Model writing for the methods section of an article

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	Full source reference	Source metadata (author, title, etc.)
2	Summary	It must include the object of study, methodology and main results obtained. Recommended length over 300 words
3	Type of research / Data collection methods	Type of research (qualitative, quantitative, theoretical, applied, case study, etc.) and methods of data collection
4	Main contributions	In relation to: terminology, models, concepts, experimental design, results, etc.
5	Value, originality or more relevant aspects	The aspects that give the greatest value to the work are identified: rigor, writing, data, etc.
6	Comments and evaluation synthesis	Additional notes and comments of an evaluative or critical nature
7	Keywords	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/169RCtU7Q4Qqleryq1d6c1XnMzDEhgyptYqZh1C8eaYA/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.

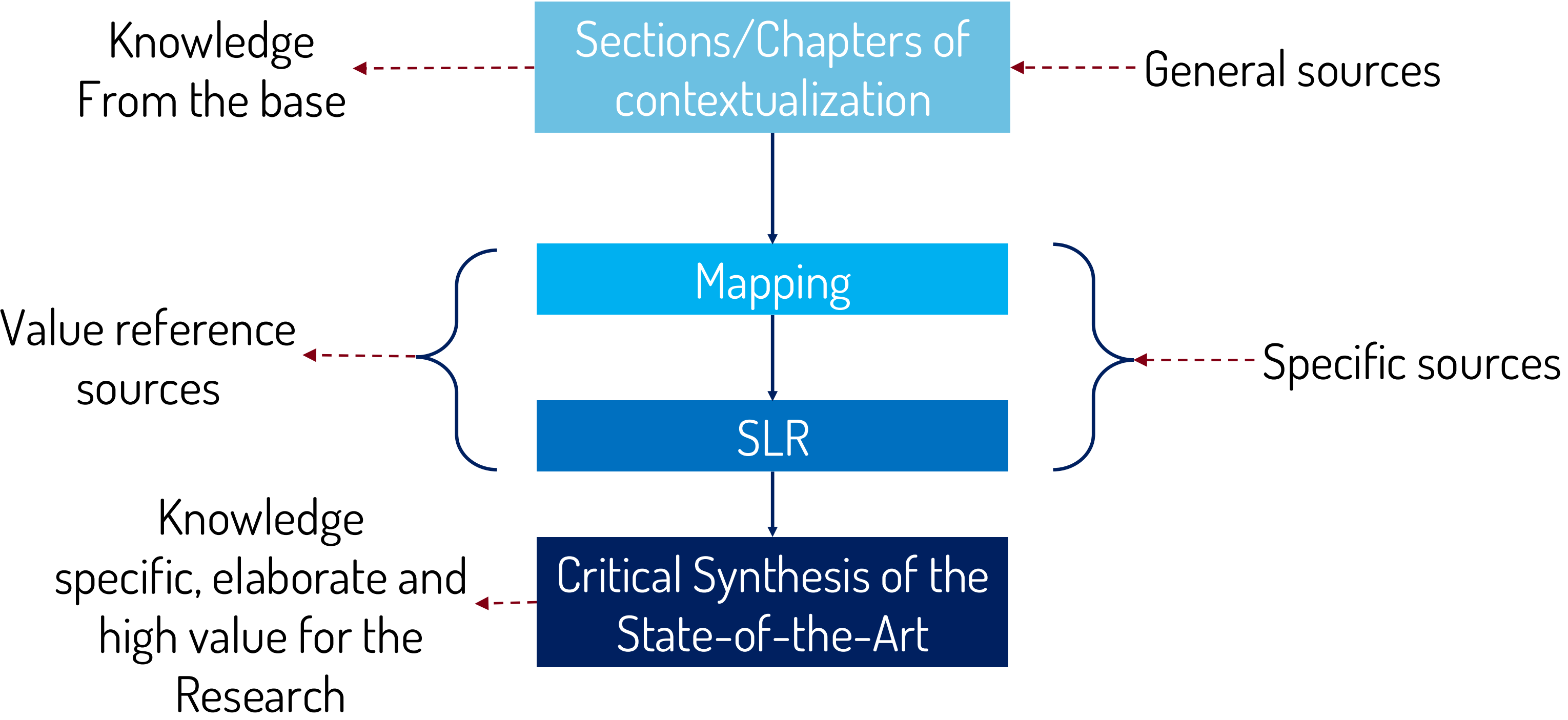
Write the review report

- 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

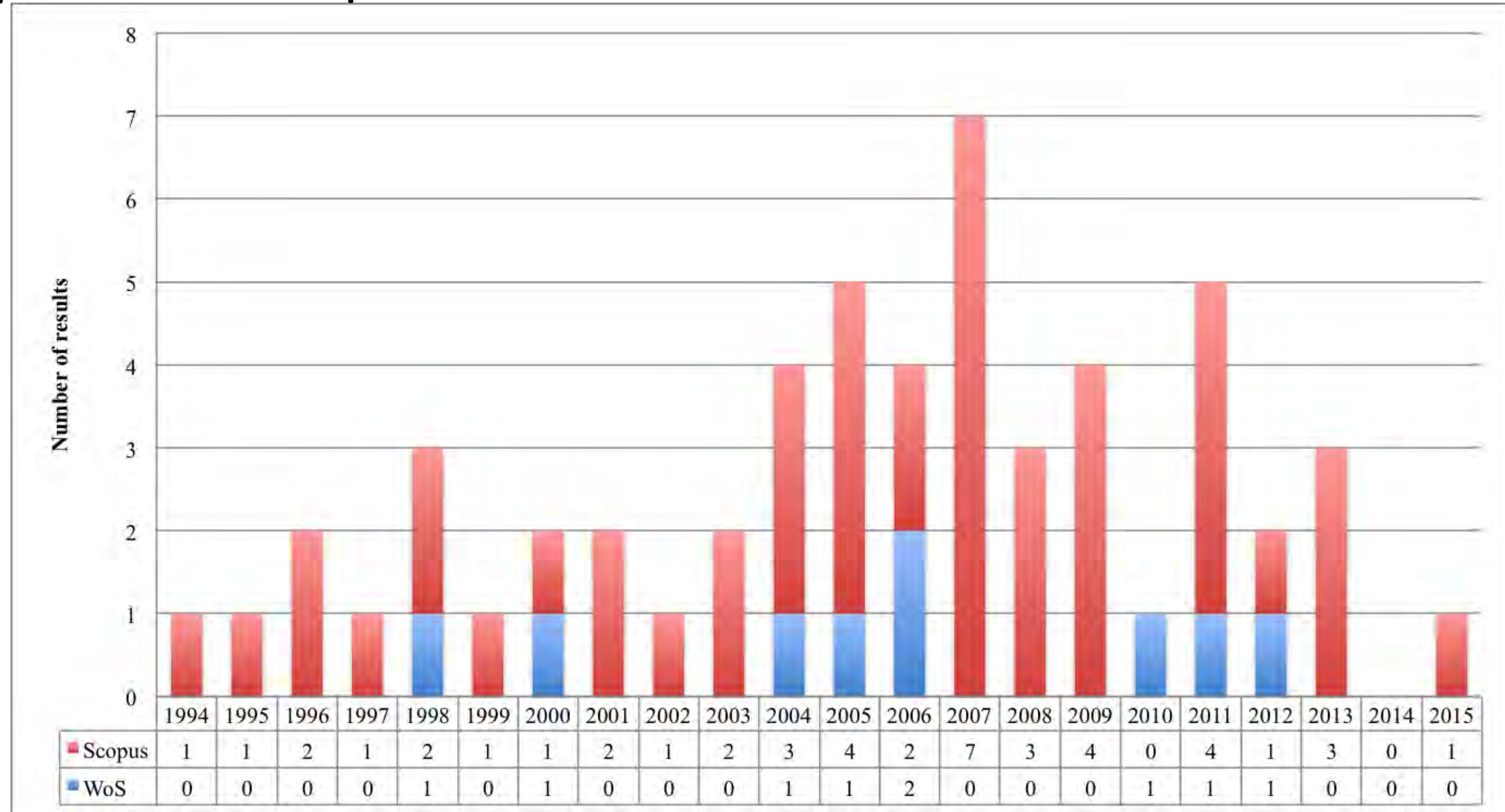
Structure of the State-of-the-Art section in an academic work



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.

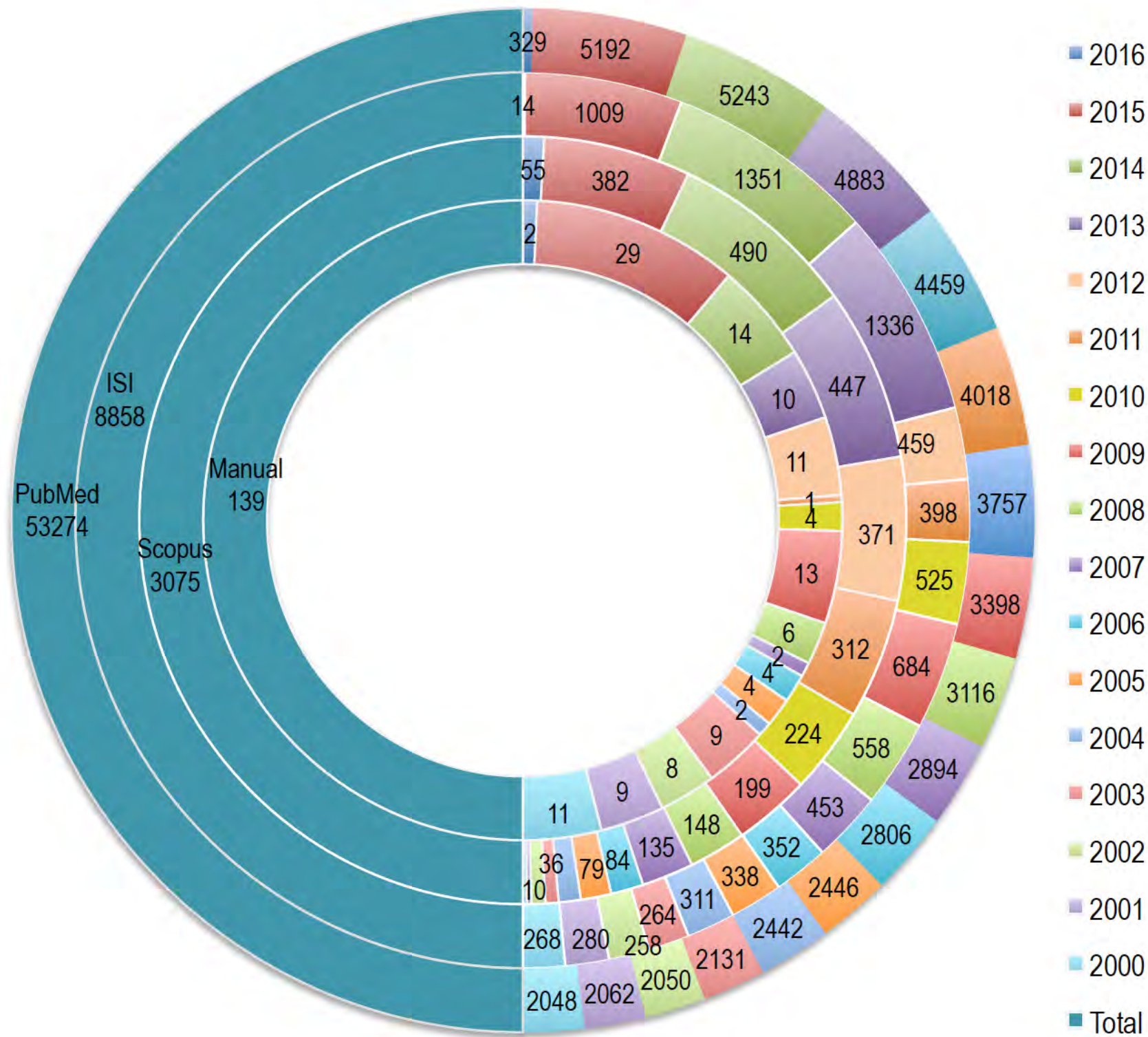
Graphics. Example [65]



Graphics. Example [86]



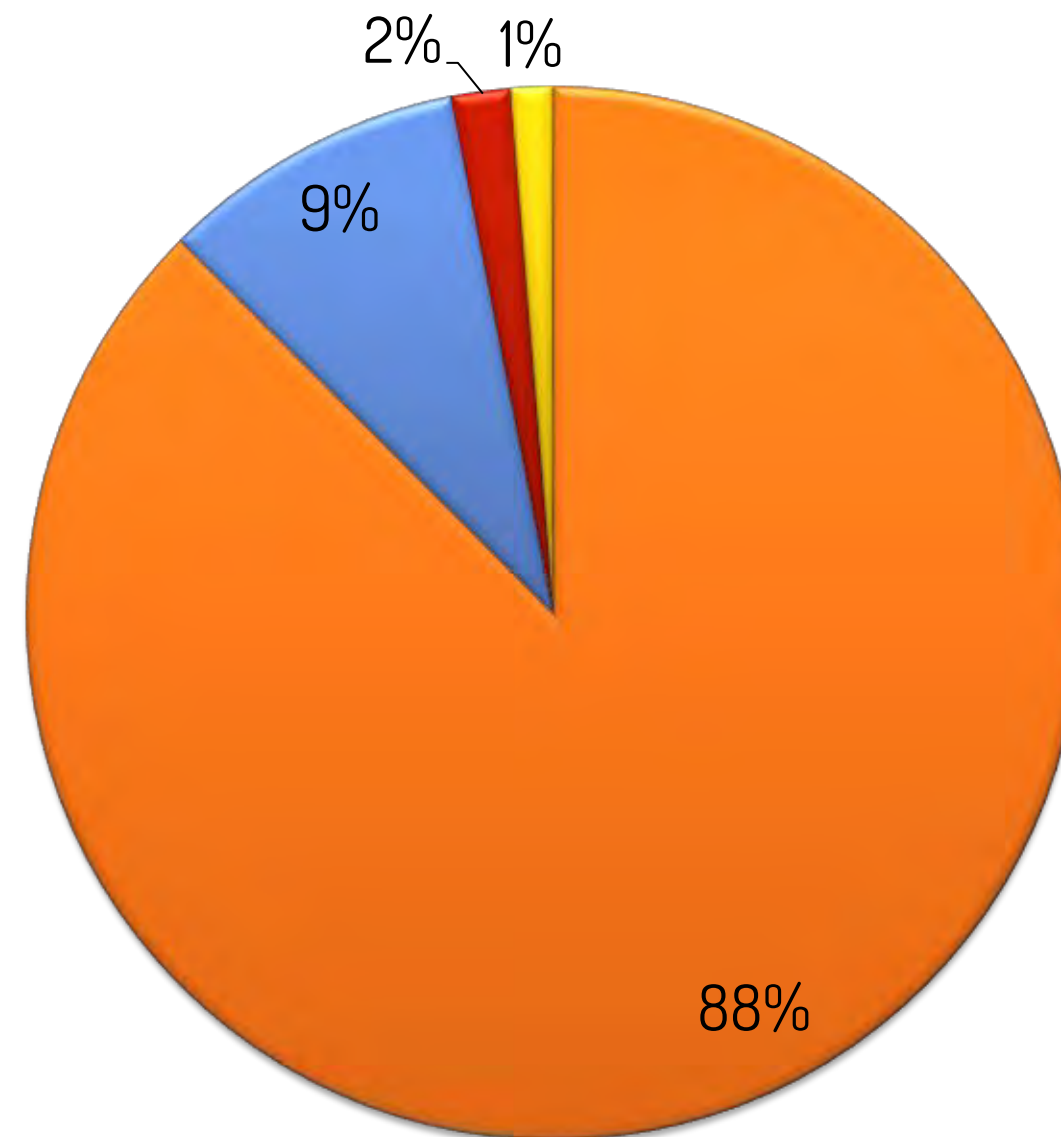
Complete result in
database extraction



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

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

ID	Ref.	Item1	Item2	Item3	Item4	Item5	Item6
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

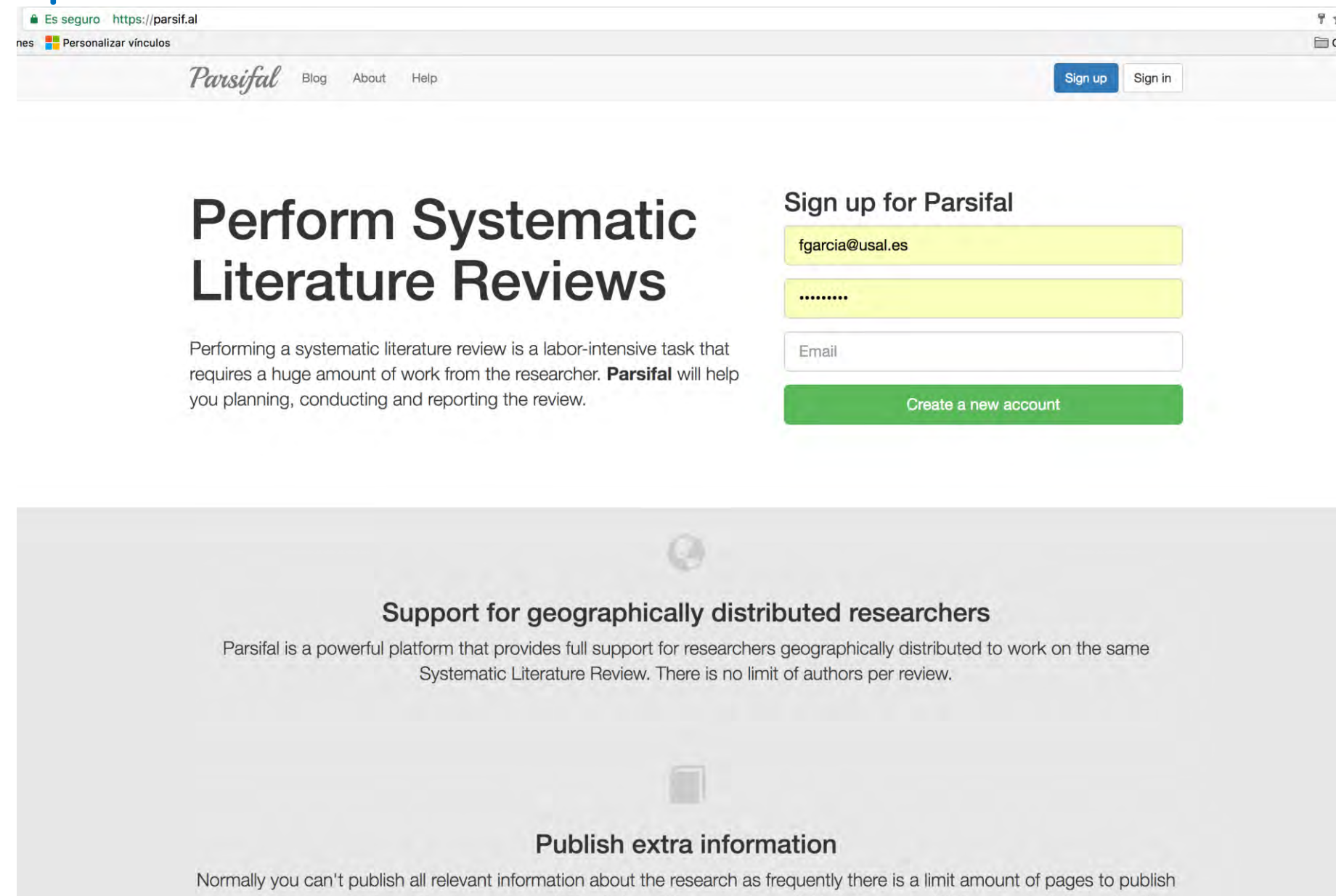
- The Research and Innovation in Education Group of Tecnológico de Monterrey (<http://sitios.itesm.mx/ehe/iie/>) wishes to study the trends in its line of research in the development and use of technology in education
- The development of this case study resulted in the publication of this book [92]

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 is divided into two columns. The left column is titled "Perform Systematic Literature Reviews" and contains a paragraph explaining that performing a systematic literature review is a labor-intensive task that requires a huge amount of work from the researcher, and that Parsifal will help with planning, conducting, and reporting the review. The right column is titled "Sign up for Parsifal" and contains a form with three input fields: a text field for the email address (fgarcia@usal.es), a password field (masked with dots), and an email field. Below the input fields is a green button labeled "Create a new account".

Perform Systematic Literature Reviews

Performing a systematic literature review is a labor-intensive task that requires a huge amount of work from the researcher. **Parsifal** will help you planning, conducting and reporting the review.

Sign up for Parsifal

fgarcia@usal.es

.....

Email

Create a new account

Support for geographically distributed researchers

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.

Publish extra information

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

BlogAboutHelp

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

lauricela25

✗

cangeles

✗

+ Add author

Definition of the protocol

- The objective is defined of the action and the PICOC

Parsifal Blog About Help fgarcia04  

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[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

?

Which is the geographical distribution of the authors?

edit

remove

Which are the most important authors?

edit

remove

Which is the topics list in this research line?

edit

remove

Which are the affected educational levels?

edit

remove

How the discovered topics list is mapped with the current descriptors of the research line?

edit

remove

+ Add Question

Definition of the protocol

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

Keywords and Synonyms ?		
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 edit remove
Development		Intervention edit remove
Educational technol*		Population edit remove
Experience		Intervention edit remove
Impact		Intervention edit remove
Innovat*		Population edit remove
Learning techno*		Population edit remove
Use		Intervention edit remove
+ Add Keyword Import PICO Keywod		

Definition of the protocol

- The question arises as to what the canonical search equation

Search String

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	http://www.isiknowledge.com	 edit	 remove
Scopus	http://www.scopus.com	 edit	 remove
 Add Source  Add a Digital Library			

Definition of the protocol

- Inclusion and exclusion criteria are defined

Selection Criteria

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

Inclusion Criteria

Journal paper

Paper in Spanish or English

The paper has been peer reviewed

The paper presents an experience or study with tested results

Exclusion Criteria

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

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	3.0	Calculated based on the number of questions and on the answer of greater weight
Cutoff Score	0.0	save

Definition of the protocol

- A form for data extraction is defined

Parsifal
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⚙️
🔗

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Review settings

Review
Planning
Conducting
Reporting

Protocol
Quality Assessment Checklist
Data Extraction Form

Data Extraction Form

	Description	Type	Values	
⌵	Authors	String Field	n/a	edit remove
⌵	Journal	String Field	n/a	edit remove
⌵	Year	Integer Field	n/a	edit remove
⌵	DOI	String Field	n/a	edit remove

+ 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

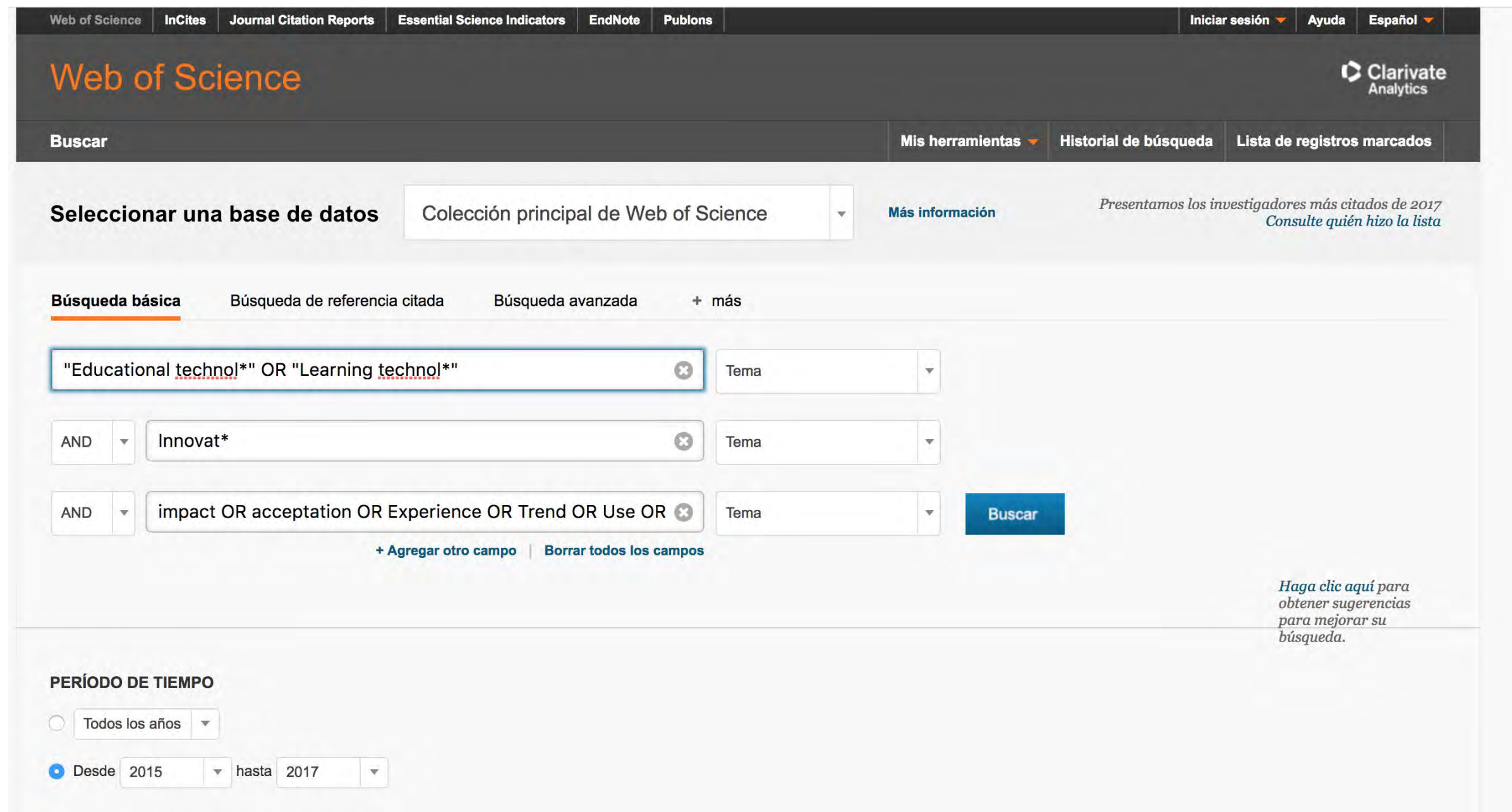
Scopus

```
((("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 is a navigation bar with links to 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'. Below this, the 'Web of Science' logo is displayed on the left, and the 'Clarivate Analytics' logo is on the right. A 'Buscar' button is located on the left, and 'Mis herramientas', 'Historial de búsqueda', and 'Lista de registros marcados' are on the right.

Below the navigation bar, there is a section for 'Seleccionar una base de datos' with a dropdown menu showing 'Colección principal de Web of Science'. To the right of this dropdown is a link for 'Más información' and a promotional message: 'Presentamos los investigadores más citados de 2017. Consulte quién hizo la lista'.

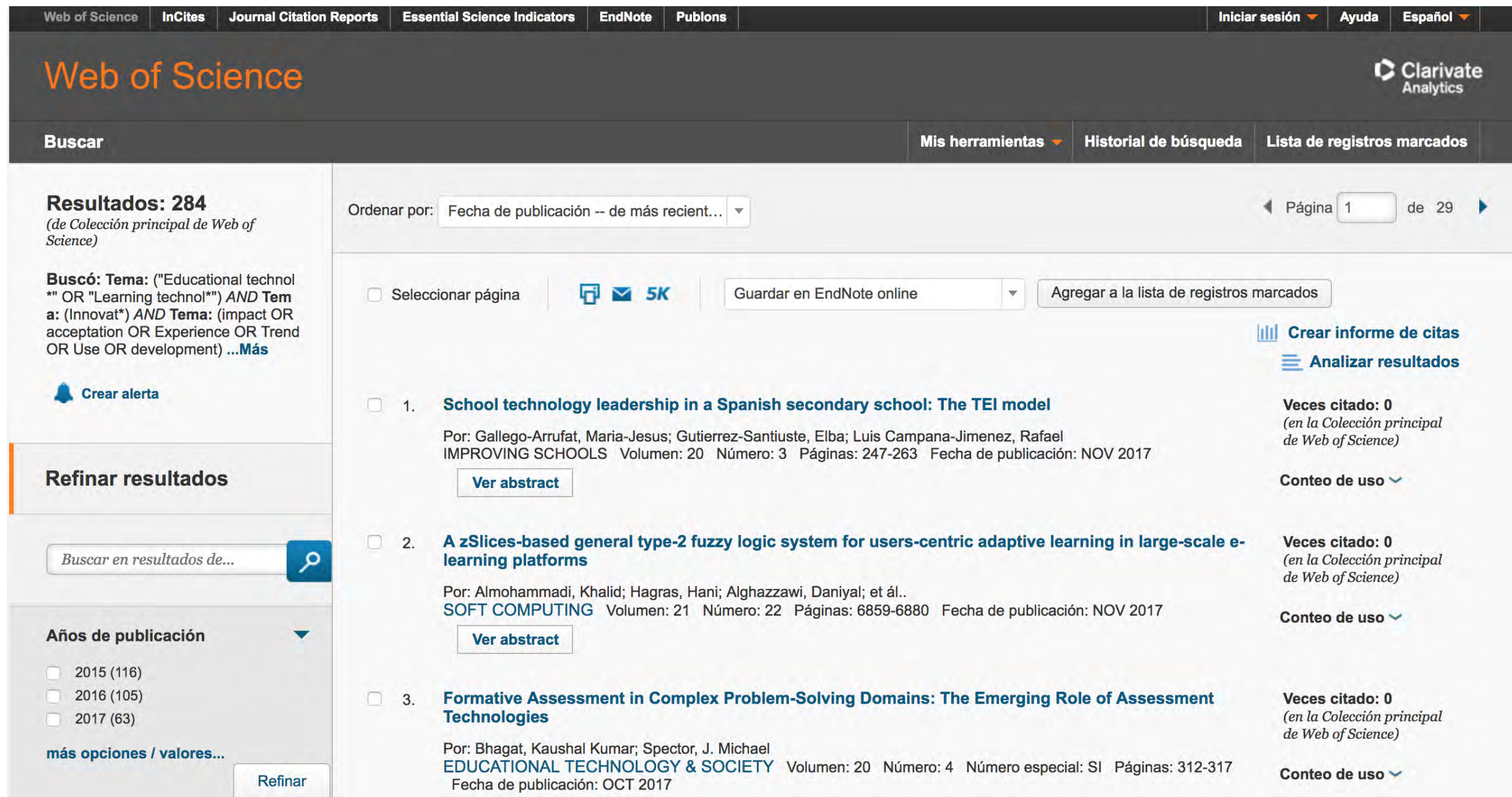
The main search area is titled 'Búsqueda básica' and includes tabs for 'Búsqueda de referencia citada' and 'Búsqueda avanzada'. The search query is entered in a text box: '"Educational technol*" OR "Learning technol*"'. Below this, there are three rows of search criteria, each with a dropdown menu for 'AND' and a text box for the search term. The first row has 'AND' and 'Innovat*'. The second row has 'AND' and 'impact OR acceptance OR Experience OR Trend OR Use OR'. The third row has 'AND' and a text box. To the right of each row is a dropdown menu for 'Tema'. A 'Buscar' button is located to the right of the third row.

Below the search area, there is a section for 'PERÍODO DE TIEMPO' (Time Period). It includes a radio button for 'Todos los años' and a radio button for 'Desde' (From) with a dropdown menu for '2015' and a dropdown menu for 'hasta' (until) with a dropdown menu for '2017'.

At the bottom right, there is a link: 'Haga clic aquí para obtener sugerencias para mejorar su búsqueda.'

Review process

- WoS search is performed



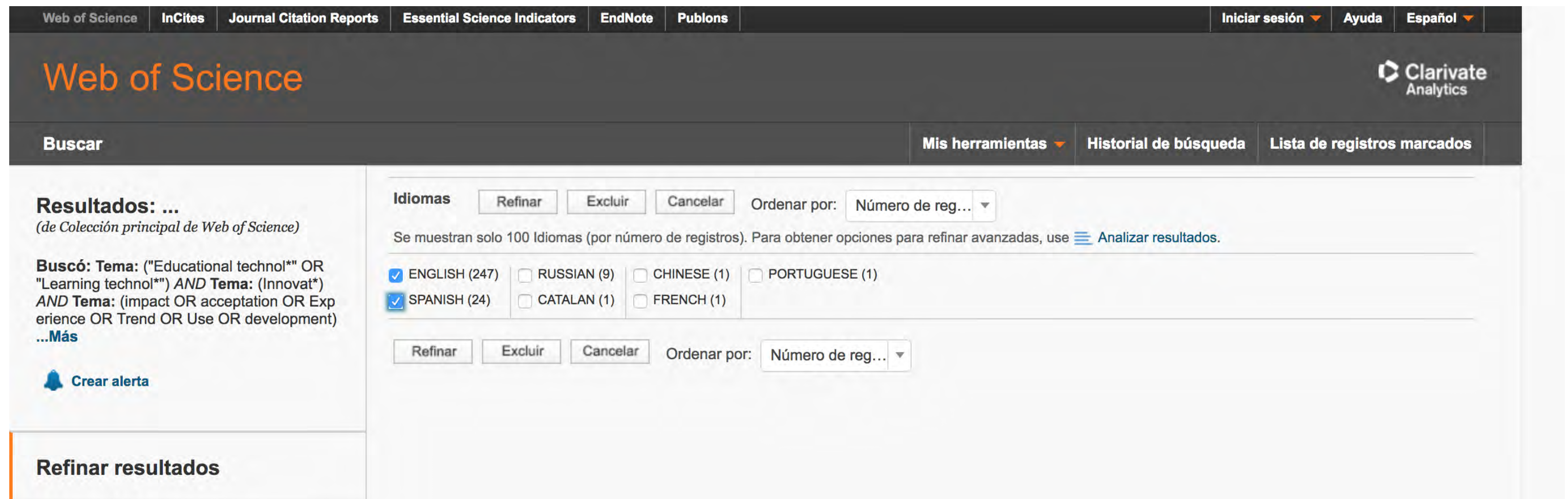
The screenshot shows the Web of Science search results page. The top navigation bar includes links for Web of Science, InCites, Journal Citation Reports, Essential Science Indicators, EndNote, and Publons. The main header displays the Web of Science logo and the Clarivate Analytics logo. The search results are for a query: "Educational technol*" OR "Learning technol*" AND Tema: (Innovat*) AND Tema: (impact OR acceptance OR Experience OR Trend OR Use OR development). The results are sorted by "Fecha de publicación -- de más recent..." and show 284 results. The first three results are listed:

- School technology leadership in a Spanish secondary school: The TEI model**
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
- A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms**
Por: Almohammadi, Khalid; Hagrass, Hani; Alghazzawi, Daniyal; et ál..
SOFT COMPUTING Volumen: 21 Número: 22 Páginas: 6859-6880 Fecha de publicación: NOV 2017
- Formative Assessment in Complex Problem-Solving Domains: The Emerging Role of Assessment Technologies**
Por: Bhagat, Kaushal Kumar; Spector, J. Michael
EDUCATIONAL TECHNOLOGY & SOCIETY Volumen: 20 Número: 4 Número especial: SI Páginas: 312-317 Fecha de publicación: OCT 2017

The page also includes a sidebar with "Refinar resultados" (Refine results) and a search bar for "Buscar en resultados de...". The sidebar shows filters for "Años de publicación" (Years of publication) with options for 2015 (116), 2016 (105), and 2017 (63). The main content area includes a "Ver abstract" button for each result and a "Conteo de uso" (Usage count) section for each result.

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 the Web of Science interface. At the top, there is a navigation bar with links to 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'. Below this, the 'Web of Science' logo is prominently displayed on the left, and the 'Clarivate Analytics' logo is on the right. A search bar labeled 'Buscar' is located below the logo. To the right of the search bar are links for 'Mis herramientas', 'Historial de búsqueda', and 'Lista de registros marcados'.

The main content area shows search results. On the left, under 'Resultados: ...', it indicates '(de Colección principal de Web of Science)'. Below this, the search criteria are listed: 'Buscó: Tema: ("Educational technol*" OR "Learning technol*") AND Tema: (Innovat*) AND Tema: (impact OR acceptance OR Experience OR Trend OR Use OR development) ...Más'. A 'Crear alerta' button is also visible.

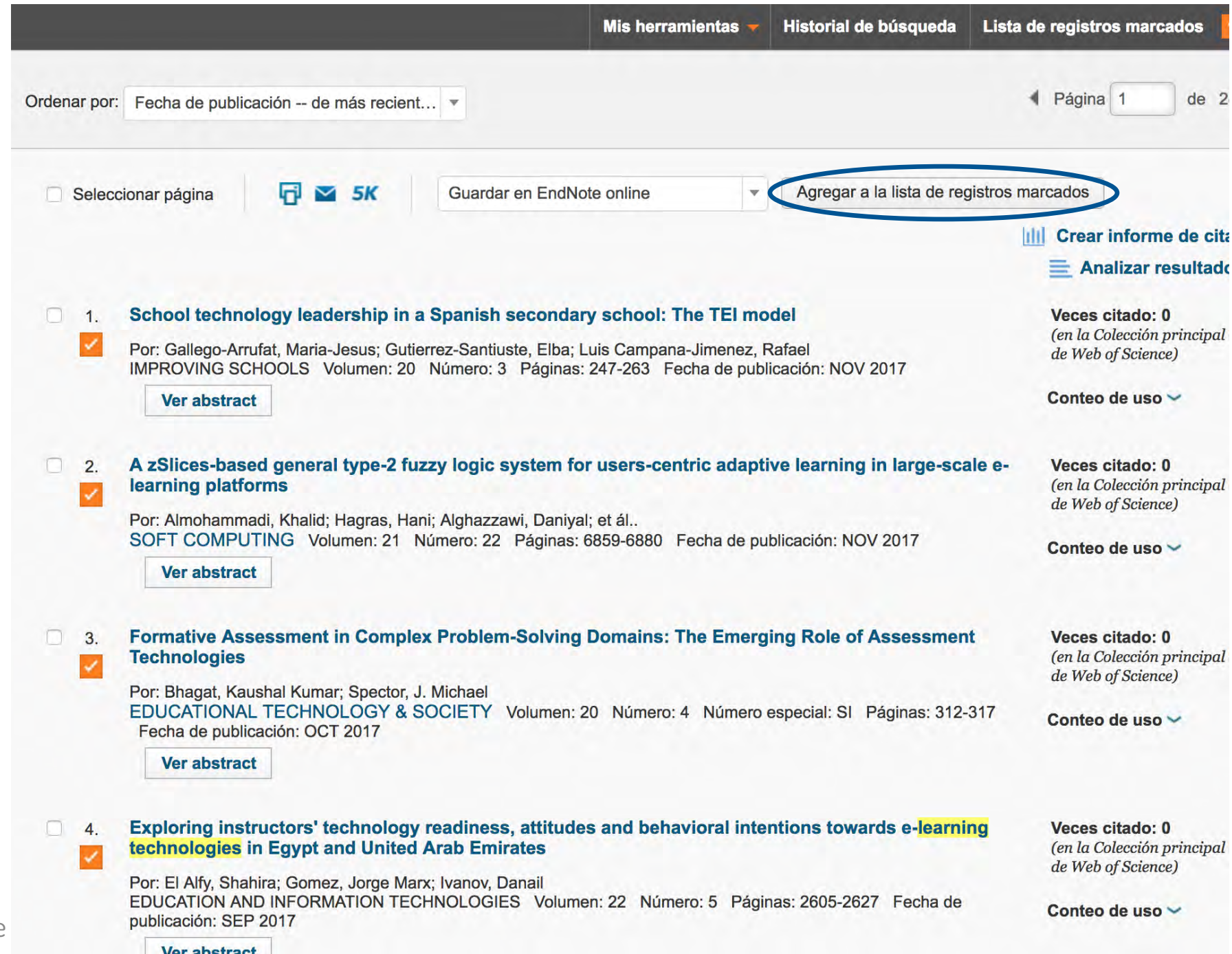
On the right, there is a section for refining results. It includes a table of languages with checkboxes and counts:

Idiomas	Refinar	Excluir	Cancelar	Ordenar por:	Número de reg...
☒ ENGLISH (247)	☐ RUSSIAN (9)	☐ CHINESE (1)	☐ PORTUGUESE (1)		
☒ SPANISH (24)	☐ CATALAN (1)	☐ FRENCH (1)			

Below the table, there are buttons for 'Refinar', 'Excluir', and 'Cancelar', and a dropdown menu for 'Ordenar por: Número de reg...'. A note states: 'Se muestran solo 100 Idiomas (por número de registros). Para obtener opciones para refinar avanzadas, use [Analizar resultados](#)'.

Review process

- Once you have the dataset, you select the records



The screenshot shows a web interface for managing a dataset of research records. At the top, there are navigation tabs: 'Mis herramientas', 'Historial de búsqueda', and 'Lista de registros marcados'. Below these, a sorting dropdown is set to 'Fecha de publicación -- de más recient...'. On the right, it indicates 'Página 1 de 2'. A toolbar contains options like 'Seleccionar página', '5K', 'Guardar en EndNote online', and a button 'Agregar a la lista de registros marcados' which is circled in blue. The main area displays a list of four records, each with a selection checkbox (all are checked), a title, author information, journal details, and a 'Ver abstract' button. To the right of each record, it shows 'Veces citado: 0' and 'Conteo de uso'.

Selección	Número	Título	Autores	Revista	Volumen	Número	Páginas	Fecha de publicación	Veces citado	Conteo de uso
☒	1.	School technology leadership in a Spanish secondary school: The TEI model	Por: Gallego-Arrufat, Maria-Jesus; Gutierrez-Santiuste, Elba; Luis Campana-Jimenez, Rafael	IMPROVING SCHOOLS	20	3	247-263	NOV 2017	0	▼
☒	2.	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Por: Almohammadi, Khalid; Hagrass, Hani; Alghazzawi, Daniyal; et ál..	SOFT COMPUTING	21	22	6859-6880	NOV 2017	0	▼
☒	3.	Formative Assessment in Complex Problem-Solving Domains: The Emerging Role of Assessment Technologies	Por: Bhagat, Kaushal Kumar; Spector, J. Michael	EDUCATIONAL TECHNOLOGY & SOCIETY	20	4	312-317	OCT 2017	0	▼
☒	4.	Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technologies in Egypt and United Arab Emirates	Por: El Alf, Shahira; Gomez, Jorge Marx; Ivanov, Danail	EDUCATION AND INFORMATION TECHNOLOGIES	22	5	2605-2627	SEP 2017	0	▼

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]

☒ **Guardar en otros formatos de archivo**

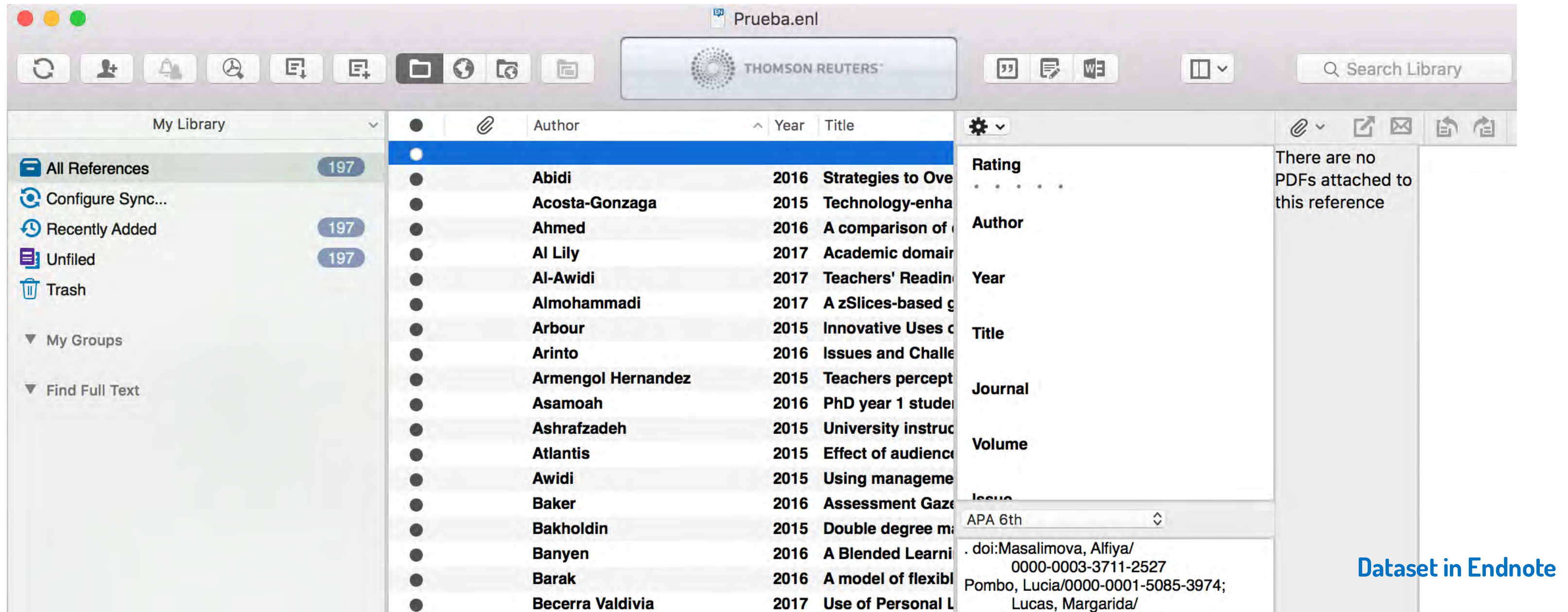
☐ Seleccionar todo | [Restablecer](#)

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

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

Review process

- You already have the dataset to work with



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Search Library

My Library

- All References 197
- Configure Sync...
- Recently Added 197
- Unfiled 197
- Trash
- My Groups
- Find Full Text

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' Reading
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 audience
Awidi	2015	Using manage
Baker	2016	Assessment Gaze
Bakholdin	2015	Double degree m
Banyen	2016	A Blended Learn
Barak	2016	A model of flexibl
Becerra Valdivia	2017	Use of Personal L

Rating
.....

Author

Year

Title

Journal

Volume

Issue

APA 6th

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

There are no PDFs attached to this reference

Dataset in Endnote

Review process

- You already have the dataset to work with

WoS																												
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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 Alf, Shahira; Gomez, Jorge Marx; Ivanov, Danail								Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning techno								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 Disciplin								EURASIA JOURNAL OF MATHEMATICS SCIENCE AND T										
8	J	Wang, Ya-huei; Liao, Hung-Chang								Learning Performance Enhancement Using Computer-Assisted Language Learning by Collaborative Learnin								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 factor								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; Stolloff, 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 BIOLOGIC										
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	Mbat, 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, Xiaoping; 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; Efrén Mora, Carlos; Anorbe-Díaz, Beatriz; Martin-Gutierrez, Jorge/0000-0002-836								Virtual Technologies Trends in Education								EURASIA JOURNAL OF MATHEMATICS SCIENCE AND T										
35	J	Nicolette, Priscila Cadarin; Sommer Bilessimo, Simone Meister; da Silva Cristiano, Marta Adriana; Schardosi								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	Veltrop, Teemu; Saari, Erika; Kukkonen, Jari; Kontkanen, Sini; Lambert, Matthew C.; Makitalo, Sieda; Kot								TRACK updated to measure pre-service teachers' twenty-first century skills								AUSTRALASIAN JOURNAL OF EDUCATIONAL TECHNO										

Review process

- You already have the dataset to work with

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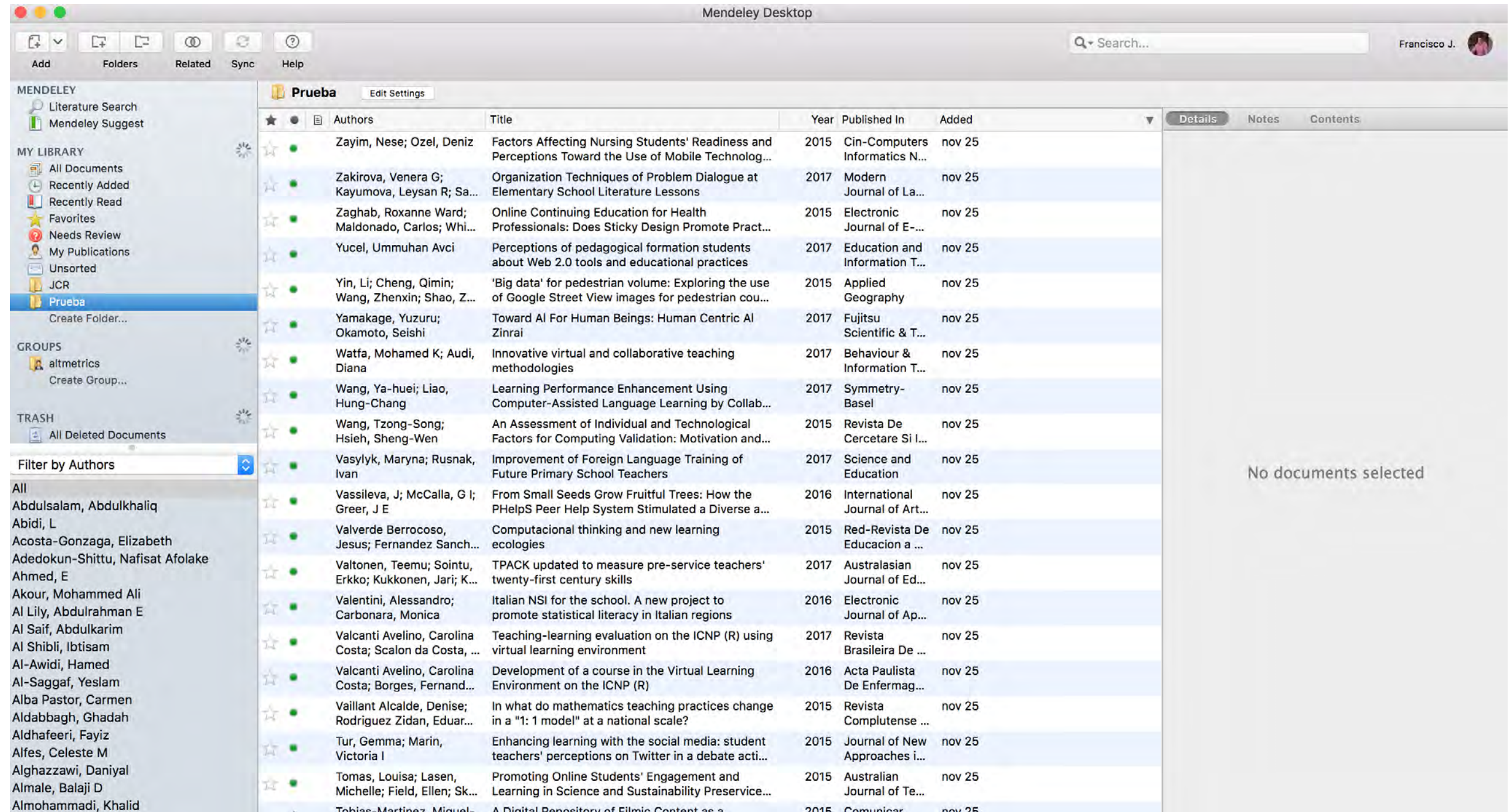
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XML dataset

Review process

- You already have the dataset to work with



Mendeley Desktop

Search...

Francisco J.

MENDELEY

- Literature Search
- Mendeley Suggest

MY LIBRARY

- All Documents
- Recently Added
- Recently Read
- Favorites
- Needs Review
- My Publications
- Unsorted
- JCR
- Prueba**
- Create Folder...

GROUPS

- altmetrics
- Create Group...

TRASH

- All Deleted Documents

Filter by Authors

- All
- Abdulsalam, Abdulkhaliq
- Abidi, L
- Acosta-Gonzaga, Elizabeth
- Adedokun-Shittu, Nafisat Afolake
- Ahmed, E
- Akour, Mohammed Ali
- Al Lily, Abdulrahman E
- Al Saif, Abdulkarim
- Al Shibli, Ibtisam
- Al-Awidi, Hamed
- Al-Saggaf, Yeslam
- Alba Pastor, Carmen
- Aldabbagh, Ghadah
- Aldhafeeri, Fayiz
- Alfes, Celeste M
- Alghazzawi, Daniyal
- Almale, Balaji D
- Almohammadi, Khalid

Prueba Edit Settings

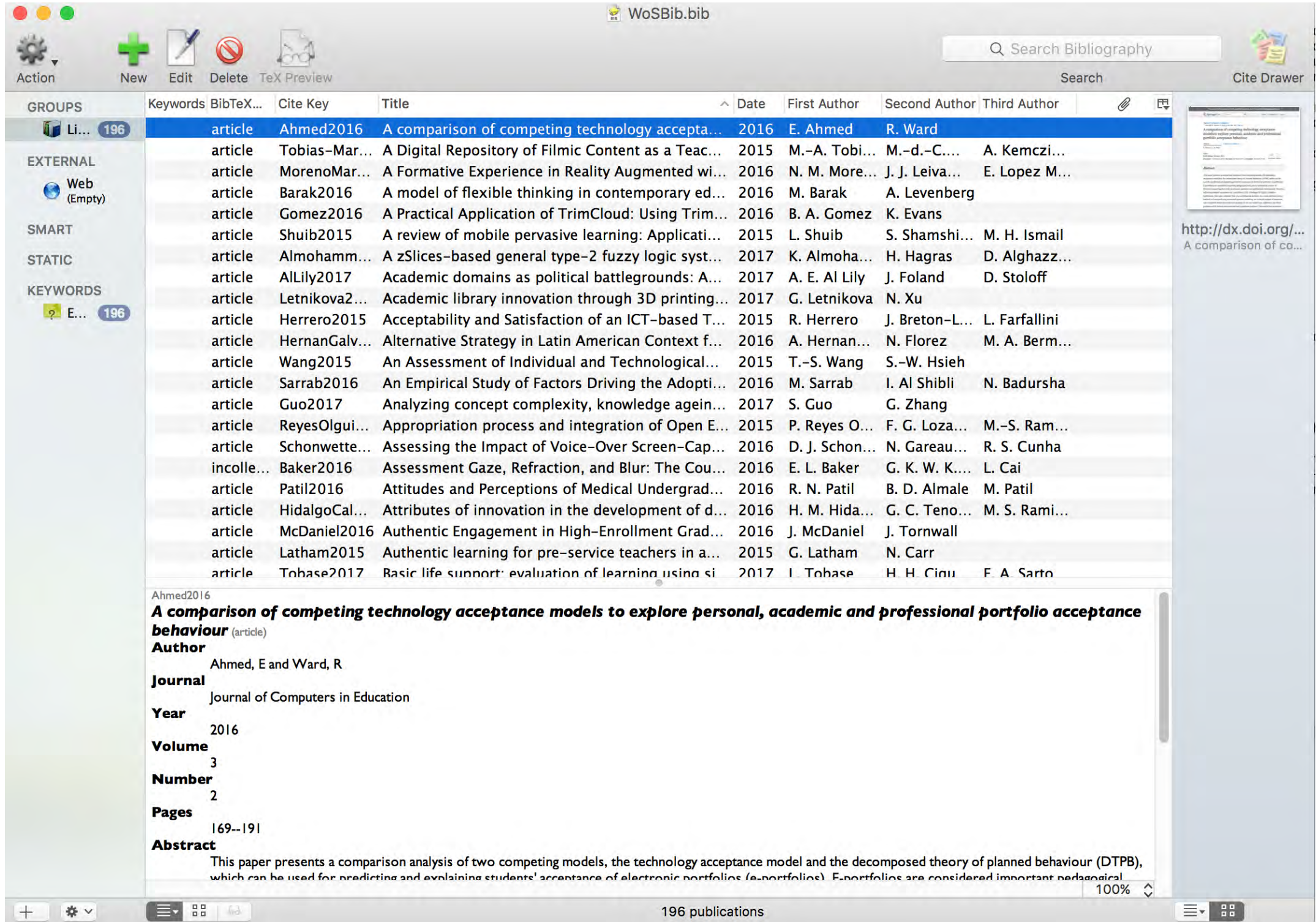
★	●	📄	Authors	Title	Year	Published In	Added	Details	Notes	Contents
★	●	📄	Zayim, Nese; Ozel, Deniz	Factors Affecting Nursing Students' Readiness and Perceptions Toward the Use of Mobile Technolog...	2015	Cin-Computers Informatics N...	nov 25			
★	●	📄	Zakirova, Venera G; Kayumova, Leysan R; Sa...	Organization 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			
★	●	📄	Wafra, 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, Erko; 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			

No documents selected

Dataset in Mendely

Review process

- You already have the dataset to work with



The screenshot shows the WoSbib application window. The top toolbar includes icons for Action, New, Edit, Delete, and TeX Preview. A search bar is located in the top right. The main area displays a table of 196 publications. The first publication is selected, and its details are shown in a sidebar on the right.

GROUPS	Keywords	BibTeX...	Cite Key	Title	Date	First Author	Second Author	Third Author
Li... 196	article	Ahmed2016		A comparison of competing technology acceptance...	2016	E. Ahmed	R. Ward	
EXTERNAL	article	Tobias-Mar...		A Digital Repository of Filmic Content as a Teac...	2015	M.-A. Tob...	M.-d.-C...	A. Kemczi...
Web (Empty)	article	MorenoMar...		A Formative Experience in Reality Augmented wi...	2016	N. M. More...	J. J. Leiva...	E. Lopez M...
SMART	article	Barak2016		A model of flexible thinking in contemporary ed...	2016	M. Barak	A. Levenberg	
STATIC	article	Gomez2016		A Practical Application of TrimCloud: Using Trim...	2016	B. A. Gomez	K. Evans	
KEYWORDS	article	Shuib2015		A review of mobile pervasive learning: Applicati...	2015	L. Shuib	S. Shamshi...	M. H. Ismail
E... 196	article	Almohamm...		A zSlices-based general type-2 fuzzy logic syst...	2017	K. Almoha...	H. Hagras	D. Alghazz...
	article	AlLily2017		Academic domains as political battlegrounds: A...	2017	A. E. Al Lily	J. Foland	D. Stoloff
	article	Letnikova2...		Academic library innovation through 3D printing...	2017	G. Letnikova	N. Xu	
	article	Herrero2015		Acceptability and Satisfaction of an ICT-based T...	2015	R. Herrero	J. Breton-L...	L. Farfallini
	article	HernanGalv...		Alternative Strategy in Latin American Context f...	2016	A. Hernan...	N. Florez	M. A. Berm...
	article	Wang2015		An Assessment of Individual and Technological...	2015	T.-S. Wang	S.-W. Hsieh	
	article	Sarrab2016		An Empirical Study of Factors Driving the Adopti...	2016	M. Sarrab	I. Al Shibli	N. Badursha
	article	Guo2017		Analyzing concept complexity, knowledge agein...	2017	S. Guo	G. Zhang	
	article	ReyesOlgui...		Appropriation process and integration of Open E...	2015	P. Reyes O...	F. G. Loza...	M.-S. Ram...
	article	Schonwette...		Assessing the Impact of Voice-Over Screen-Cap...	2016	D. J. Schon...	N. Gareau...	R. S. Cunha
	incolle...	Baker2016		Assessment Gaze, Refraction, and Blur: The Cou...	2016	E. L. Baker	G. K. W. K...	L. Cai
	article	Patil2016		Attitudes and Perceptions of Medical Undergrad...	2016	R. N. Patil	B. D. Almale	M. Patil
	article	HidalgoCal...		Attributes of innovation in the development of d...	2016	H. M. Hida...	G. C. Teno...	M. S. Rami...
	article	McDaniel2016		Authentic Engagement in High-Enrollment Grad...	2016	J. McDaniel	J. Tornwall	
	article	Latham2015		Authentic learning for pre-service teachers in a...	2015	G. Latham	N. Carr	
	article	Tobase2017		Basic life support: evaluation of learning using si...	2017	I. Tobase	H. H. Ciau	F. A. Sarto

Ahmed2016
A comparison of competing technology acceptance models to explore personal, academic and professional portfolio acceptance behaviour (article)
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

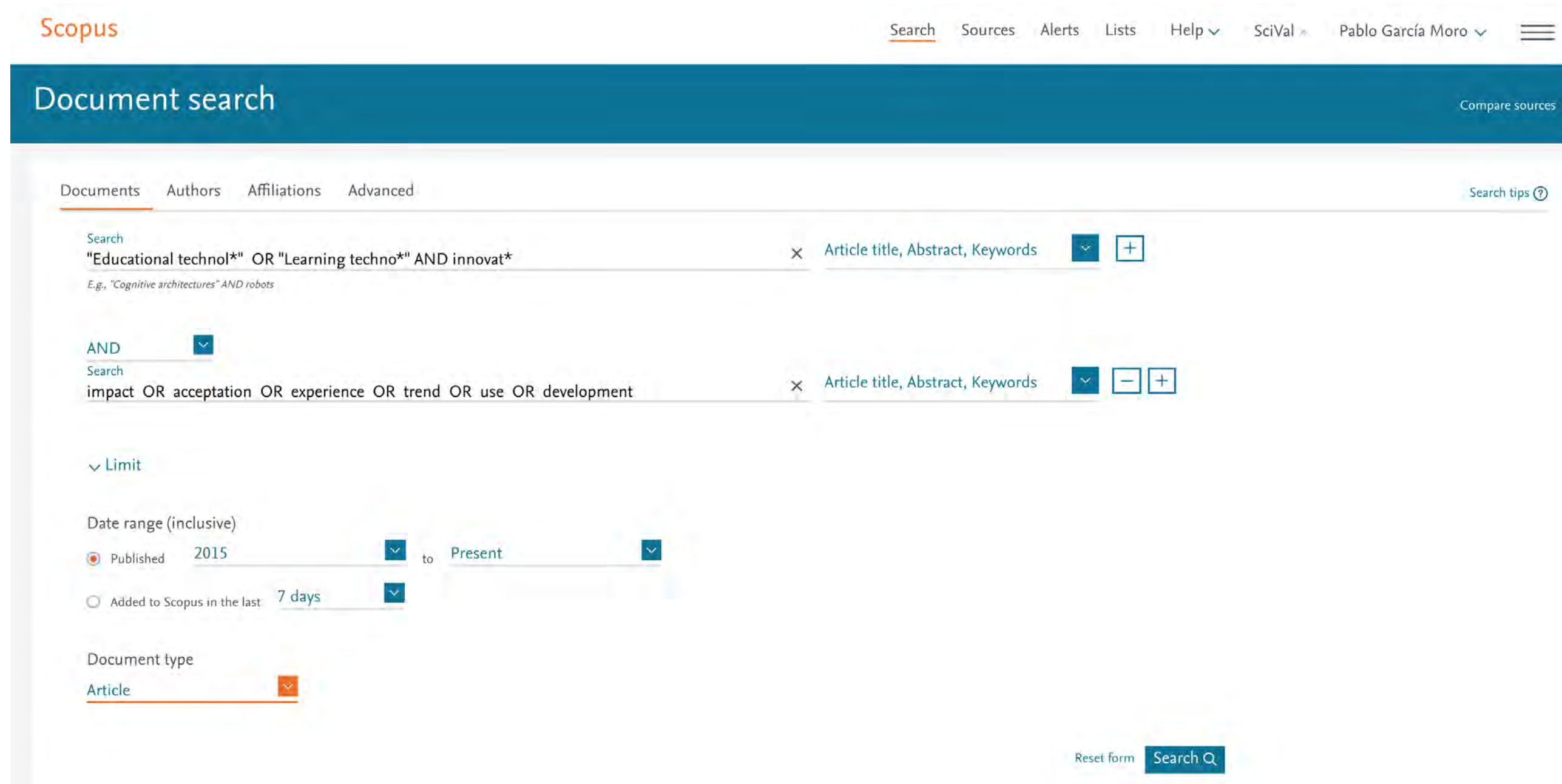
Tema: ("Educational technol*" OR "Learning technol*") AND Tema: ("Innovat*") AND Tema: (impact OR acceptance OR Experience OR Trend OR Use OR development)
 Refinado por: Tipos de documento: (ARTICLE) AND Bases de datos: (WOS) AND Idiomas: (ENGLISH OR SPANISH)
 Período de tiempo: 2015-2017.
 Idioma de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

✓ Save Import Base String Remove ISI Web of Science

+ Add source-specific search string

Review process

- Search is done in Scopus



The screenshot shows the Scopus Document search interface. At the top, the Scopus logo is on the left, and navigation links (Search, Sources, Alerts, Lists, Help, SciVal, Pablo García Moro) are on the right. Below the navigation bar is a blue header with "Document search" and a "Compare sources" link. The main content area has tabs for "Documents", "Authors", "Affiliations", and "Advanced". The "Documents" tab is active. The search bar contains the query: "Educational technol*" OR "Learning techno*" AND innovat*. Below the query, there is a dropdown menu set to "AND" and a search bar containing "impact OR acceptance OR experience OR trend OR use OR development". The "Limit" section shows "Date range (inclusive)" with "Published" selected, "2015" in the start date field, and "Present" in the end date field. The "Document type" section shows "Article" selected. At the bottom right, there are "Reset form" and "Search" buttons.

Review process

- Search is done in Scopus

Scopus

Search Sources Alerts Lists Help ▾ SciVal ▾ Pablo García Moro ▾

331 document results [View secondary documents](#) [View 59 patent results](#)

(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

Edit Save Set alert Set feed

Search within results...

Refine results

Limit to Exclude

Year

☐ 2017 (77) >

☐ 2016 (146) >

☐ 2015 (108) >

Author name

☐ Craig, S.D. (3) >

☐ East, M.L. (3) >

☐ Havard, B. (3) >

☐ Parsaei, H.R. (3) >

☐ Prayaga, L. (3) >

[View more](#)

Subject area

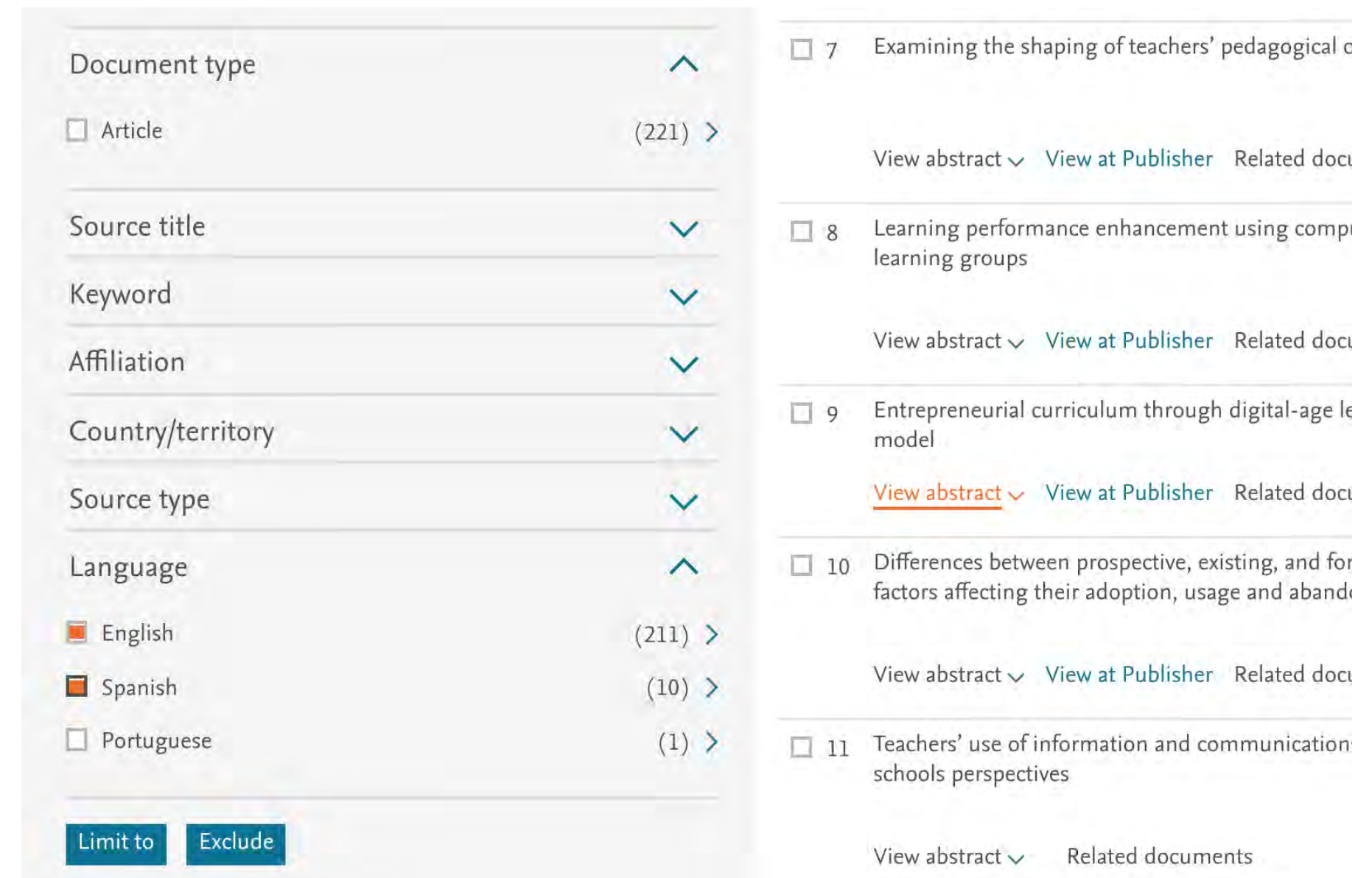
Analyze search results [Show all abstracts](#) Sort on: [Date \(newest\)](#)

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

	Document title	Authors	Year	Source	Cited by
☐ 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
	View abstract ▾ View at Publisher Related documents				
☐ 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
	View abstract ▾ View at Publisher Related documents				
☐ 3	Learning Analytics: at the Nexus of Big Data, Digital Innovation, and Social Justice in Education	Aguilar, S.J.	2017	TechTrends pp. 1-9	0
	View abstract ▾ View at Publisher				
☐ 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				
☐ 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 systematic literature review interface. On the left, a sidebar contains filters for Document type, Source title, Keyword, Affiliation, Country/territory, Source type, and Language. The Language filter is expanded, showing options for English (211), Spanish (10), and Portuguese (1). At the bottom of the sidebar are 'Limit to' and 'Exclude' buttons. On the right, a list of search results is shown, each with a checkbox, a number, and a title. The results are numbered 7 through 11. Each result has links for 'View abstract', 'View at Publisher', and 'Related documents'.

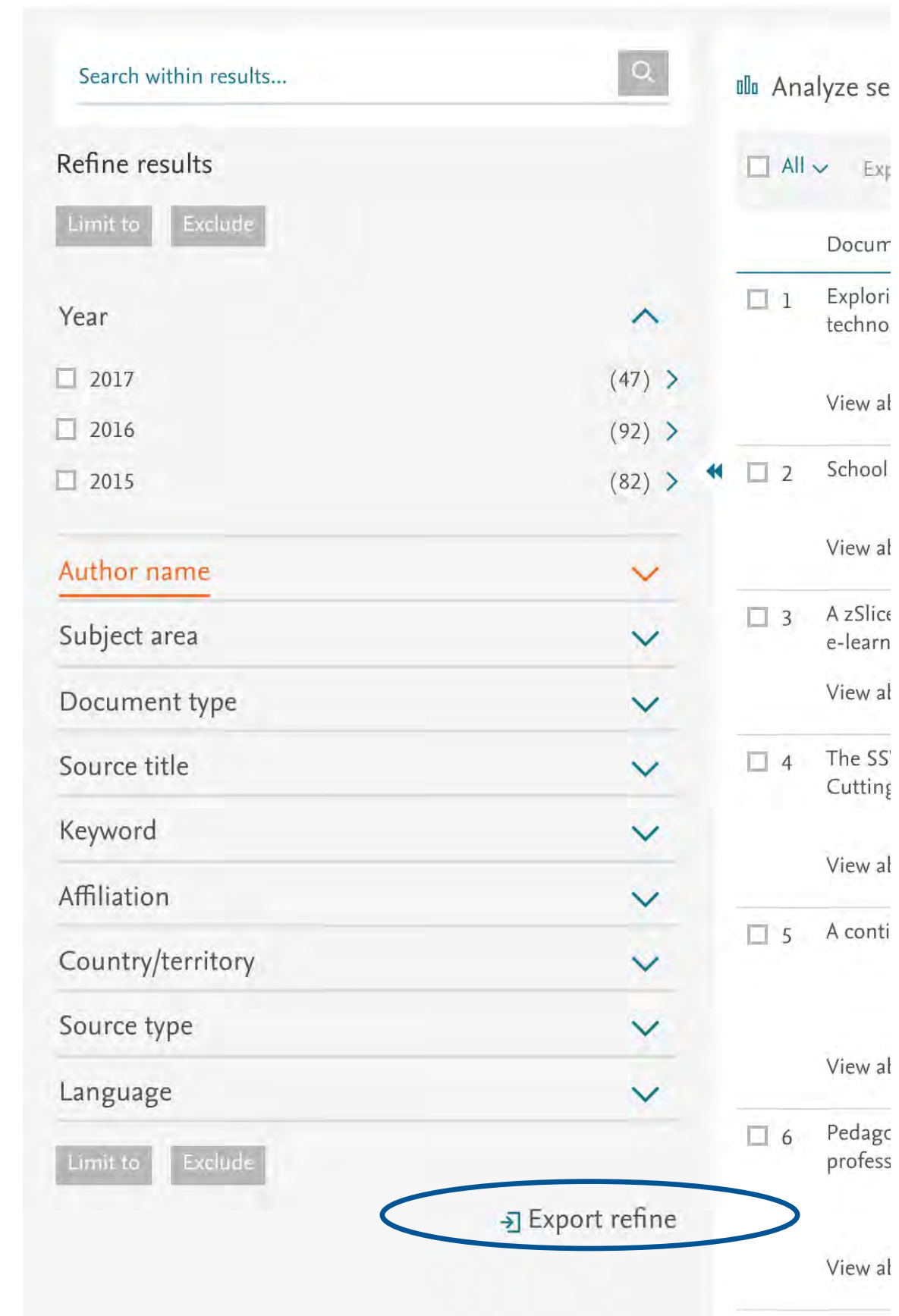
Document type	Source title	Keyword	Affiliation	Country/territory	Source type	Language
☐ Article (221)						☒ English (211) ☒ Spanish (10) ☐ Portuguese (1)

Limit to Exclude

Search Results
☐ 7 Examining the shaping of teachers' pedagogical c View abstract View at Publisher Related docu
☐ 8 Learning performance enhancement using compi 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 results page with a search bar at the top. Below the search bar, there are two buttons: "Limit to" and "Exclude". The main section is titled "Refine results" and lists various filters with their respective counts and a "View all" link for each. The filters are:

- Year: 2017 (47), 2016 (92), 2015 (82)
- Author name
- Subject area
- Document type
- Source title
- Keyword
- Affiliation
- Country/territory
- Source type
- Language

At the bottom of the refinement section, there are two buttons: "Limit to" and "Exclude". To the right of the refinement section, there is a list of documents with checkboxes and titles. The documents are:

- 1 Explori techno
- 2 School
- 3 A zSlice e-learn
- 4 The SS Cutting
- 5 A conti
- 6 Pedagog profess

At the bottom right of the page, there is a button labeled "Export refine" which is circled in blue.

Review process

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

InformacionBusqueda

Inicio Insertar Diseño de página Fórmulas Datos Revisar Ver

Cortar Calibri (Cuerpo) 12 A+ A- = = = = Ajustar texto General Normal Bueno Incorrecto Neutral Cálculo Pégalo Copiar Formato N K S * A Combinar y centrar Formato condicional Dar formato como tabla Insertar Eliminar Formato Autosuma Rellenar Ordenar y filtrar

A60

Scopus refine results values

Your query : ((TITLE-ABS-KEY(("Educational technol*" OR "Learning techno*" AND "Innovat*") AND TITLE-ABS-KEY("Acceptation" OR "Development" OR "Experience" OR "Impact" OR "Use")) AND DOCTYPE(ar) AND PUBYEAR > 2014 AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE, "Spanish")) AND (LIMIT-TO (SRCTYPE, "j")))

Number of results : 219

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	10 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	
	Granić, 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	
	Jalidin, 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 RUON 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 Lviv State University of Physical Culture	2 Brunei Darussalam	3	
	Ahsan Khan, M.	1		International Journal Of Emerging Technologies In Learning	2 Computer-Assisted Instruction	6 University of Southern Queensland	2 Croatia	3	
	Akilek, M.	1		International Review Of Management And Marketing	2 Educational Innovation	6 Sakarya Universitesi	2 Denmark	3	
	Al Lily, A.E.	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		Journal Of Physical Education And Sport	2 Medical Education	6 Aalborg Universitet	2 Hong Kong	3	
	Al Shibli, I.	1		Online Learning Journal	2 Mobile Learning	6 University of New South Wales UNSW Australia	2 Japan	3	
	Al-Saggaf, Y.	1		Revista Complutense De Educacion	2 Motivation	6 University of Malaya	2 Netherlands	3	
	Albaiz, T.	1		Revista De Pedagogia	2 Priority Journal	6 Wuhan University	2 New Zealand	3	
	Altshuler, G.	1		Blackwell Research On Science E Technology And Information	2 Questionnaire	6 Blackstone Business University of Economics	2 Norway	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
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				
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				
3	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K., Hagrass, H., Alghazzawi, D., Aldabbagh, G.	2017	Soft Computing 21(22), pp. 6859-6880	0
	View abstract View at Publisher Related documents				
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				
5	A continuum of teachers' e-learning practices	Sadeck, O., Cronjé, J.	2017	Electronic Journal of e-Learning 15(5), pp. 395-408 Open Access	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

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☒
CSV (Excel)

☐
BibTeX

☐
Text (ASCII in HTML)

What information do you want to export?

Customize export

☒ Citation information

☐ Bibliographical information

☒ Abstract and Keywords

☐ Funding Details

☐ Other information

☒ Author(s)

☒ Document title

☒ Year

☒ EID

☒ Source title

☒ Volume, Issue, Pages

☒ Citation count

☒ Source and Document Type

☒ DOI

☐ Affiliations

☐ Serial identifiers (e.g. ISSN)

☐ PubMed ID

☐ Publisher

☐ Editor(s)

☐ Language of Original Document

☐ Correspondence Address

☐ Abbreviated Source Title

☒ Abstract

☒ Author Keywords

☒ Index Keywords

☐ Number

☐ Acronym

☐ Sponsor

☐ Funding text

☐ Tradenames and Manufacturers

☐ Accession numbers and Chemicals

☐ Conference information

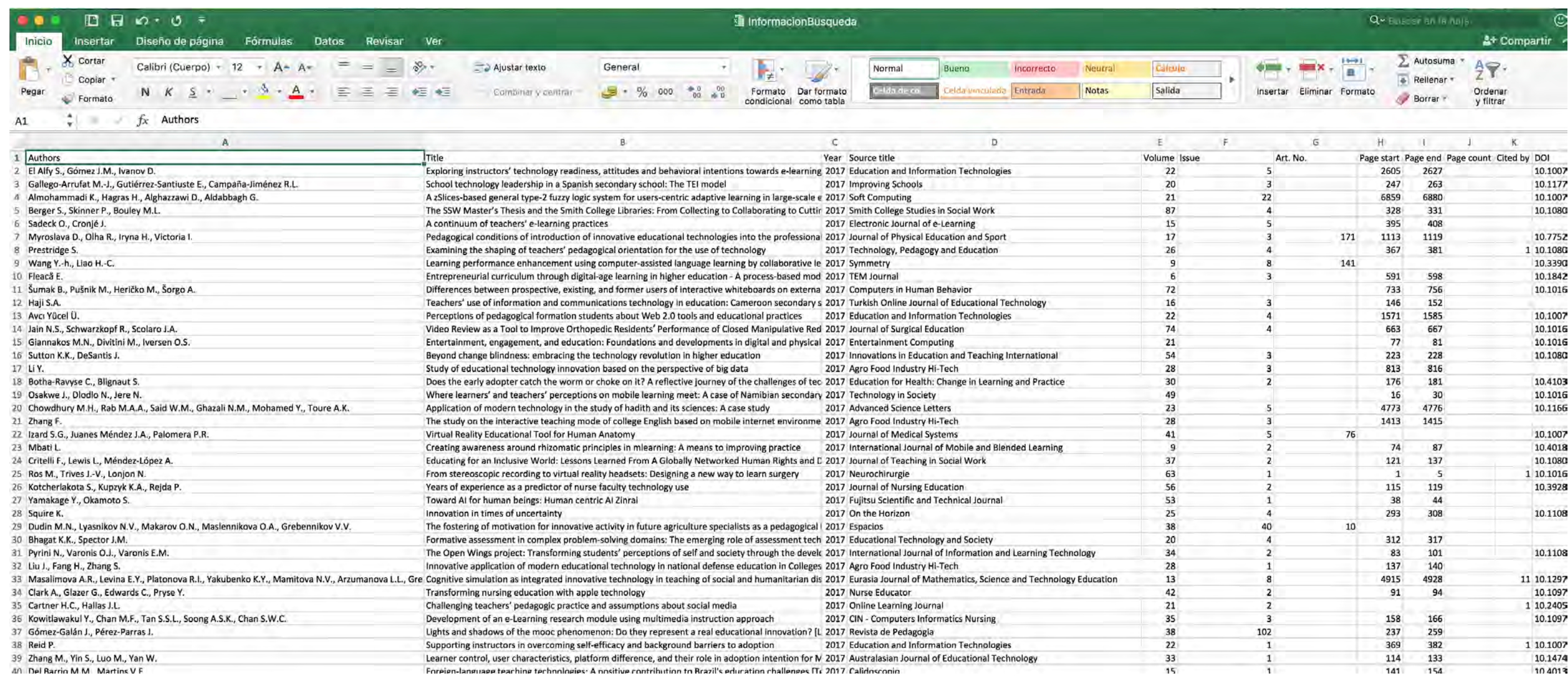
☐ Include references

Cancel

Export

Review process

- You already have the dataset to work with

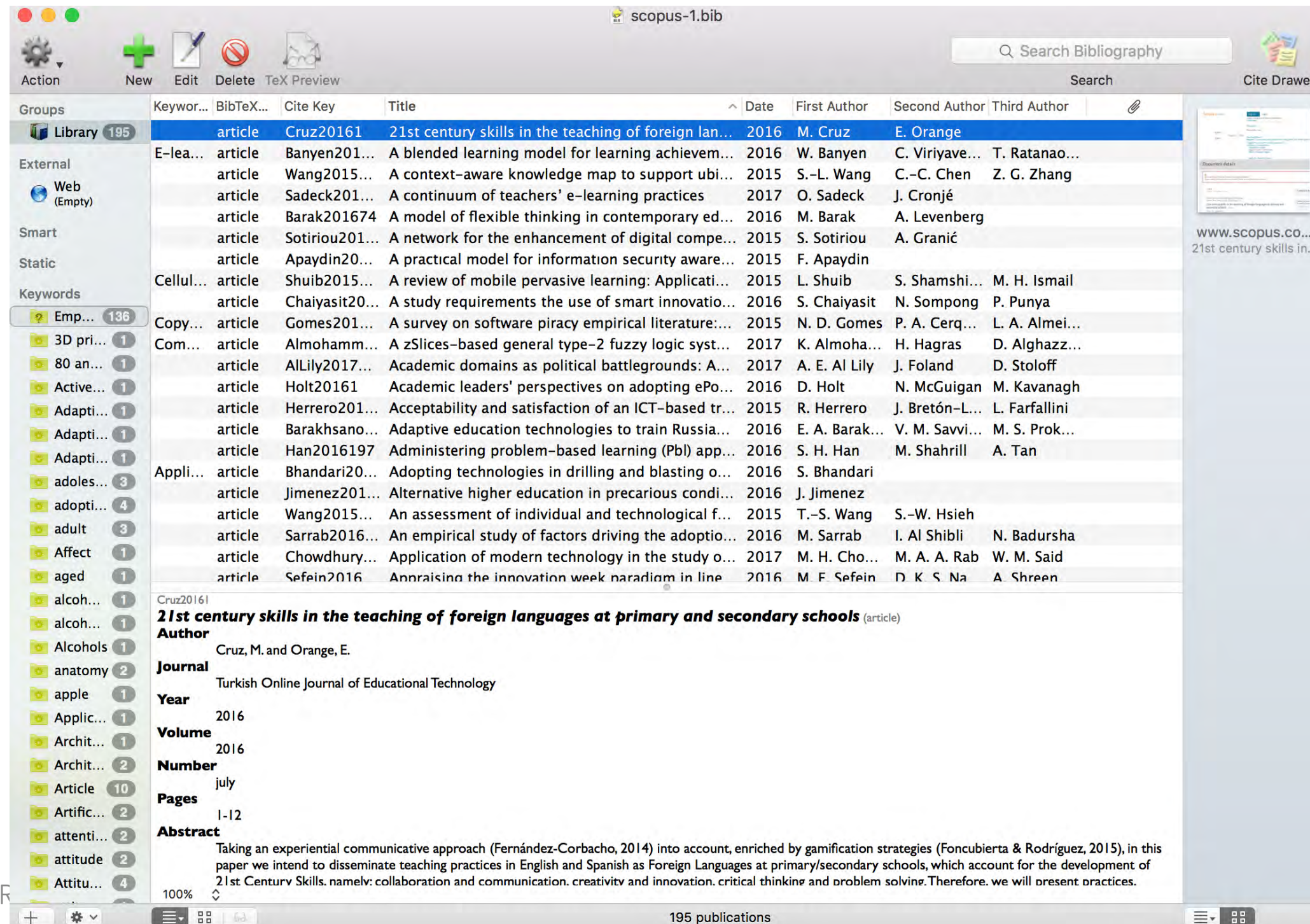


Authors	Title	Year	Source title	Volume	Issue	Art. No.	Page start	Page end	Page count	Cited by	DOI
El Alfí S., Gómez J.M., Ivanov D.	Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning	2017	Education and Information Technologies	22		5	2605	2627			10.1007
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., Hagras 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 professiona	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			
Avcı 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., Blignaut 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., Lyashnikov 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 Barrio M.M., Martins V.F.	Foreign-language teaching technologies: A positive contribution to Brazil's education challenges (T	2017	Calidescopia	15		1	141	154			10.4013

Dataset in CSV

Review process

- You already have the dataset to work with



Groups	Keywor...	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	article	Banyen201...		A blended learning model for learning achievem...	2016	W. Banyen	C. Viriyave...	T. Ratanao...
Web (Empty)	article	Wang2015...		A context-aware knowledge map to support ubi...	2015	S.-L. Wang	C.-C. Chen	Z. G. Zhang
Smart	article	Sadeck201...		A continuum of teachers' e-learning practices	2017	O. Sadeck	J. Cronjé	
Static	article	Barak201674		A model of flexible thinking in contemporary ed...	2016	M. Barak	A. Levenberg	
Keywords	article	Sotiriou201...		A network for the enhancement of digital compe...	2015	S. Sotiriou	A. Granić	
Emp... 136	article	Apaydin20...		A practical model for information security aware...	2015	F. Apaydin		
3D pri... 1	article	Shuib2015...		A review of mobile pervasive learning: Applicati...	2015	L. Shuib	S. Shamshi...	M. H. Ismail
80 an... 1	article	Chaiyasit20...		A study requirements the use of smart innovatio...	2016	S. Chaiyasit	N. Sompong	P. Punya
Active... 1	article	Gomes201...		A survey on software piracy empirical literature:...	2015	N. D. Gomes	P. A. Cerq...	L. A. Almei...
Adapti... 1	article	Almohamm...		A zSlices-based general type-2 fuzzy logic syst...	2017	K. Almoha...	H. Hagra...	D. Alghazz...
Adapti... 1	article	AlLily2017...		Academic domains as political battlegrounds: A...	2017	A. E. Al Lily	J. Foland	D. Stoloff
Adapti... 1	article	Holt20161		Academic leaders' perspectives on adopting ePo...	2016	D. Holt	N. McGuigan	M. Kavanagh
adoles... 3	article	Herrero201...		Acceptability and satisfaction of an ICT-based tr...	2015	R. Herrero	J. Bretón-L...	L. Farfallini
adopti... 4	article	Barakhsano...		Adaptive education technologies to train Russia...	2016	E. A. Barak...	V. M. Savvi...	M. S. Prok...
adult 3	article	Han2016197		Administering problem-based learning (Pbl) app...	2016	S. H. Han	M. Shahrill	A. Tan
Affect 1	article	Bhandari20...		Adopting technologies in drilling and blasting o...	2016	S. Bhandari		
aged 1	article	Jimenez201...		Alternative higher education in precarious condi...	2016	J. Jimenez		
alcoh... 1	article	Wang2015...		An assessment of individual and technological f...	2015	T.-S. Wang	S.-W. Hsieh	
alcoh... 1	article	Sarrab2016...		An empirical study of factors driving the adoptio...	2016	M. Sarrab	I. Al Shibli	N. Badursha
Alcohols 1	article	Chowdhury...		Application of modern technology in the study o...	2017	M. H. Cho...	M. A. A. Rab	W. M. Said
anatomy 2	article	Sefein2016		Anraising the innovation week paradiam in line	2016	M. F. Sefein	D. K. S. Na	A. Shreen
apple 1								
Applic... 1								
Archit... 1								
Archit... 2								
Article 10								
Artific... 2								
attenti... 2								
attitude 2								
Attitu... 4								

Cruz20161
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. creativity and innovation. critical thinking and problem solving. Therefore. we will present practices.

Dataset in BibTeX

Review process

- The search equation is saved in Scopus

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[Review settings](#)

Review

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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

(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

How to Conduct a Systematic Literature Review?

230

Review of the articles

- Studies are imported

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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

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Review Planning **Conducting** Reporting

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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

☐	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
☐	EIAly20172605	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
☐	Almohammadi20176859	A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms	Almohammadi, K. and Hagra, H. and Alghazzawi, D. and Aldabbagh, G.	Soft Computing	2017	fgarcia04	25 Nov 2017 18:28:07	Unclassified
☐	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

☒	Bibtex Key 	Title 	Author 	Journal 	Year 	Added by 	Added at 	Status 
☒	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
☒	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

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Study Selection

All Sources
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Scopus

Find Duplicates
Export Articles

Action: Remove selected
Go
0 of 333 selected

Show:
☒ All
☐ Accepted
☐ Rejected
☐ Unclassified
☐ Duplicated

☐	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
☐	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
☐	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
☐	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
☐	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. Based on 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

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Save

Review of the articles

- Progress is reflected in the dashboard

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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

☐	Bibtex Key	Title	Author	Journal	Year	Added by	Added at	Status
☐	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
☐	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
☐	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

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Review Planning **Conducting** Reporting

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Quality Assessment

Detailed Summary

Show: ☒ All ☐ Done ☐ Pending Order by: Title (a - z) 

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?	Yes	Partial	No
Is the study designed to achieve these aims?	Yes	Partial	No
Have statistical techniques been used to analyze data?	Yes	Partial	No

Data extraction

- The fields of the data extraction form are filled in

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Data Extraction
Export Data

To-do
Done
All

A zSlices-based general type-2 fuzzy logic system for users-centric adaptive learning in large-scale e-learning platforms 3.0
mark as undone

Authors	Khalid Almohammadi; Hani Hagra; Daniyal Alghazzawi; Ghadah Aldabbagh3
Journal	Soft Computing
Year	2017
DOI	10.1007/s00500-016-2236-5

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



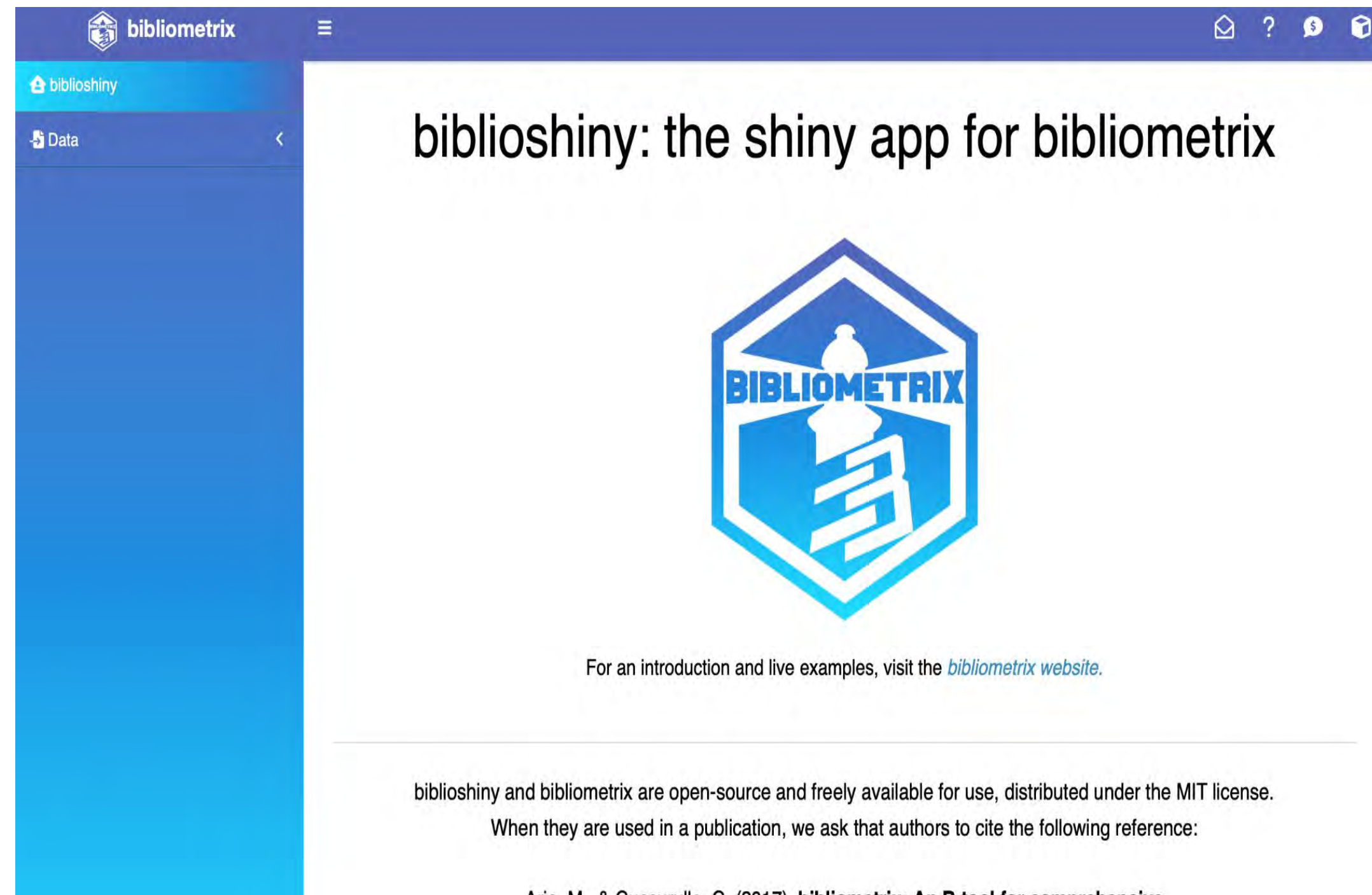
8. Bibliometrix

Bibliometrix

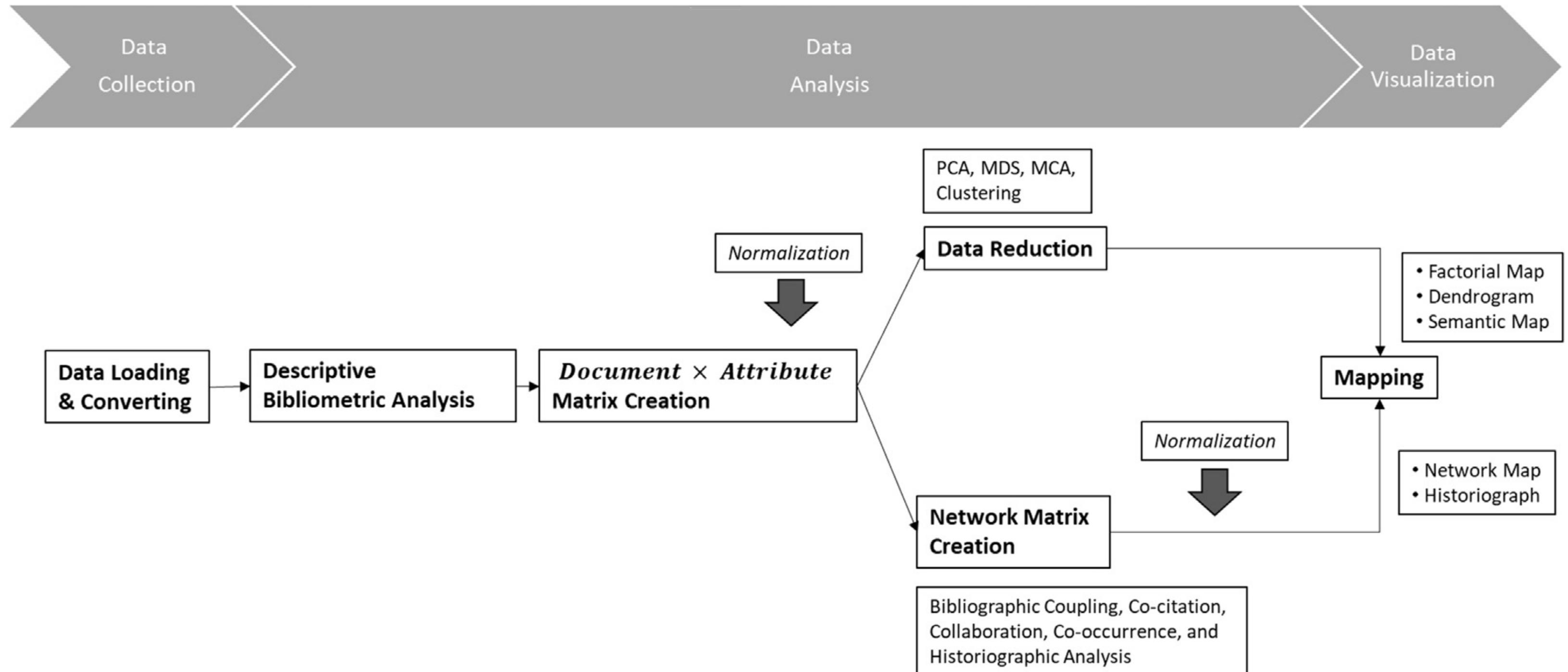
- Bibliometrix (<https://www.bibliometrix.org/home/index.php>) is an open-source tool that allows for an exhaustive analysis of the scientific literature
- It is developed in the R language to be flexible and easy to integrate with other statistical and graphical packages
- As bibliometrics is an ever-changing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



Recommended workflow with Bibliometrix [94]



Installing Bibliometrix



The screenshot shows the Bibliometrix website with a navigation bar at the top containing links: HOME, DOWNLOAD, FEATURES, TUTORIAL, FAQ, BLOG, DONATE, ABOUT US, SUMMER SCHOOL, and LOGIN. The main heading is "Download". Below it, there are two sections: "Stable Version" and "Beta Version".

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) 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.

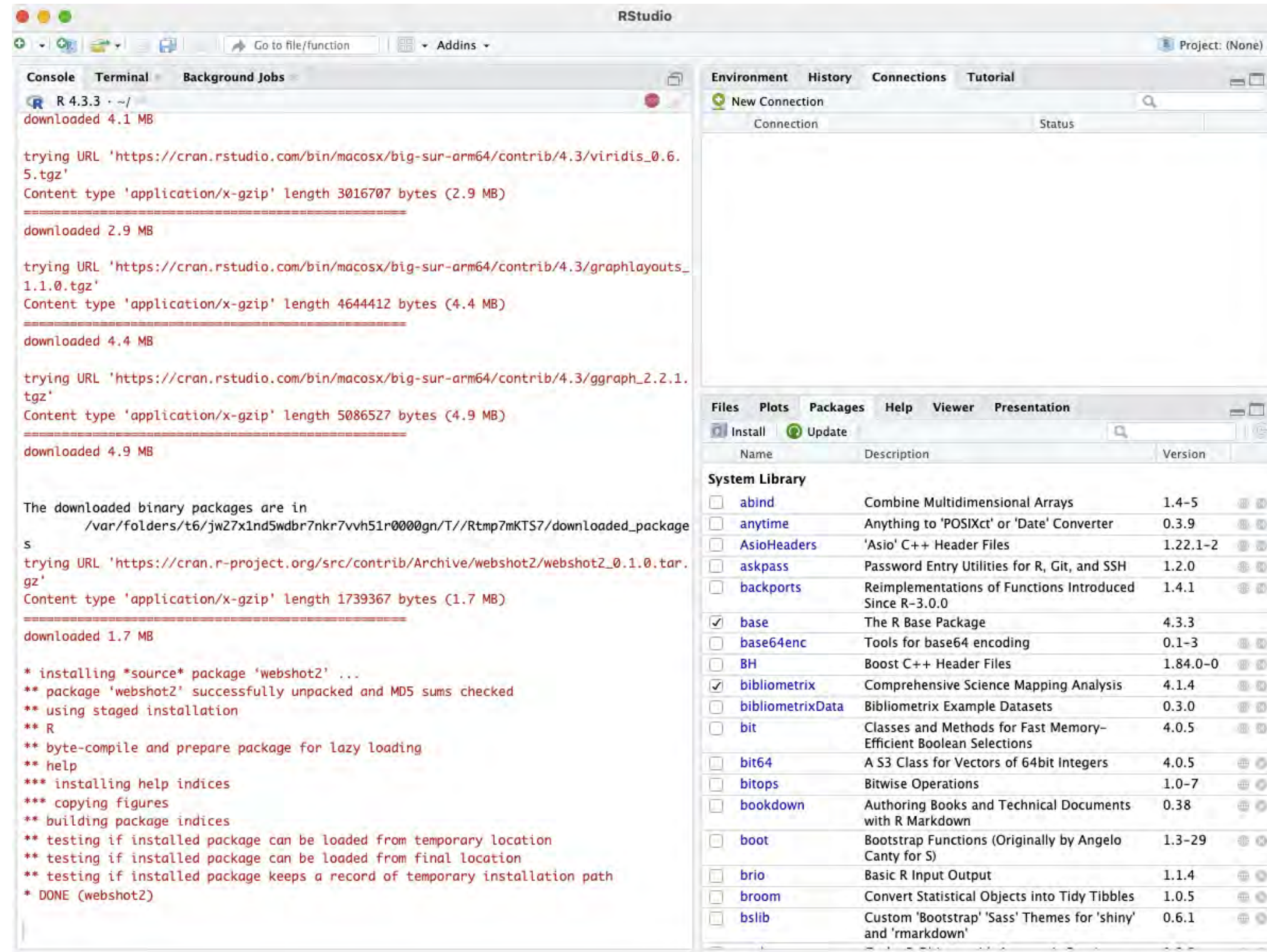
Open R or Rstudio (in console window) and digit:

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

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- 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 output of the bibliometrix installation process. The console shows the download of three binary packages (viridis_0.6.5.tgz, graphlayouts_1.1.0.tgz, and gggraph_2.2.1.tgz) and the installation of the webshot2 package from source. The installation of webshot2 is successful, and the console output shows the package being unpacked, MD5 sums checked, and help indices installed. The installed packages are listed in the Environment pane.

```
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/gggraph_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/jw27x1nd5wdb7nkr7vvh51r0000gn/T/Rtmp7mKTS7/downloaded_packages  
s  
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)
```

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



 bibliometrix

 biblioshiny

Info

SEARCH

Data

APPRAISAL

ANALYSIS

SYNTHESIS

CONTENT ANALYSIS

Content Analysis

biblioshiny: the shiny app for bibliometrix



Biblioshiny 5.0 now includes Biblio AI – a powerful AI assistant for your science mapping analyses.

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 displays 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 icons on the right. A left sidebar contains a menu with 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 & References'. The 'Import or Load' panel on the right includes 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 bottom status bar shows the URL '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)

Completeness of metadata -- 140 docs from Scopus

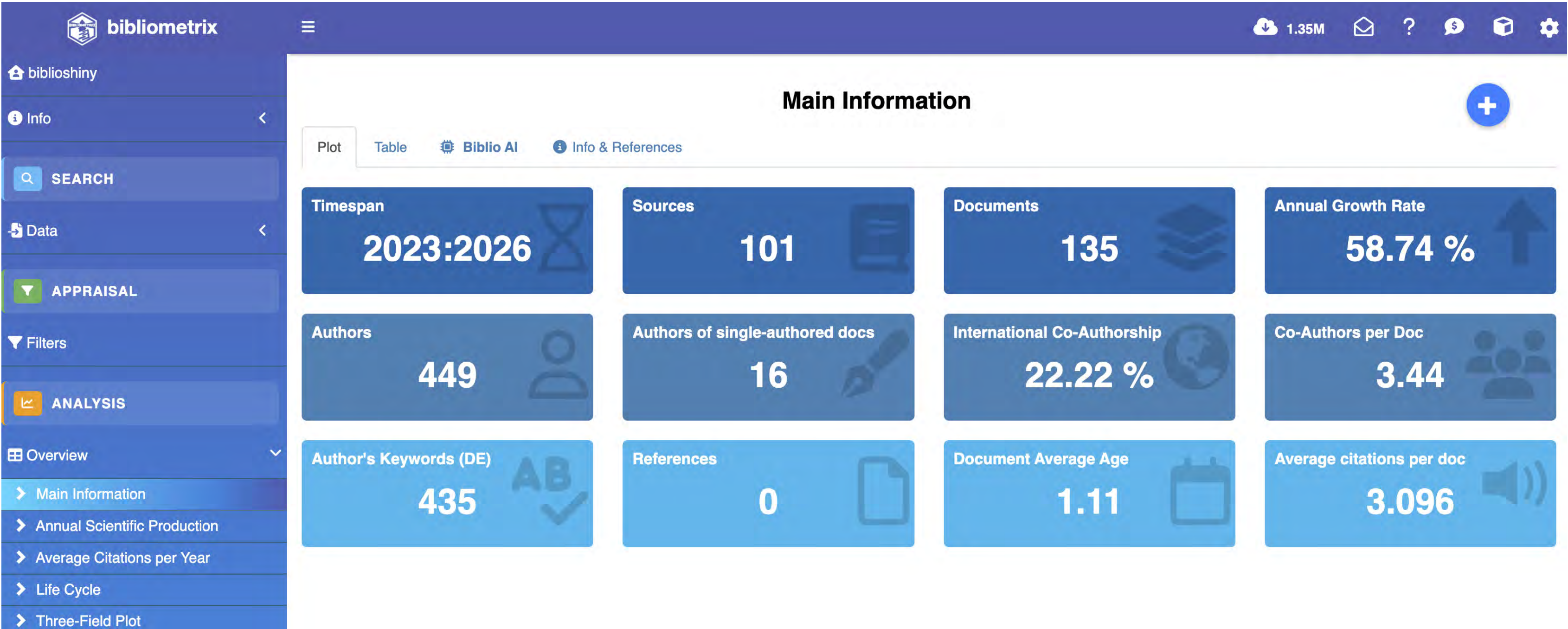
Advice Report Save Close



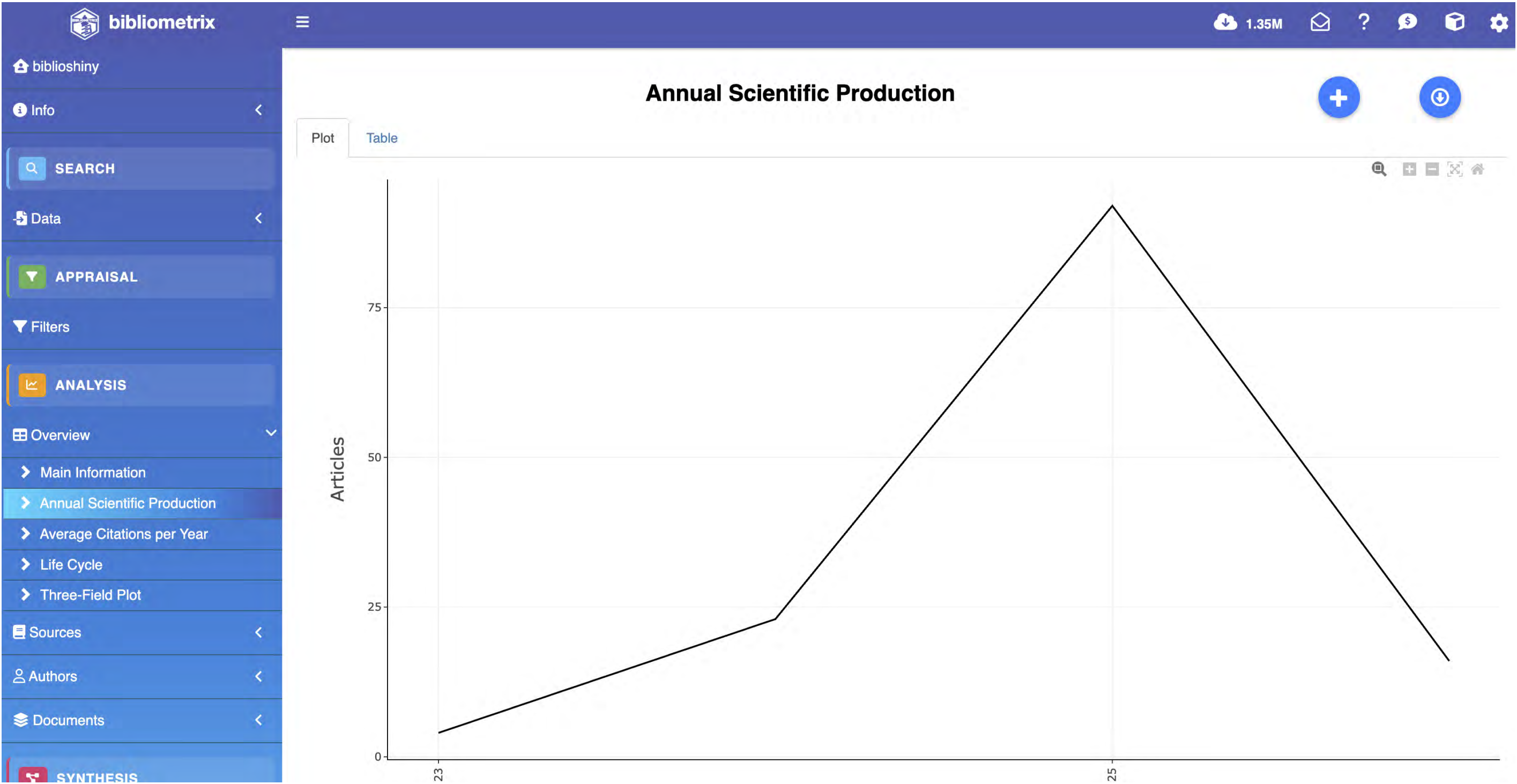
How to Conduct a Systematic Literature Review?

How to Conduct a Systematic Literature Review?

Analysing

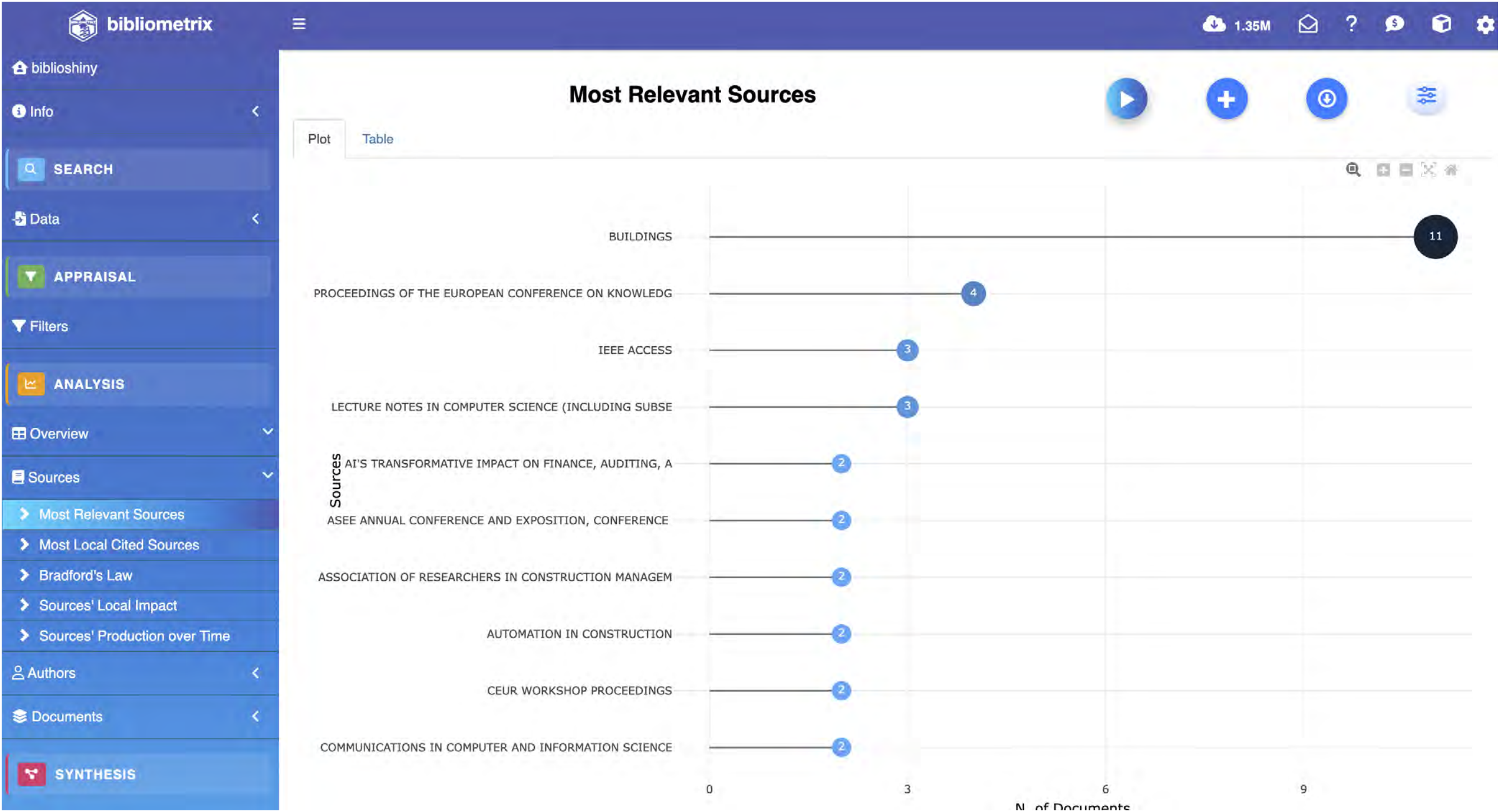


Analysing





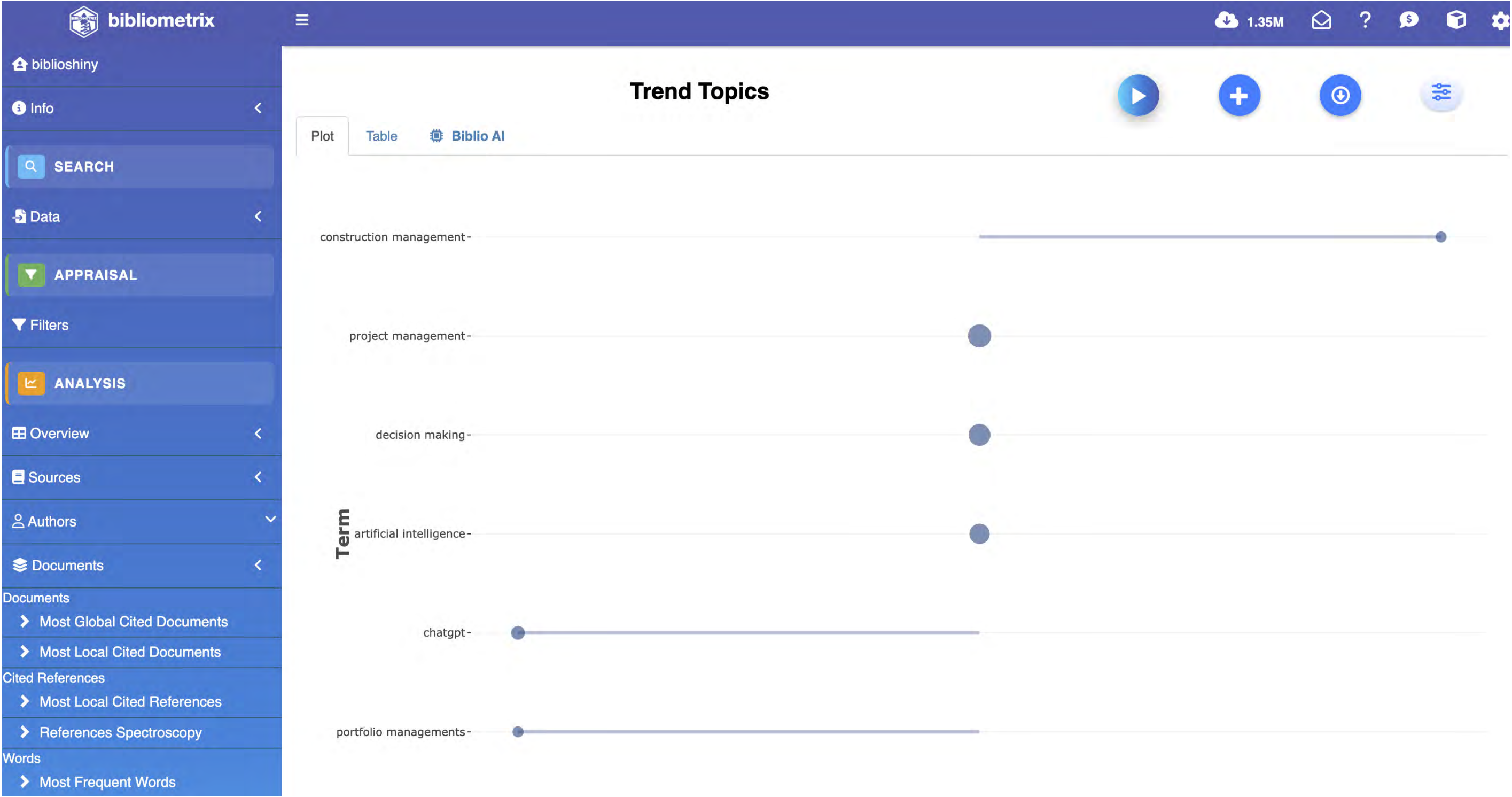
Analysing



Analysing

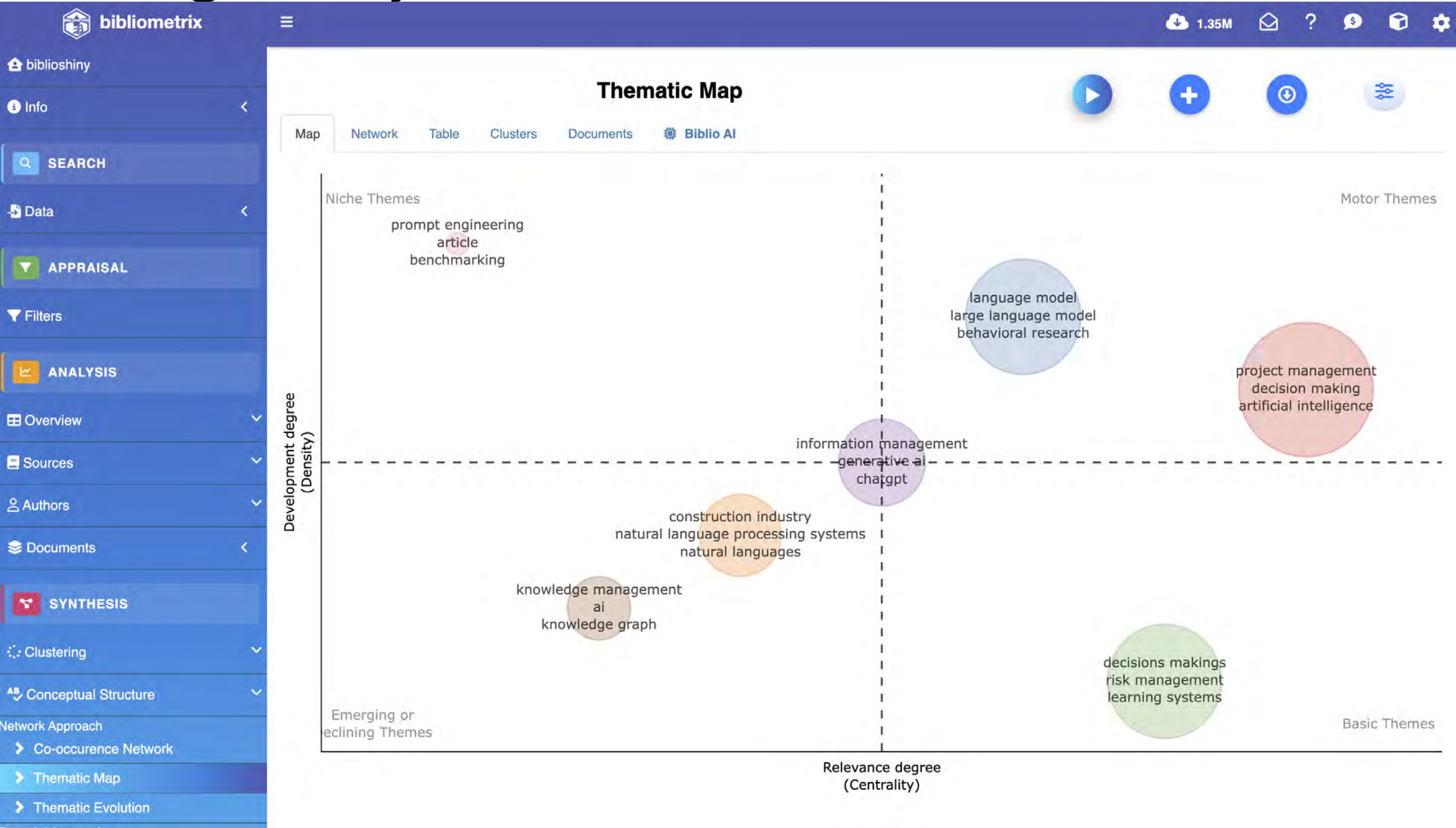


Analysing

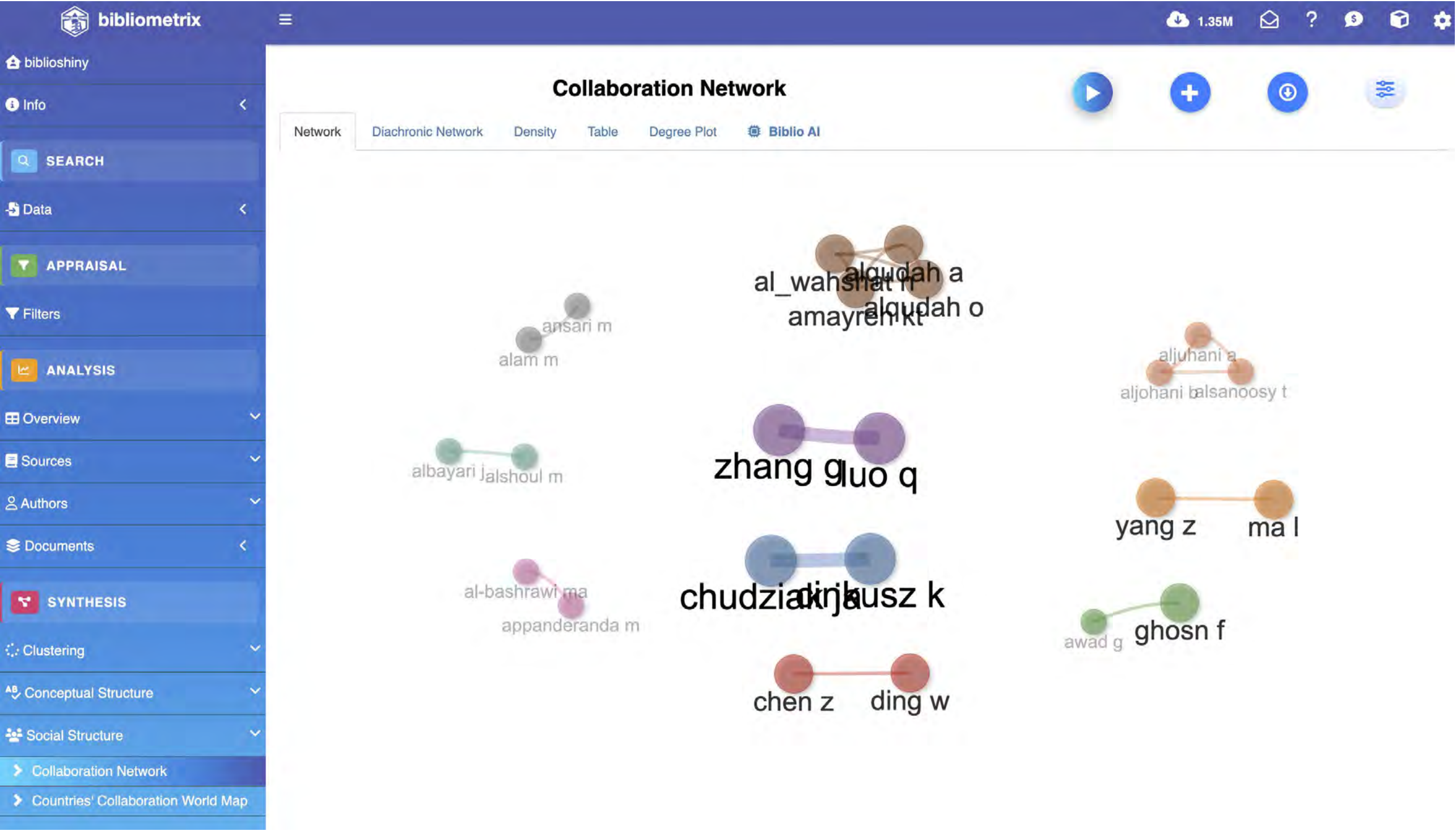




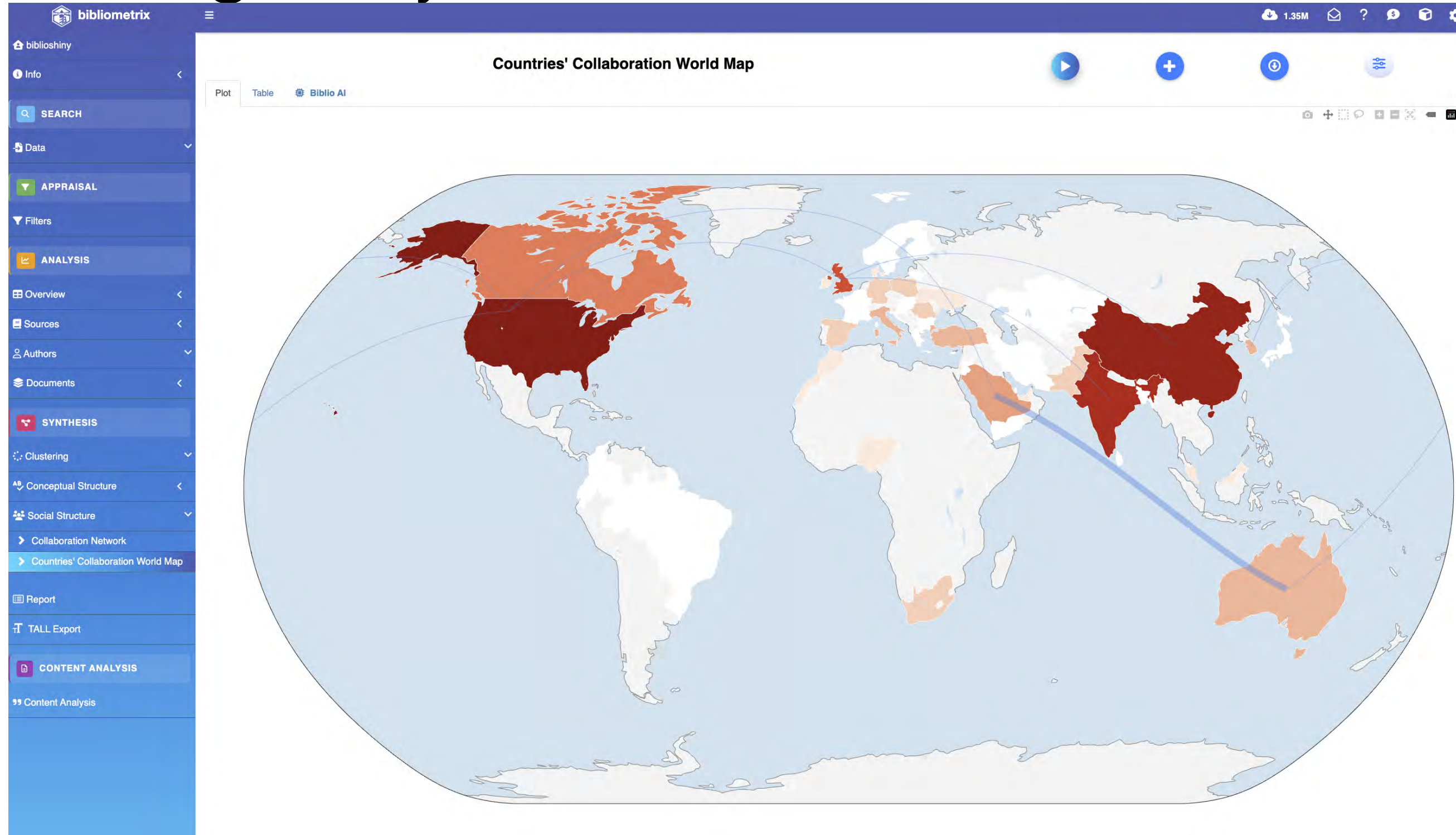
Making the synthesis



Making the synthesis



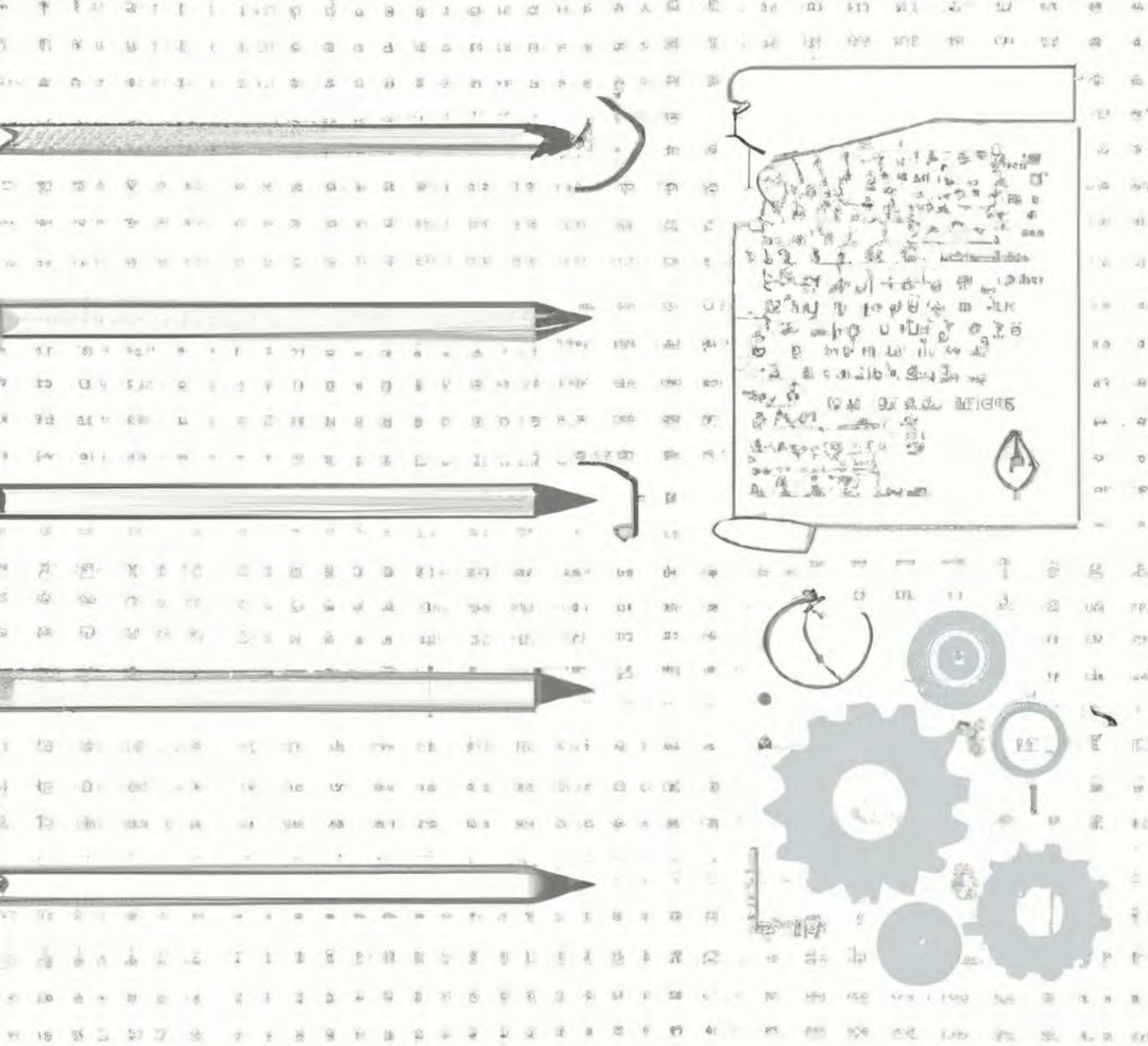
Making the synthesis



- SEARCH
- Data
 - Import or Load
 - API
 - Merge Collections
 - Reference Matching
- APPRAISAL
- Filters
- ANALYSIS
 - Overview
 - Sources
 - Authors
 - Documents
- SYNTHESIS
 - Clustering
 - Conceptual Structure
 - Social Structure
- Report
- TALL Export
- CONTENT ANALYSIS
- Content Analysis

262

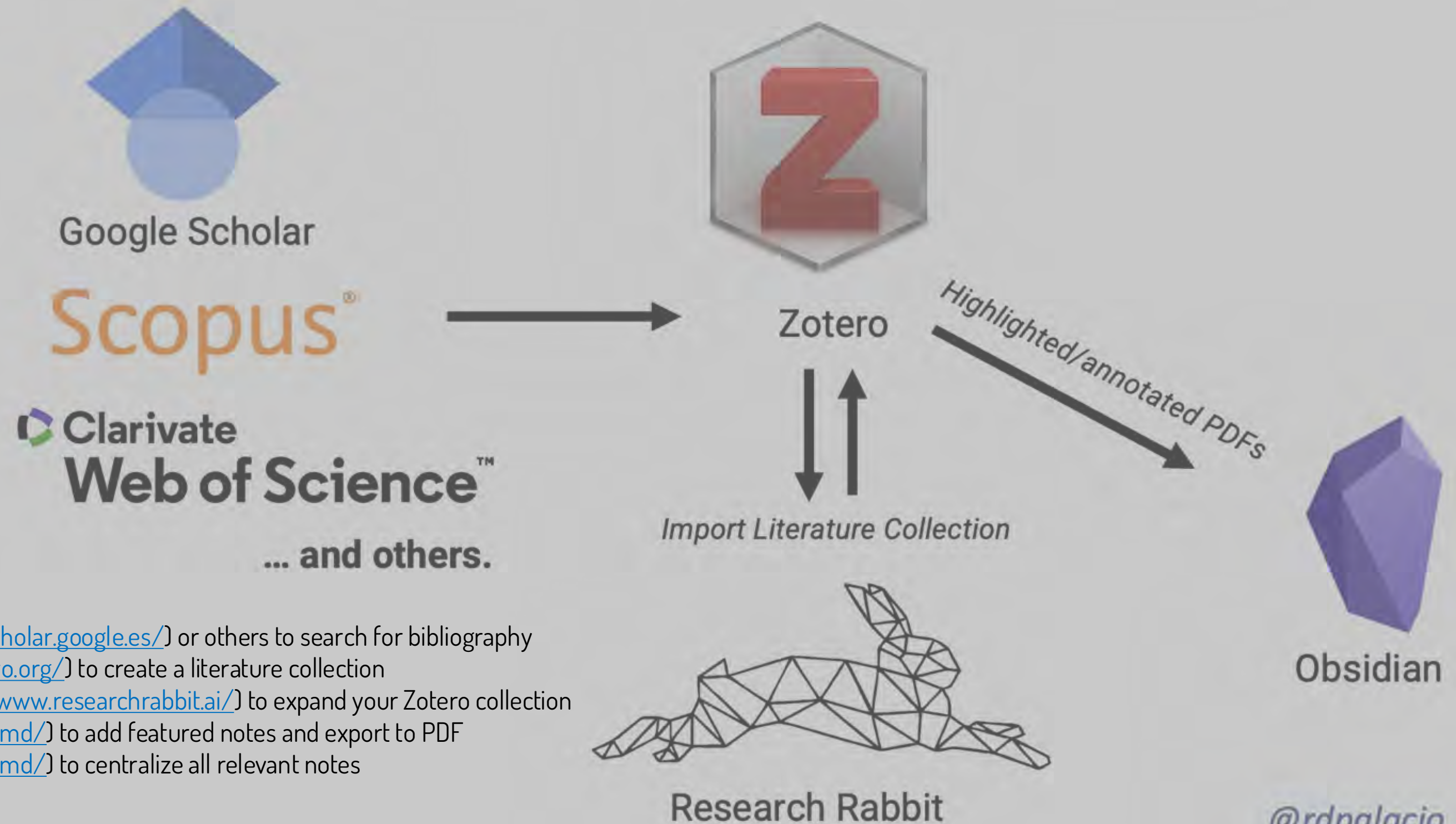
How to Conduct a Systematic Literature Review?



9. Collection of workflows and tools for conducting literature reviews

The Literature Review Workflow

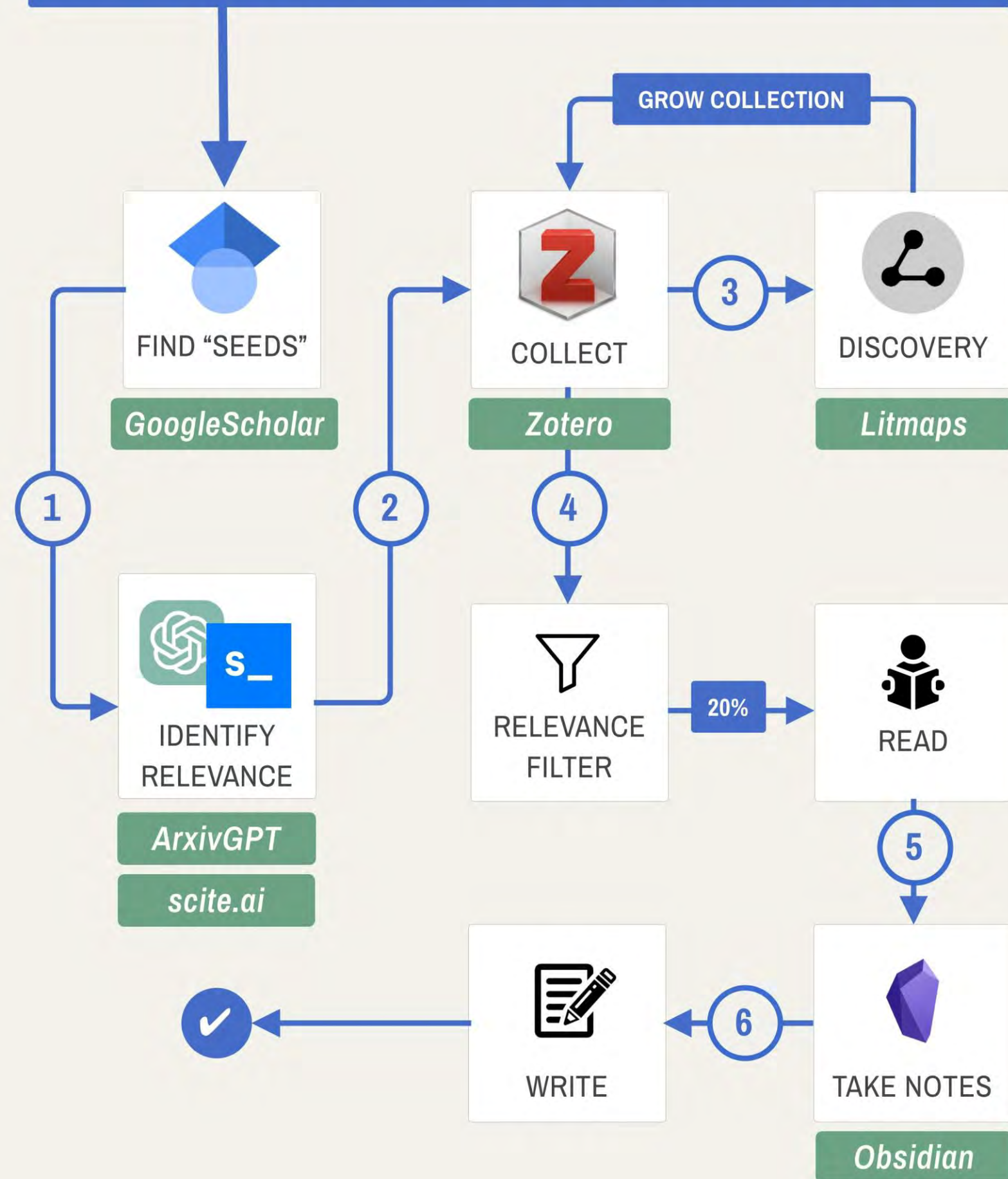
Ruben Dario Palacio, PhD



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

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**

∞ The Effortless Literature Review



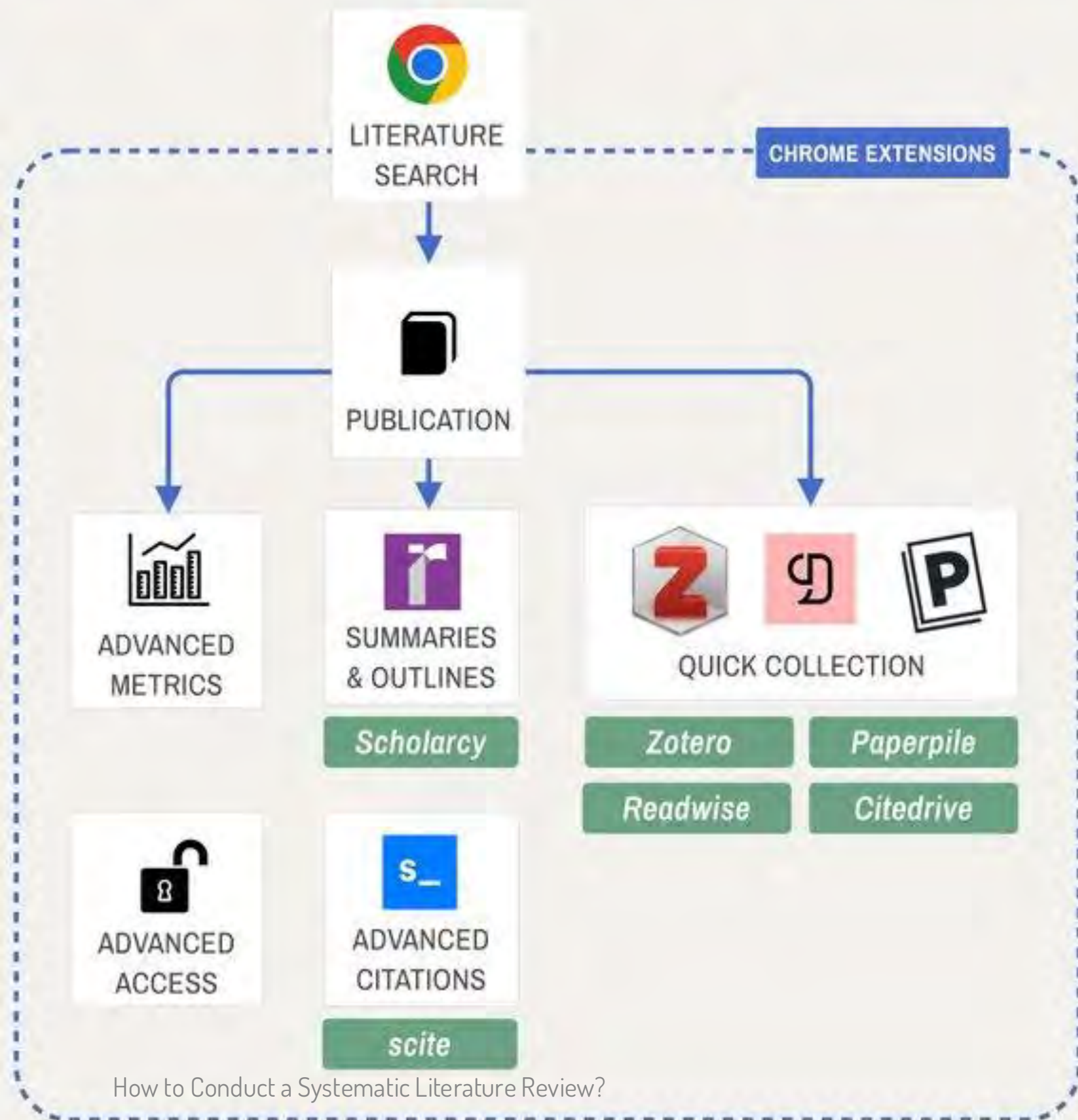
<https://twitter.com/Artifexx/status/1632277025472888833?s=20>

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>

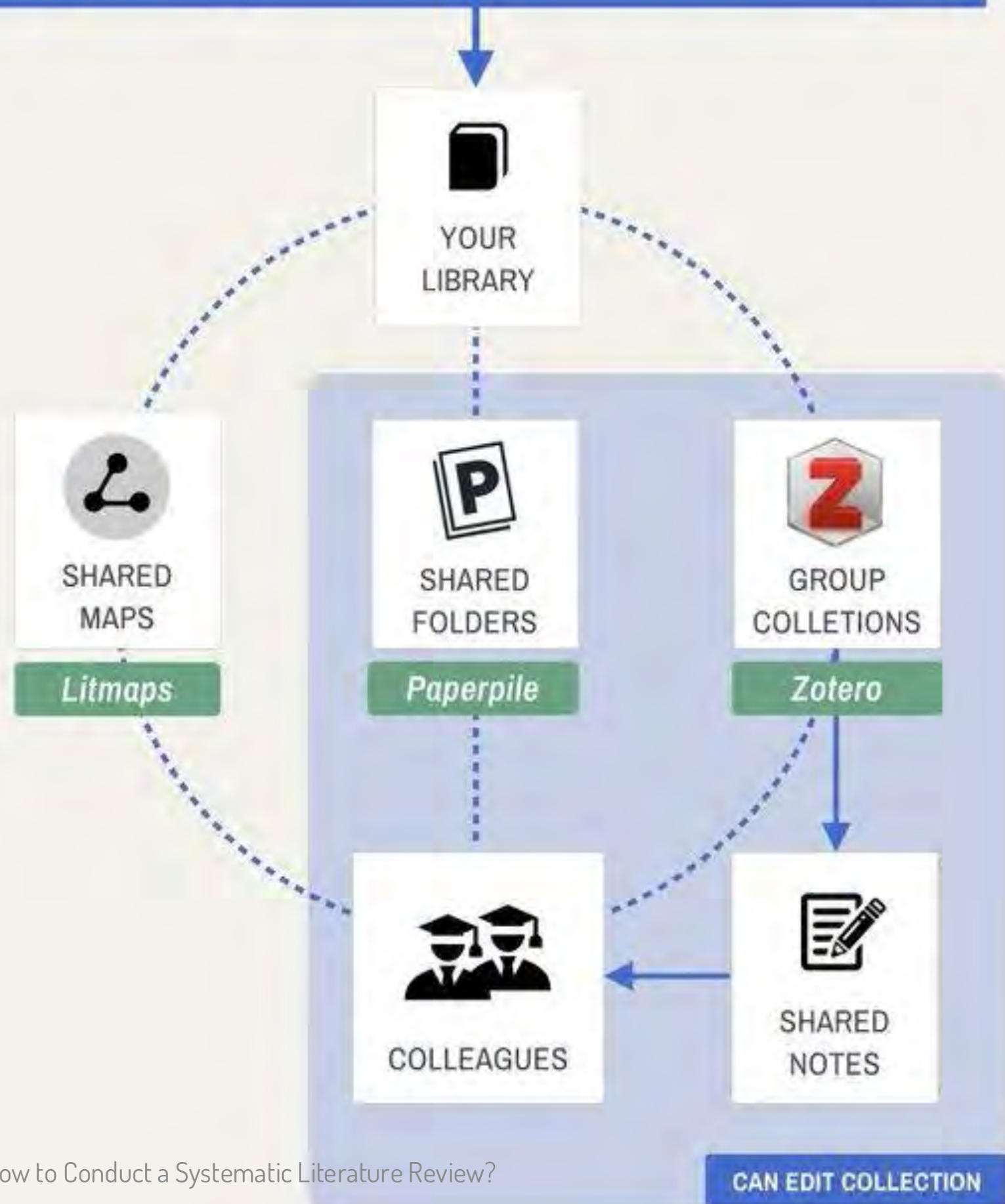
∞ The Literature Review Browser Setup



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

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



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

AI Literature Review - In 2025

READING & NOTES

1 SEED PAPER

Find a single prominent review paper. As recent as possible with as many citations as possible.



2 UPLOAD TO LITMAPS

Collect 10-20 connected papers (works with free version!). Look out for high citations, good journals.



3 EXPORT TO CSV

The Litmaps export will contain abstracts and become your reading list document.



6 ENJOY READING

Read papers that interest you. Take detailed notes. Focus on understanding key papers, not quickly skimming through many.



5 READING PLAN

Upload abstracts, titles, and intents to ChatGPT. Ask for a learning plan with key topics, reading order, and guiding questions.



4 READING INTENT

Keep a list of papers with reasons to read. Discard if interest fades or the reason becomes irrelevant.



7 TOPIC BASED NOTES

Identify key concepts. Instead of taking notes on papers, focus on concepts and aggregate knowledge from papers into concepts.



8 UPDATE READING LIST

While reading, identify must-read papers. Add them to your list, noting why you want to read it. Be very selective.



9 REVISE THE PLAN

If many new papers emerge, return to your reading plan (step 5) to adjust your reading efforts and focus only on relevant reading.



IDEAS & WRITING

12 WRITING SESSION

Write freely for 30 minutes about your topic. Reference papers and capture ideas without editing or overthinking. Repat.



11 RESEARCH ORACLE

Upload papers and your notes to a ChatGPT Project or Notebook LM. This AI can help you answer any questions on this domain.



10 TAKE A BREAK

When you stop encountering new ideas, this is a sign of conceptual saturation. Time to pause reading. Can happen after ~10 papers.



13 VISUALIZE CONCEPTS

Use Draw.io to map out key concepts and relationships. Visual diagrams help clarify connections and influence.



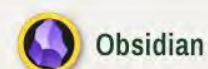
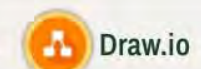
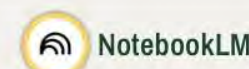
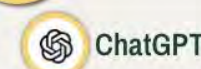
14 RESEARCH GAPS

Unconnected ideas in your diagram may reveal research gaps. These can inspire your lit review topic or new research questions.



15 DRAFT LIT REVIEW

Create a bullet-point outline. Use AI to expand points academically. Write and refine a draft into a publishable manuscript.



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>)



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82,993

07 Mar 2025

cs.AI

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cs.LG

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

Renmin University of China

DataCanvas Aiyas NeW

Researchers from Renmin University introduce R1-Searcher, a novel two-stage reinforcement learning framework that dramatically improves LLMs' ability to leverage external knowledge sources, achieving state-of-the-art performance on multi-hop question answering while demonstrating strong generalization to out-of-domain tasks through innovative separation of retrieval and answer incentives.

Problem

Method

Results

Takeaways

Bookmark

123

13,310

09 Mar 2025

cs.CV

cs.AI

cs.CL

Vision-R1: Incentivizing Reasoning Capability in Multimodal Large Language Models

East China Normal University

Xiaohongshu Inc.

Researchers from East China Normal University and Xiaohongshu Inc. introduce Vision-R1, a 7B-parameter multimodal language model that achieves comparable reasoning performance to 70B+ parameter models through innovative combination of modality bridging, cold-start initialization, and progressive thinking suppression training, demonstrating +6% improvement across multimodal math reasoning benchmarks.

Problem

Method

Results

Takeaways

Bookmark

75

13,359

10 Mar 2025

cs.LG

cs.AI

stat.ML

Inductive Moment Matching

Stanford University

Luma AI

Researchers from Stanford and Luma AI introduce Inductive Moment Matching (IMM), a generative modeling framework that enables high-quality image generation in 1-8 inference steps while maintaining training stability, achieving a state-of-the-art FID score of 198 on CIFAR-10 with just 2 steps.

Problem

Method

Results

Takeaways

Bookmark

60

8841

10 Mar 2025

ensemble-methods

uncertainty-estimation

model-interpretation

Improving Deep Ensembles by Estimating Confusion Matrices

University of Oxford

Lancaster University

Researchers from Lancaster University and Oxford introduce Soft David Skene (SDS), a novel aggregation method for deep ensembles that estimates confusion matrices for each ensemble member, achieving superior accuracy and calibration compared to traditional ensemble averaging while demonstrating improved robustness to distributional shifts.

Problem

Method

Results

Takeaways

Bookmark

78

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

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

Huatong Song¹, Jinhao Jiang^{1*}, Yingqian Min¹, Jie Chen¹, Zhipeng Chen¹, Wayne Xin Zhao¹, Lei Fang², Ji-Rong Wen¹
¹Gaoling School of Artificial Intelligence, Renmin University of China.
²DataCanvas Aiyas NeW
{songhuatong123, jiangjinhao}@ruc.edu.cn
batmanfly@gmail.com

Abstract

Existing Large Reasoning Models (LRMs) have shown the potential of reinforcement learning (RL) to enhance the complex reasoning capabilities of Large Language Models (LLMs). While they achieve remarkable performance on challenging tasks such as mathematics and coding, they often rely on their internal knowledge to solve problems, which can be inadequate for time-sensitive or knowledge-intensive questions, leading to inaccuracies and hallucinations. To address this, we propose **R1-Searcher**, a novel two-stage outcome-based RL approach designed to enhance the search capabilities of LLMs. This method allows LLMs to autonomously invoke external search systems to access additional knowledge during the reasoning process. Our framework relies exclusively on RL, without requiring process rewards or distillation for a cold start. Our experiments demonstrate that our method significantly outperforms previous strong RAG methods, even when compared to the closed-source GPT-4o-mini. The code is available at <https://github.com/SsmallSong/R1-Searcher>.

1 Introduction

Large Reasoning Models (LRMs), such as OpenAI-o1 [1], Deepseek-R1 [2] and Kimi-k1.5 [3], have demonstrated the significant impact of reinforcement learning (RL) in enhancing the reasoning capabilities of large language models (LLMs) [4]. However, since they primarily rely on their internal knowledge, these models may struggle with open-ended tasks, particularly those involving knowledge-intensive questions [5, 6], private information in local databases [7, 8], and time-sensitive issues [9, 10]. This reliance may easily lead to inaccuracies and hallucinations. Therefore, it is crucial to enable LLMs to access external information during the reasoning process to achieve more deliberative reasoning [11].

To address this issue, extensive research has focused on augmenting LLMs with external information sources (*a.k.a.*, retrieval-augmented generation (RAG) [12, 13]). Early approaches emphasize specific prompting strategies to guide LLMs in iterative question decomposition, query generation, and sub-question answering [14, 15, 16]. While effective, these complex prompt designs may rely on closed-source LLMs for achieving optimal performance. Subsequent studies investigate to distill this capability into smaller LLMs through supervised fine-tuning (SFT) [17]. However, recent findings suggest that SFT-based distillation can cause models to memorize solution paths, limiting their generalization to novel scenarios [18]. Recent proposals include a test-time scaling method [11, 19], notably employing the Monte Carlo Tree Search (MCTS) framework to enhance solution-finding by expanding the search space during inference. Despite its promise, this approach incurs significant

^{*}Equal contribution.
[†]Correspondence to Wayne Xin Zhao.
Preprint. Under review.

Comments

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Explain this paper in 100 words

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 leading 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, improving LLMs' ability to retrieve and integrate information effectively.

Summarize this paper in 100 words

R1-Searcher enhances LLM 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 phased reward system: initial rewards for successful retrieval and subsequent rewards for accurate reasoning. Experiments show R1-Searcher significantly outperforms strong RAG methods, even closed-source models, on multiple 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.

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.

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

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- [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.

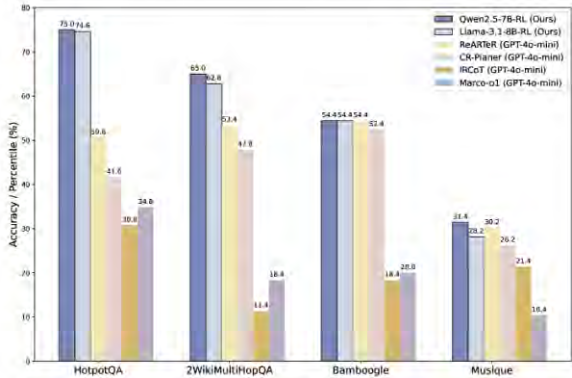


Figure 1: Performance comparison of R1-Searcher (using Qwen-2.5-7B-RL and Llama-3.1-8B-RL) against existing methods across four QA benchmarks, showing significant improvements on both in-domain (HotpotQA, 2WikiMultiHopQA) and out-of-domain (Bamboogle, Musique) datasets.

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



GR|AL

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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.

Ask Additional Question

ASK

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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)

Cite as: arXiv:2503.09436 [cs.HC]
(or arXiv:2503.09436v1 [cs.HC] for this version)
<https://doi.org/10.48550/arXiv.2503.09436>

Related DOI: <https://doi.org/10.1145/3708359.3712150>

Submission history

From: Krzysztof Adamkiewicz [view email]

[v1] Wed, 12 Mar 2025 14:31:50 UTC (7,663 KB)

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

M-learning enhances collaboration to be more personalized and effective. The Moodbile project aims to develop applications with the LMS, stimulating learning activities. These activities are intended to be used in MS. Moodbile aims to propose an interface for external applications with the LMS.

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

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How to Conduct a Systematic Literature Review?

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Rayyan

Overview

Review data

Screening

Full text screening

Data extraction

Blind mode

Screening criteria

Stay caught up with review updates

Edit info

Invite members

PRISMA

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

2,865

Add References

Total Duplicates

2,776

Detect Duplicates

Unresolved

0

Continue Resolving

Resolved647

Not Duplicate1

Deleted2,128

Review Members

Name	Email	Role	Status
		Owner	Active
		Reviewer	Active
		Reviewer	Active

Screening

Blind On

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

Add Inclusion Criteria

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





Al-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

Imported References

All References2,695

3rd pt3 IEEE Xplo...14

2nd pt2 IEEE Xplo...93

3rd pt2 IEEE Xplo...100

1st pubmed-Phish...23

Add References

Possible Duplicates

Unresolved0

Deleted2,128

Not Duplicate1

Resolved647

Detect Duplicates

Showing 737 Articles

All References

Title

Date

Author

1Where to Kill the Cyber Kill-Chain: An Ontology-Driven Framework for IoT Security Analytics2016-01-01M. Mohsin; Z. ...

2Systematic Review of E-commerce Security Issues and Customer Satisfaction Impact2022-01-01M. Qasaimeh; ...

3GeoPal: Friend Spam Detection in Social Networks Using Private Location Proofs2016-01-01B. Carbunar; ...

4Similarity Analysis of Ransomware based on Portable Executable (PE) File Metadata2021-01-01M. A. Ayub; A...

5Obfusc8: LLM-Augmented PowerShell Obfuscation2025-01-01K. Keum; D. K...

6Advanced Analysis of Email Sender Spoofing Attack and Related Security Problems2022-01-01B. Yu; P. Li; J...

7Gamified Social Collaboration via Mesh CoP: Effectiveness in Enhancing Cybersecurity Awareness2025-01-01M. Warasart; ...

8Loki: A Physical Security Key Compatible IoT Based Lock for Protecting Physical Assets2022-01-01S. Chakkarav...

9Chatbots2024-01-01Divya Nair

10What the App is That? Deception and Countermeasures in the Android User Interface2015-01-01A. Bianchi; J. ...

11Building robust temporal user profiles for anomaly detection in file system accesses2016-01-01S. Mehnaz; E...

12Ensure the Grid Interfaces and Payment Gateways Against Data Breach Attacks and Malware: Electric Vehicle Charging Station via Cybersecurity2025-01-01P. C. Karana...

13Enhanced Anomaly Detection in Ethereum: Unveiling and Classifying Threats With Machine Learning2024-01-01A. Ehsan; Z. L...

14Ensuring Security and Privacy in Digital Healthcare System2025-01-01Khadlja; K. Sl...

15Machine Learning Algorithm for Sensitive Data Classification on Cloud Environment2025-01-01R. Osari; R. Sl...

Filters

Keywords for include

Select All

phishing499

AI150

machine learning137

personality83

email phishing14

compared with4

randomly3

crossover2

randomized2

psychological predictors2

Show more

Keywords for exclude

Select All

survey76

literature review26

phone17

reviews13

SMS12

prevalence12

this review9

systematic review8

regression analysaes6

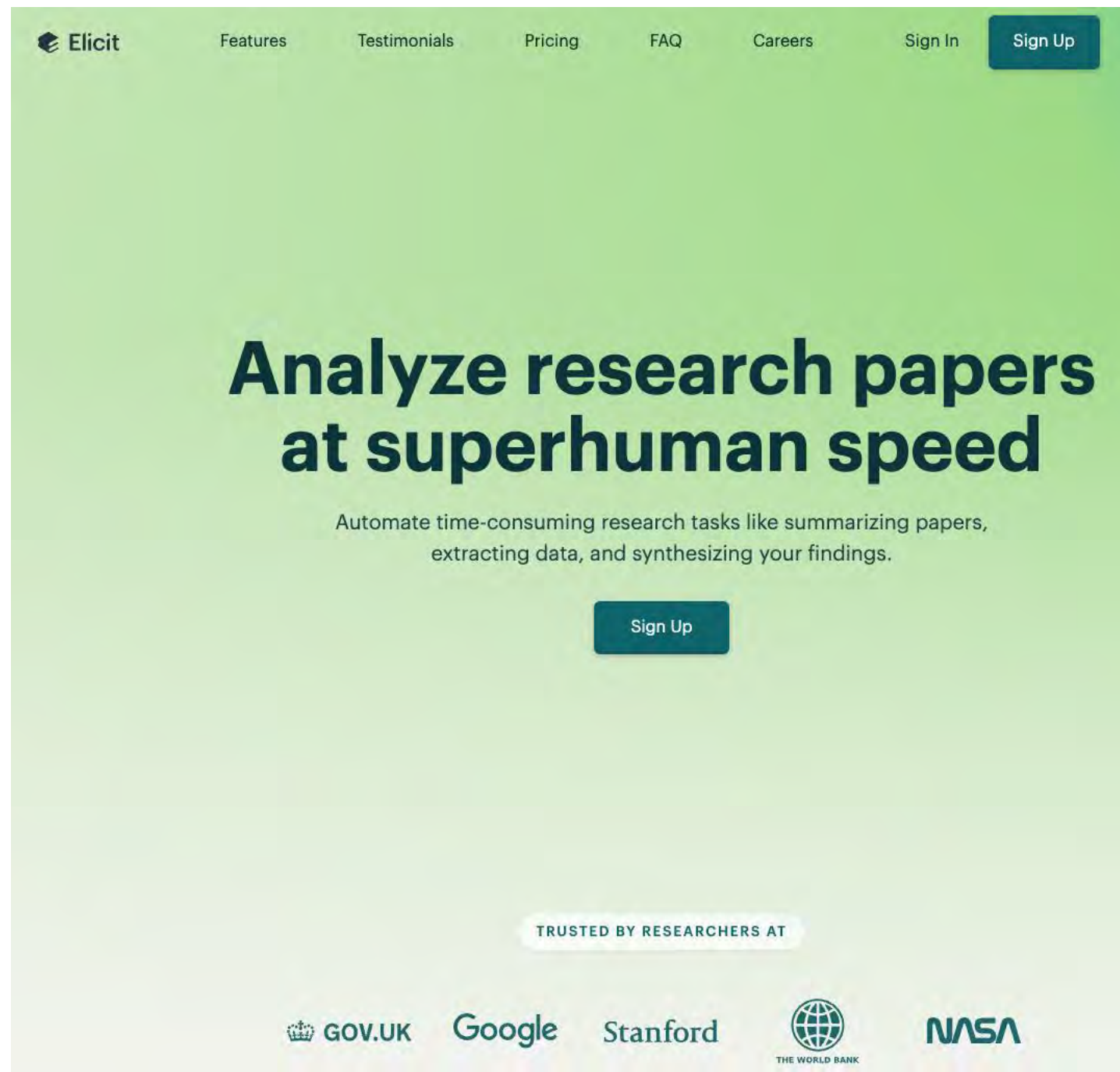
longitudinal5

Show more

Labels

Select All

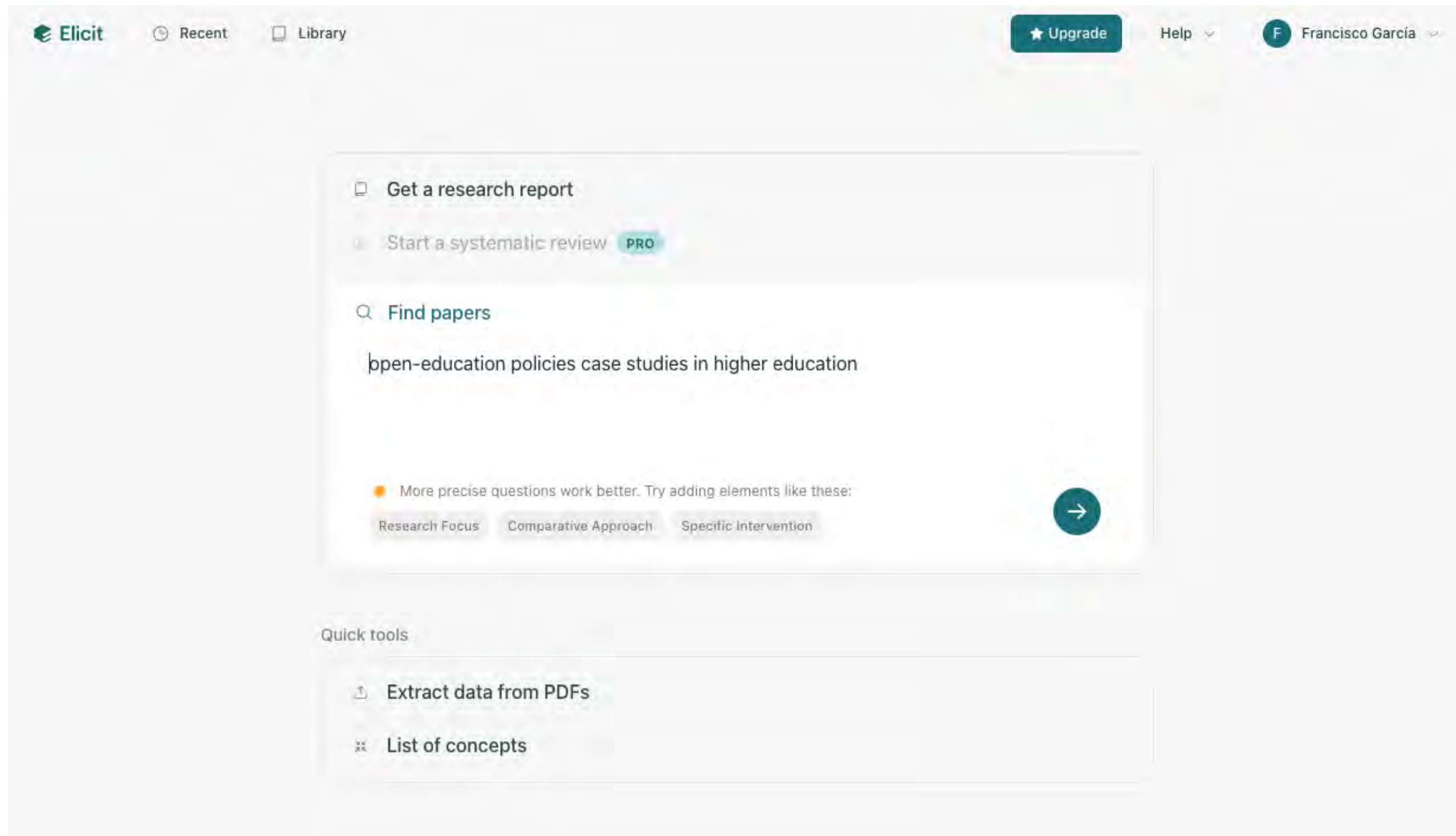
useful43



- 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



Elicit – Article search

References

Search box

Summary

More fields can be added to the analysis

Elicit

Recent

Library

Open Education Policies in Higher Education

Share

open-education policies case studies in higher education

Summary of top 4 papers

Copy

Open educational resources (OER) and practices (OEP) have gained significant traction in higher education globally. Case studies reveal that OER can improve student performance, reduce costs, and increase access to learning materials (Wong & Li, 2019). In Australia, government initiatives have supported OEP transformation, though challenges like restrictive copyright regimes persist (Bossu, 2016). European and Latin American institutions have implemented various OER strategies, including organizational culture change, flexible certification, and new business models (Inamorato et al., 2012). However, the impact of OER on employability is often unmeasured, and MOOC completion rates remain low (Souto-Otero et al., 2016). Barriers to OER adoption include lack of policy support, technological infrastructure limitations, and intellectual property concerns (Wong & Li, 2019). To enhance OER effectiveness, institutions should develop supportive policies, foster collaboration in OER development, and customize content for specific needs (Wong & Li, 2019).

Sort: Most relevant

Filters

Export as

UPGRADE

Paper	Abstract summary	Manage Columns
OpenCases: Case Studies on Openness in Education M. Souto-Otero +7 2016 · 11 citations · DOI	The study provides case studies on open education policies and activities in higher education, finding that while OER have reached many learners, MOOC completion rates are low and accreditation is not formalized.	Search or create a column Describe what kind of data you want to extract e.g. Limitations, Survival time ADD COLUMNS Summary Main findings Methodology Intervention Outcome measured Limitations Show more
Using Open Educational Resources for Teaching in Higher Education: A Review of Case Studies B. Wong +1 International Symposium on Electronics and Telecommunications 2019 · 10 citations · DOI	Open educational resources in higher education can improve student performance and access, but face limitations in policy, infrastructure, and other areas.	
Open Educational Practices in Australia Carina Bossu 2016 · 3 citations	Open educational practices have transformed higher education in Australia, but challenges remain around copyright and policy.	
Open Educational Resources: Cases from Latin America and Europe in Higher Education Andreia Inamorato +2 2012 · 3 citations	This compendium discusses experiences of higher education institutions in Latin America and Europe that have offered open educational resources.	
Policy Approaches to Open Education - Case Studies from 28 EU Member States (OpenEdu Policies) Inamorato Dos Santos Andreia +6 2017 · 24 citations · DOI	The paper provides an overview of open education policies across the 28 EU member states.	
Survey and Reflection of Open Education Policies Junfeng Yang +1 2017 · 9 citations · DOI	This paper reviews open education policies at different levels to promote educational equity and quality.	
Openness and praxis: Exploring the use of open educational practices in higher education C. Cronin 2017 · 309 citations · DOI	Open educational practices in higher education are complex, personal, and contextual, requiring research-informed policies and collaborative approaches to support staff and students.	
A review of the use of open educational resources: the benefits, challenges and good practices in higher education B. Wong +1 International Journal of Innovation and Learning 2021 · 3 citations · DOI	This review covers the benefits, challenges, and good practices in the use of open educational resources in higher education.	

Add new step

Elicit – Article search



8 selected

+ Search citation trails

Delete

Sort: Most relevant

Filters

Export as

UPGRADE

Paper	Abstract summary
OpenCases: Case Studies on Openness in Education M. Souto-Otero +7 2018 · 11 citations · DOI	The study provides case studies on open education policies and activities in higher education, finding that while OER have reached many learners, MOOC completion rates are low and accreditation is not formalized.
Using Open Educational Resources for Teaching in Higher Education: A Review of Case Studies B. Wong +1 International Symposium on Electronics and Telecommunications 2019 · 10 citations · DOI	Open educational resources in higher education can improve student performance and access, but face limitations in policy, infrastructure, and other areas.
Open Educational Practices in Australia Carina Bossu 2016 · 3 citations	Open educational practices have transformed higher education in Australia, but challenges remain around copyright and policy.
Open Educational Resources: Cases from Latin America and Europe in Higher Education Andreia Inamorato +2 2012 · 3 citations	This compendium discusses experiences of higher education institutions in Latin America and Europe that have offered open educational resources.
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A review of the use of open educational resources: the benefits, challenges and good practices in higher education B. Wong +1 International Journal of Innovation and Learning 2021 · 3 citations · DOI	This review covers the benefits, challenges, and good practices in the use of open educational resources in higher education.

Load more

Manage Columns

Search or create a column

Describe what kind of data you want to extract

e.g. Limitations, Survival time

ADD COLUMNS

+ Summary

+ Main findings

+ Methodology

+ Intervention

+ Outcome measured

+ Limitations

Show more

Create a new table from selected papers

8 papers

Summarize abstracts for selected papers

UPGRADE 8 / 4 papers

Chat with papers

Beta

UPGRADE 8 / 4 papers

Ask a new question and find papers

Extract data from uploaded papers

Get a list of concepts

Add a new step

8 papers selected

Elicit – Explore concepts



Elicit

RecentLibrary

UpgradeHelpFrancisco Garcia

open-education policies case studies in higher education

Found 58 papers

Found 89 concepts in 58 papers

Found 22 unique concepts

Final answer

CSVUPGRADE

Concept	Source
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.	"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
Global Open Education Initiatives 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 "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 "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 "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 "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 "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 "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 "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 "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 "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 "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 selection of their teaching resources freely available, open educational resources (OER)." C. Haddad, J. Williams & P. Spring 2018

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
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.	"Macro and microventures resources by the university faculty teaching online and a high-quality and low-cost alternative to traditional textbooks." S. Norris 2017
Global Open Education Initiatives 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

RELEVANT QUOTES 1 of 2

Open paper

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.

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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

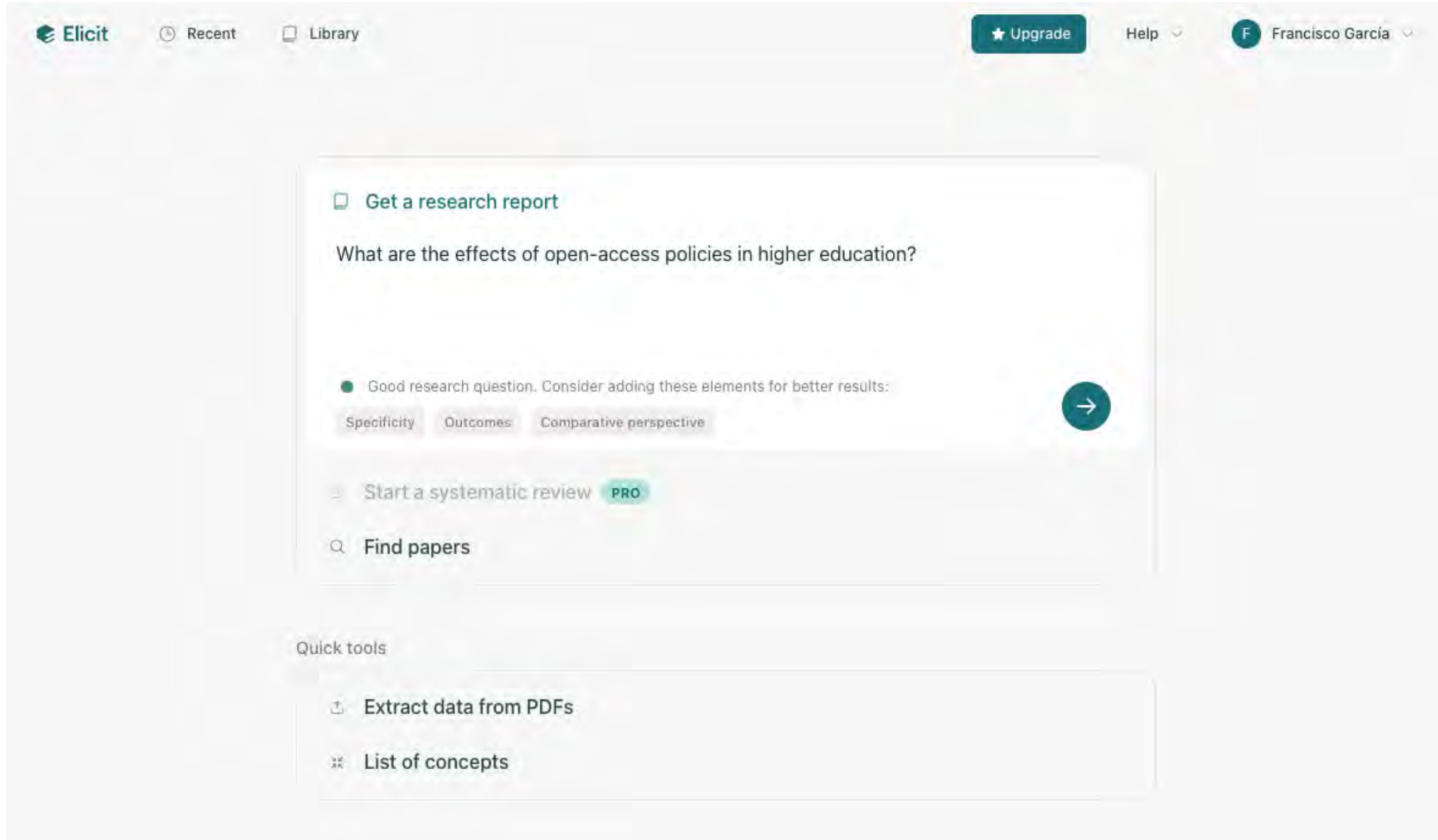
Copy

USD's stipend program

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

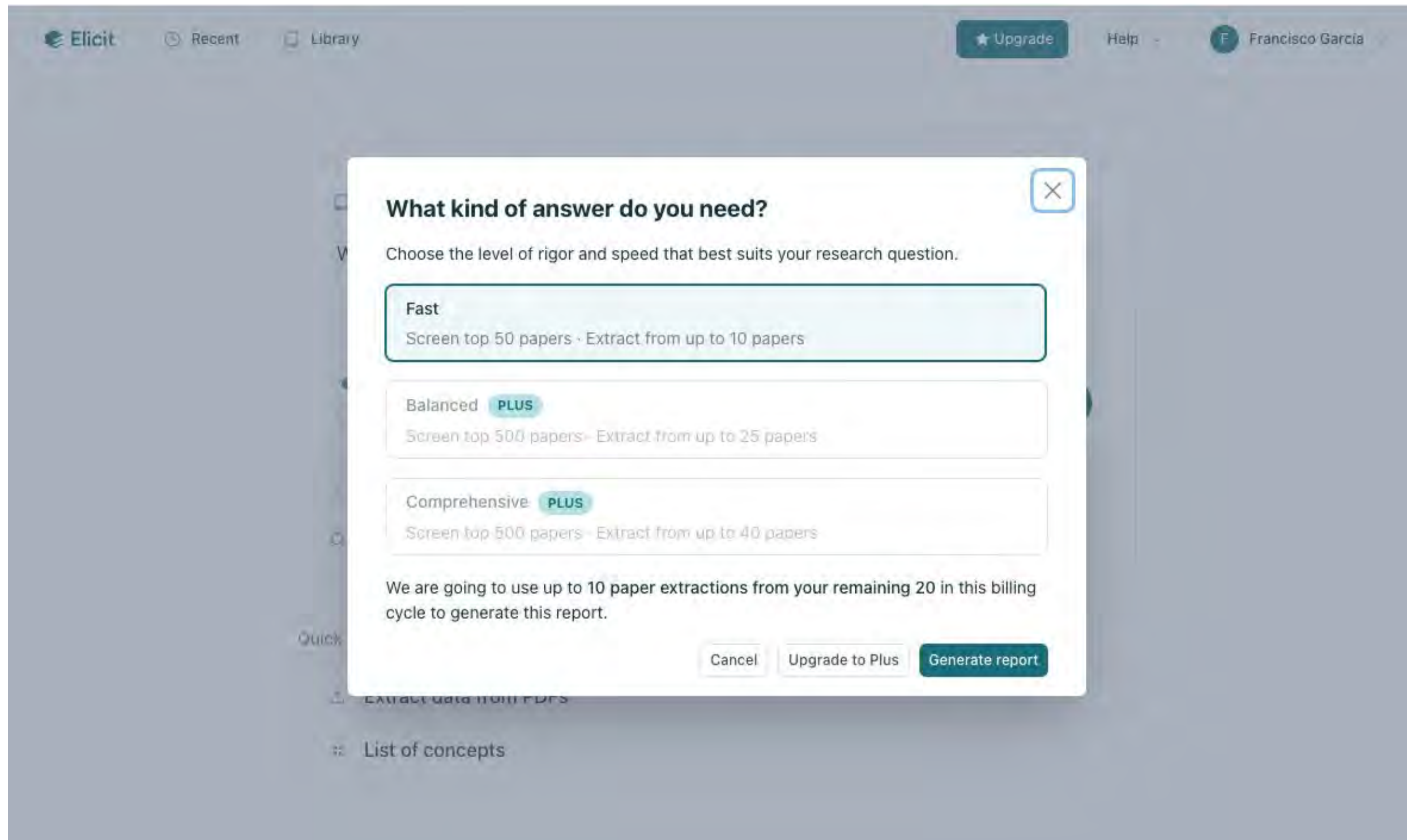
Open educational resources (OER) provide a high-quality and low-cost alternative to traditional textbooks. The University of Central Florida (UCF) and the University of San Diego (USD) have been engaged in a multitude of efforts related to OER and textbook affordability. This article will discuss the 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



The screenshot shows the Elicit web application interface. At the top, there is a navigation bar with the Elicit logo, links for 'Recent' and 'Library', an 'Upgrade' button, a 'Help' dropdown, and a user profile for 'Francisco García'. The main content area features a large input box for a research question. The question entered is 'What are the effects of open-access policies in higher education?'. Below the question, a green dot indicates a 'Good research question' and suggests adding elements for better results: 'Specificity', 'Outcomes', and 'Comparative perspective'. To the right of these suggestions is a green circular button with a white arrow. Below the input box, there are three options: 'Start a systematic review' (marked with a 'PRO' badge), 'Find papers', and 'Quick tools'. The 'Quick tools' section includes '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' and 'Library' tabs, an 'Upgrade' button, a 'Help' link, 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 instructs the user to 'Choose the level of rigor and speed that best suits your research question.' It offers 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). Below these options, a message states: 'We are going to use up to 10 paper extractions from your remaining 20 in this billing cycle to generate this report.' At the bottom of the modal are three buttons: 'Cancel', 'Upgrade to Plus', and 'Generate report'.

What kind of answer do you need?

Choose the level of rigor and speed that best suits your research question.

- Fast**
Screen top 50 papers · Extract from up to 10 papers
- Balanced PLUS**
Screen top 500 papers · Extract from up to 25 papers
- Comprehensive PLUS**
Screen top 500 papers · Extract from up to 40 papers

We are going to use up to 10 paper extractions from your remaining 20 in this billing cycle to generate this report.

Cancel Upgrade to Plus Generate report

Elicit – Explore a research question



ElicitRecentLibrary

Effects of Open-Access Policies in Higher ...

Research reportView only

Effects of Open-Access Policies in Higher Education

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).

Screen papers90% · 1:08 elapsed (3 minutes estimated)

View next

Papers screened in –

Generating screening criteria and evaluating 50 papers.

Column	Definition	Criteria matches (yes/maybe/no)
Setting	Was the study conducted in a higher education institution (university or college)?	28124
Policy Level	Does the study examine institutional-level open-access policies (rather than individual journal policies or practices)?	51326
Study Design	Is the study an empirical investigation (quantitative, qualitative, mixed methods) or a systematic review/meta-analysis?	161117
Outcomes	Does the study measure at least one of the following: research visibility, citation impact, institutional costs, or faculty compliance with open-access policies?	6533
Infrastructure	Does the study analyze institutional repositories or open-access publishing platforms?	4733
Evidence Base	Does the study present original data or analysis (rather than just opinion or theory)?	16721
Scope	Does the study focus on research outputs (rather than educational materials or K-12 education)?	19916

Report

Status

Gather papers

50 papers found

Screen papers

Filtering studies based on inclusion criteria

Extract data

Capturing key metrics and findings from every paper

Generate report

Summarizing findings

Chat

Hang tight — you'll be able to chat with this report once it's generated

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Effects of Open-Access Policies in Higher ...

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Extract dataCompleted in 0:59

View next

Data points extracted 30

Capturing key data and findings from papers using the following criteria

Column	Definition	Most recent extraction
Study Design	Identify and record the specific type of study design used: - Descriptive study - Longitudinal study - Survey - Comparative analysis - Mixed-methods study Locate this information primarily in the methods section. If the design is not explicitly stated, carefully review the methodology description to determine the most appropriate classification. If uncertain, note "Design not clearly specified" and provide a brief explanation of the study approach.	Descriptive study
Institutional Context	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) Look for this information in the introduction, methods, and participant description sections. If multiple institutions are involved, list all. If the geographic context is not explicitly stated, use contextual clues from the text to infer the setting.	- 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
Open Access Policy Characteristics	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)

Report

Status

Gather papers

50 papers found

Screen papers

5 papers included

Extract data

30 data points extracted

Generate report

Summarizing findings

Chat

Hang tight — you'll be able to chat with this report once it's generated

How to Conduct a Systematic Literature Review?

287

Elicit – Explore a research question



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Effects of Open-Access Policies in Higher Education

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Generate report

0:33 elapsed (5 minutes estimated)

Drafting abstract...

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

Report

Status

Gather papers

50 papers found

Screen papers

5 papers included

Extract data

30 data points extracted

Generate report

Summarizing findings

Chat

Hang tight — you'll be able to chat with this report once it's generated

Elicit – Explore a research question



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Effects of Open-Access Policies in Higher ...

Research report

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MARCH 7, 2025

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. *

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 *

Report

Status

Gather papers

50 papers found

Details

Screen papers

5 papers included

Details

Extract data

30 data points extracted

Details

Generate report

Save PDF

Chat

Ask anything about the report or its underlying data

Elicit – Explore a research question



Todas las herramientas

Editar

Convertir

Firma electrónica

Buscar texto o herramientas

Compartir

Todas las herramientas

Crear un PDF

Combinar archivos

Editar un PDF

Export a PDF

Organizar páginas

Enviar para obtener comentarios

Agregar comentarios

Rellenar y firmar

Digitalización y OCR

Proteger un PDF

Utilizar un certificado

Ver más

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:

Marcadores

Effects of Open-Access Policies in Higher Education

Results

References

1

14

^

v

↺

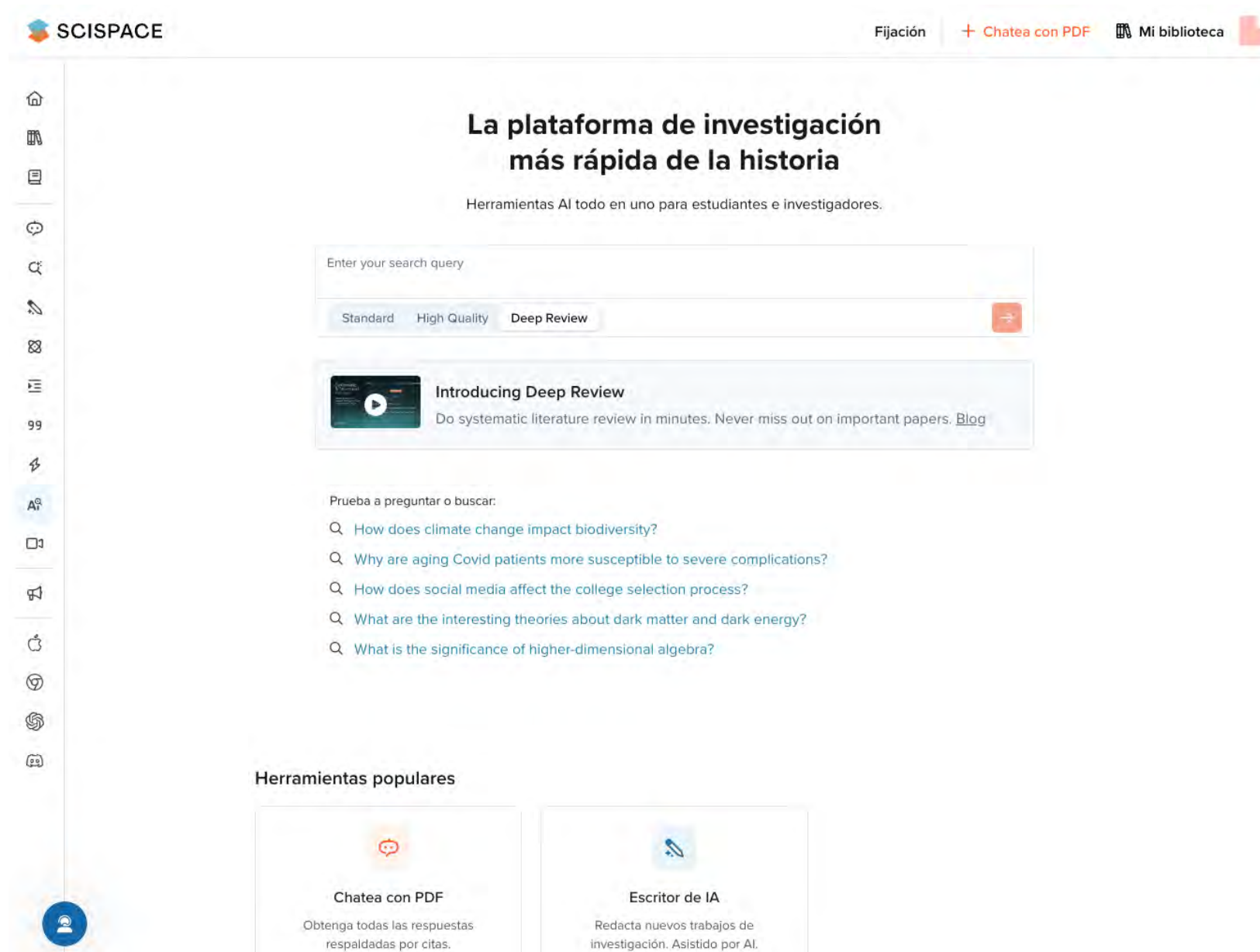
↻

📄

🔍

🔍

SCISpace



- 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



SCISPACE

Fijación + Chatea con PDF Mi biblioteca

La plataforma de investigación más rápida de la historia

Herramientas AI todo en uno para estudiantes e investigadores.

I look for insights of experiences applying open-access policies in higher education

Standard High Quality Deep Review

Prueba a preguntar o buscar:

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

Sugerencia: Si haces una pregunta, agrega un signo de interrogación (?) al final para obtener mejores resultados.

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

SCISpace – Exploring a research question



The image shows the SCISpace web interface. At the top, there's a navigation bar with the SCISPACE logo, a search bar, and links for Pricing, Chat with PDF, and My Library. Below this, a sidebar on the left contains various icons for navigation. The main content area displays a 'Research Steps' panel. The first step shows a query: 'I look for insights of experiences applying open-access policies in higher education'. A message indicates that the query has been enhanced. Below this, there's an 'Enhanced Query' section with the same query text and a 'Submit Now' button. Further down, a section titled 'To enhance the query, please consider answering the following questions:' lists two bullet points: 'Are you interested in the impact of open-access policies on students, faculty, or administrative processes within higher education?' and '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, there's a text input field for 'Enter your instructions here to enhance query' with a plus icon to its right.

SCISPACE

Papers Get insights from top papers directly

Pricing + Chat with PDF My Library

My Searches / I look for insights of experiences applying open-access policies in hi... Saved 2 secs ago

Standard High Quality Deep Review en

Research Steps

I look for insights of experiences applying open-access policies in higher education

I have enhanced the query with your inputs, you can "Submit" directly or further make changes and submit.

Enhanced Query

I look for insights of experiences applying open-access policies in higher education

Submit Now

To enhance the query, please consider answering the following 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?

Enter your instructions here to enhance query

SCISpace – Exploring a research question



The screenshot displays the SCISpace web application interface. At the top, there's a navigation bar with the SCISPACE logo, a search bar containing the text "Papers" and "Search or ask a question", and links for "Pricing", "Chat with PDF", and "My Library". Below the navigation bar, a breadcrumb trail shows "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 sequence of steps in a process. The first step is "I look for insights of experiences applying open-access policies in higher education". The second step is "I have enhanced the query with your inputs, you can 'Submit' directly or further make changes and submit." This step includes an "Enhanced Query" section with the same text as the first step. Below this, a message asks the user to consider answering two questions to enhance the query: "Are you interested in the impact of open-access policies on students, faculty, or administrative processes within higher education?" and "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?". The third step is "Run literature review for 'I look for insights of experiences applying open-access policies in higher education'". The fourth step is "Performing Steps (takes upto 3 minutes)" with a "50% Done" progress indicator. This step includes three sub-steps: "Executing multiple relevant queries to broaden the search." with a list of five queries, "Identifying filters specified in your query." with a list of two filters, and "Finding relevant papers for each query with applied filters".

SCISPACE

Papers Search or ask a question

Pricing Chat with PDF My Library

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Research Steps

I look for insights of experiences applying open-access policies in higher education

I have enhanced the query with your inputs, you can "Submit" directly or further make changes and submit.

Enhanced Query

I look for insights of experiences applying open-access policies in higher education

To enhance the query, please consider answering the following 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?

Run literature review for "I look for insights of experiences applying open-access policies in higher education"

Performing Steps (takes upto 3 minutes) 50% Done

- Executing multiple relevant queries to broaden the search.
 - 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
- Identifying filters specified in your query.
 - Open-access papers
- Finding relevant papers for each query with applied filters

SCISpace – Exploring a research question



SCISPACE

Papers ▾Get insights from top papers directly

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My Searches / Insights of experiences applying open-access policies in higher edu... Saved 3 mins ago

StandardHigh QualityDeep Reviewen ▾

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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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 & Wishnetsky, 2014).

SCISPACE

Papers ▾Get insights from top papers directly

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(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

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APA, Bullets ▾

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Mary Jo Orzech, Kim L. Myers

1 Jan 2020

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☐ 3. The Challenging State of University Campus and Library Open Access Policies

Paul J. Johnson, Ellen Dubinsky

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☐ 66

Insights

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.

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.

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

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+ TL;DR

+ Conclusions

+ Summarized Abstract

+ Results

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+ Methods Used

+ Literature Survey

+ Limitations

+ Contributions

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+ Research Gap

+ Future Research

+ Dependent Variables

+ Independent Variables

+ Dataset

+ Population Sample

+ Problem Statement

+ Challenges

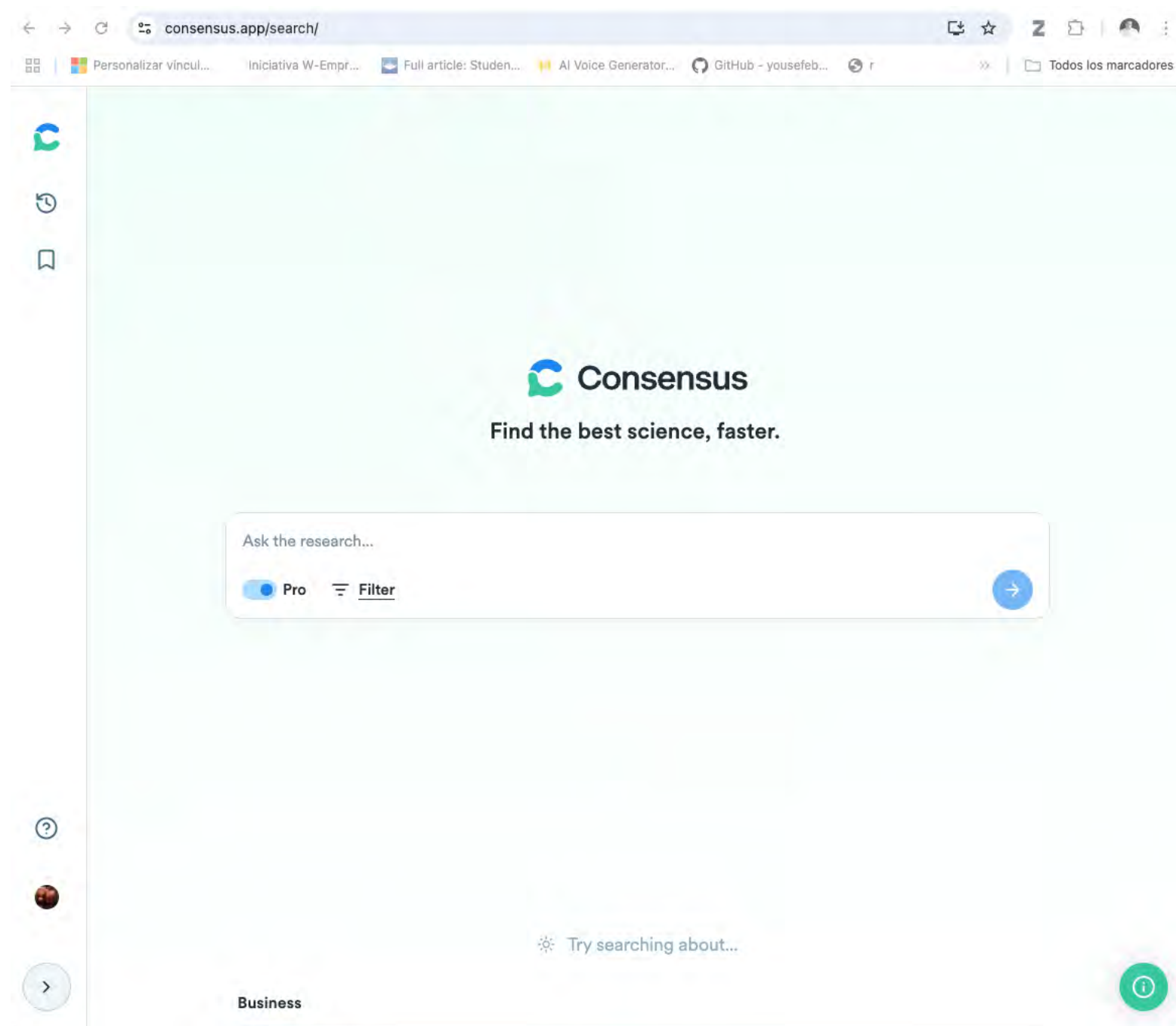
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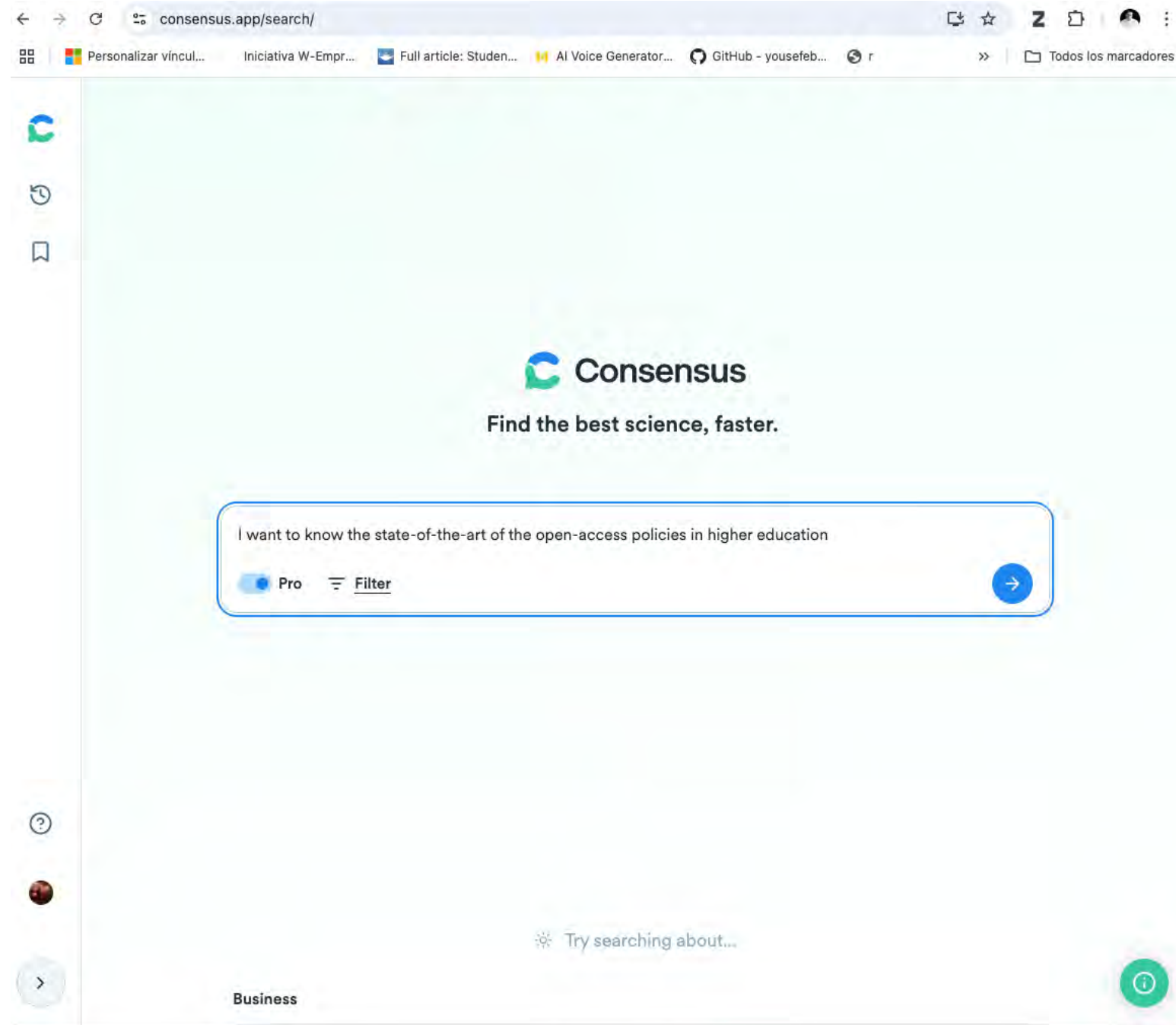
Consensus



- 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



Consensus – Exploring a research question



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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

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

Global Perspectives on Open Access Policies

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Open access policy

International Journal of Information Science and Management · M. Ghane ·

Consensus – Exploring a research question



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

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Q

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

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· *Scientometrics*

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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

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· C. Fruin et al.

· *Coll. Res. Libr.*

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3

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.

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Results

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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

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Results	Low commitment to Open Access among UAE higher education institutions.

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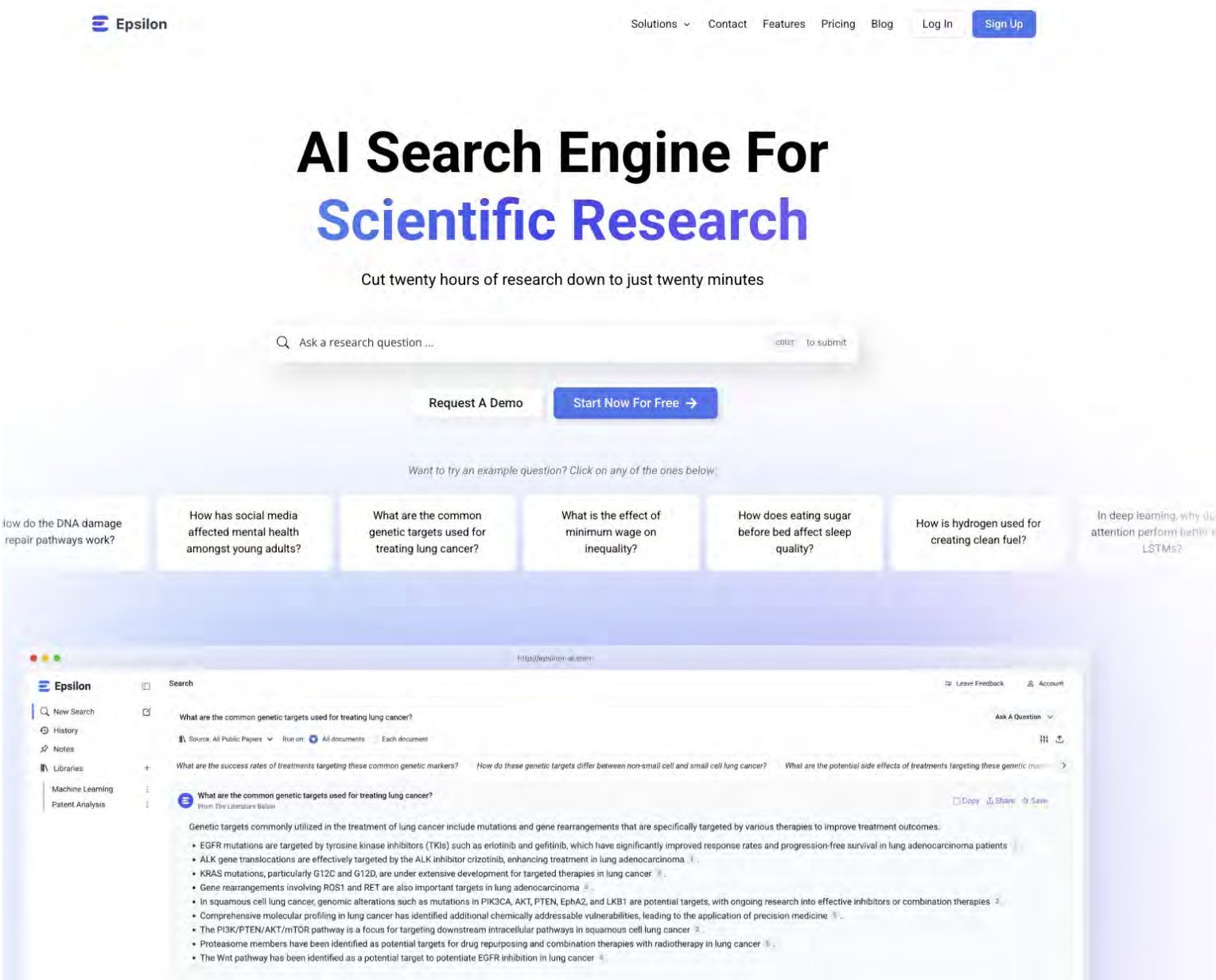
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Boufarss, M., & Laakso, M. (2020). Open Sesame? Open access priorities, incentives, and policies among higher education institutions in the United Arab Emirates. *Scientometrics*, 124, 1553-1577. <https://doi.org/10.1007/s11192-020-03529-y>.

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- Answer research questions by summarizing the passages that contain references to the sources
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- 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

Epsilon – Home



The screenshot shows the Epsilon web application interface. On the left is a sidebar with the 'Epsilon' logo and navigation links: 'New Search', 'History', 'Notes', 'Libraries' (with a sub-menu for 'My Library' and 'Connect to Zotero'), and a '+'. The main area has a 'Search' header with a trial notice and a 'Select a plan' link. Below this is a search input field and a toolbar with 'Ask A Question', 'Source: All Public Papers', 'Filters', and 'Upload' buttons. A 'Welcome to Epsilon!' section follows, explaining the tool's purpose and listing eight use cases in a bulleted list.

Epsilon

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Ask a research question ...

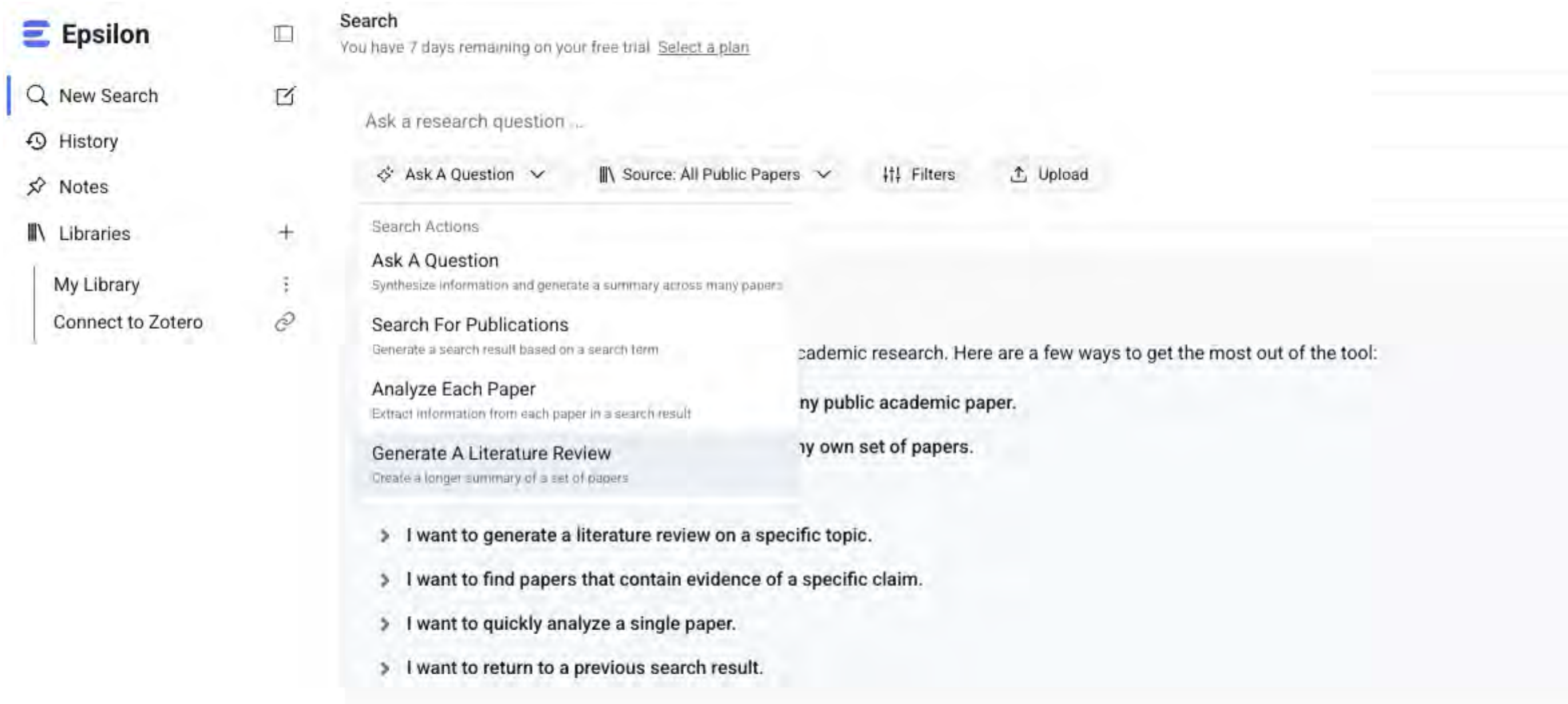
Ask A Question Source: All Public Papers Filters Upload

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 – Select “literature review”



Epsilon

Search
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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 displays the Epsilon web application interface. On the left is a sidebar with the Epsilon logo and navigation links: New Search, History, Notes, Libraries, My Library, and Connect to Zotero. The main area features a search bar with the text 'Evaluation of digital ecosystems with Artificial Intelligence integration'. Below the search bar are buttons for 'Generate A Literature Review', 'Source: All Public Papers', 'Filters', and 'Upload'. A 'Search' button is also present. Below the search bar, a 'Welcome to Epsilon!' message is displayed, followed by a list of seven use cases for the tool, each preceded by a right-pointing arrow.

Epsilon

Search
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New Search
History
Notes
Libraries
My Library
Connect to Zotero

Evaluation of digital ecosystems with Artificial Intelligence integration

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- > 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



Epsilon

New Search

History

Notes

Libraries

My Library

Connect to Zotero

Search

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Evaluation of digital ecosystems with Artificial Intelligence integration

Generate A Literature Review

Source: All Public Papers

Filters

Upload

Generated Literature Review

Using the articles below

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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, Wlsnu 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 ([Dzhanegizova, 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)

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Key Texts

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TITLE	ACTIONS
A Practical Framework for Advancing Cybersecurity, Artificial Intelligence and Technological Ecosystems to Support Regional Economic Development and Innovation 2022 · Ajayi Abisoye, Joshua Idowu Akerele	+🔍🗑️⌵
The integration of artificial intelligence in cybersecurity measures for sustainable finance platforms: An analysis 2024 · Ezekiel Onyekachukwu Udeh, Prisca Amajuoyi, Kudirat Bukola Adeusi · 37 Citations	+🔍🗑️⌵
Examination of Artificial Intelligence Integration and Impact on Higher Education 2024 · Hiba Stehman, Vincent Langer, Fardeen Mohamed · 1 Citations	+🔍🗑️⌵

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Upload

Generated Literature Review

Using the articles below

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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 ([Dzhanegizova, Nurseit et al., 2024](#)).

However, the adoption of AI also presents challenges, including ethical, methodological, and ownership concerns, particularly when leveraging big data for social transformative evaluations ([Bouyousfi, Ouédraogo et al., 2024](#)). Additionally, there is a need for a more inclusive and comprehensive research approach to understand the broader implications of AI in fields like digital media, where current studies are often fragmented ([Kakbra, 2024](#)).

Lastly, the ecological impact of AI development and implementation is a growing concern, necessitating interdisciplinary approaches to identify and mitigate environmental risks and ensure sustainable integration of AI technologies across sectors ([Zhuk, 2023](#)).

Latest Research

Recent developments in the integration of Artificial Intelligence (AI) in digital ecosystems have shown significant advancements across various sectors. In the field of digital innovation, AI has been identified as a key driver enhancing organizational readiness, technological integration, and data quality, which are crucial for fostering an innovation culture and implementing effective change management strategies ([Harfizar, Wisnu et al., 2024](#)). Additionally, the integration of AI with big data is increasingly used to analyze social transformative changes, although it faces challenges such as ethical concerns and the need for enhanced evaluator competencies in computer and data science ([Bouyousfi, Ouédraogo et al., 2024](#)).

In the realm of digital media, AI applications are revolutionizing content creation, distribution, and consumption by offering personalized content recommendations and advanced editing techniques. However, there is a noted lack of comprehensive research examining the broader implications and applications of AI in this field, which is crucial for informed decision-making and policy development ([Kakbra, 2024](#)).

Furthermore, AI's role in education, particularly in higher education, is reshaping teaching methodologies, learning experiences, and research processes. This integration, however, brings challenges related to pedagogical communication and student engagement, highlighting the need for a deeper understanding of AI's impact from the students' perspectives ([Dzhanegizova, Nurseit et al., 2024](#)).

In cybersecurity, a practical framework has been proposed to enhance the synergy between AI, cybersecurity, and technological ecosystems, aiming to create a robust foundation for regional economic growth and innovation. This framework emphasizes the importance of secure digital infrastructures and AI-driven solutions in optimizing resource allocation and improving decision-making ([Abisoye, Akerele et al., 2022](#)).

Lastly, the ecological costs associated with AI development are being scrutinized to ensure its sustainable integration across various economic sectors, focusing on identifying moral-ethical and political-legal strategies to mitigate environmental inequalities and risks associated with AI technologies ([Zhuk, 2023](#)).

Challenges, Open Questions, & Opportunities

The integration of Artificial Intelligence (AI) into digital ecosystems presents a complex landscape of challenges, open questions, and opportunities. Major challenges include ethical concerns, methodological issues, and the management of data ownership ([Bouyousfi, Ouédraogo et al., 2024](#)), while opportunities arise in enhancing innovation, efficiency, and engagement across various sectors.

Opportunities:

- Innovation Enhancement: AI drives significant improvements in process efficiency, product quality, and service creativity, fostering an innovation culture within organizations ([Harfizar, Wisnu et al., 2024](#)).
- Efficiency in Digital Media: AI applications in digital media enhance content personalization and media production processes, revolutionizing interaction and consumption patterns ([Kakbra, 2024](#)).
- Educational Transformation: AI influences teaching methodologies and learning experiences in higher education, potentially improving pedagogical communication and student engagement ([Dzhanegizova, Nurseit et al., 2024](#)).
- Economic Development: The synergy between AI, cybersecurity, and technological ecosystems is pivotal in driving regional economic growth and innovation ([Abisoye, Akerele et al., 2022](#)).
- Consumer Engagement: AI and related technologies transform marketing strategies and consumer relations, enhancing brand engagement and value creation ([Marrone, Testa et al., 2022](#)).

Methodologies

Various methodologies are employed to study the integration of Artificial Intelligence (AI) in digital ecosystems. One common approach is the use of statistical tools such as the SmartPLS approach to analyze the influence of AI on digital innovation, as demonstrated by Harfizar, Wisnu et al. (2024). Systematic literature reviews are also prevalent, used to assess the impact of AI across different sectors, including digital media and evaluation fields, as seen in the studies by Bouyousfi, Ouédraogo et al. (2024) and Kakbra (2024). Additionally, interdisciplinary and political-legal analyses are utilized to explore ecological costs associated with AI technologies, as highlighted by Zhuk (2023). Moreover, comprehensive questionnaires are employed to gather perceptions and attitudes towards AI's role in specific ecosystems like education, as conducted by Dzhanegizova, Nurseit et al. (2024). These methodologies collectively contribute to a deeper understanding of AI's integration and its multifaceted impacts on digital ecosystems.

Epsilon – Result: reference list



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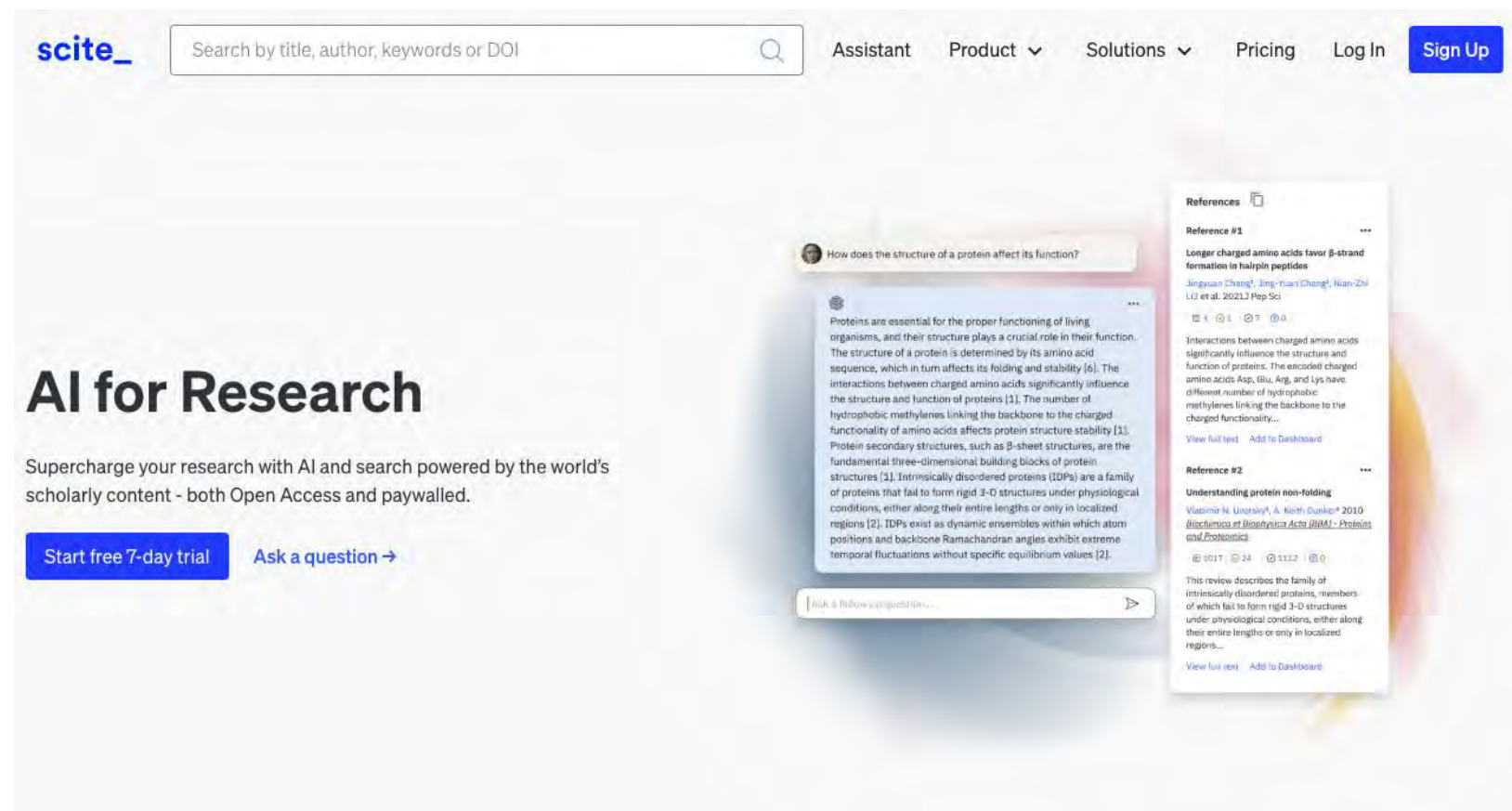
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Examination of Artificial Intelligence Integration and Impact on Higher Education 2024 · Hala Strohmiet, Vincent Langner, Fardeen Mohamed · 1 Citations	
Frameworks for procurement, integration, monitoring, and evaluation of artificial intelligence tools in clinical settings: A systematic review 2024 · Sarim Dawar Khan, Z. Hoodbhoy, M. Raja · 2 Citations	
ARTIFICIAL INTELLIGENCE INTEGRATION ASSESSMENT IN BANKS THROUGH FINANCIAL REPORTING: CASE STUDY OF ARMENIA 2024 · Henrik H. Manukyan, Suren H. Parsyan	
Utilizing digital story writing as a pedagogical approach to foster Artificial Intelligence (AI) literacy in students 2024 · Dzul Rachman, Khushul Khatimah, Taghfirul Azhima Yoga Siswa	
A Comprehensive Evaluation of Fake Face Recognition Scheme using Artificial Intelligence Oriented Learning Scheme 2024 · S. Subashree, Remya Rose S, A. S. Valarmathy	
Analyzing the Influence of Artificial Intelligence on Digital Innovation: A SmartPLS Approach 2024 · Harfizar, Muhammad Wisnu, Miftah Wicaksono · 35 Citations	
Evaluation Planning for Artificial Intelligence-based Industry 6.0 Metaverse Integration 2023 · Janne Heikälä, Khushboo Singh · 6 Citations	
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Artificial intelligence and big data-driven evaluation research and practices: A systematic literature review 2024 · S. E. Bouyoussi, Miché Ouedraogo	
Influential factors of Artificial Intelligence (AI) in the digital transformation of the human resources recruitment process sector in Vietnam 2024 · Bui Quoc Khoa, Nguyễn Văn Toai, Do Thị Thu Hien · 1 Citations	
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A review of digital twins and their application in cybersecurity based on artificial intelligence 2024 · Mohámmad-Hossein Hómaei, Oscar Mogóllon-Gutiérrez, José Carlos Sancho · 6 Citations	
Implications of Artificial Intelligence (AI) in Education: A Critical Review, Evaluation, and Conceptualization 2024 · P. Christou	
Fusion of Augmented Reality and Artificial Intelligence A MOORA-Based Evaluation of AR Technologies 2024	
Integration of Artificial Intelligence for educational excellence and innovation in higher education institutions 2024 · A. Murden, Roshan Halikhorae · 4 Citations	



- Analyze citations not only for their quality, but also for their context
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- It allows you to explore the literature not only through direct searches, but also by exploring the articles cited in a document
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Scite Assistant usage example



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Ask simple questions and get reliable answers from the full-text of millions of research articles.

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"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:

assistant by scite_

Give me five key references about chatgpt in education

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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:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

Give me five key references about chatgpt in education

1

What do you need help with?

References

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 Eguaras¹, Raquel Chocarro Eguaras², Mónica Cortiñas Ugalde³ et al. 2021 *Educational Studies*

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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.

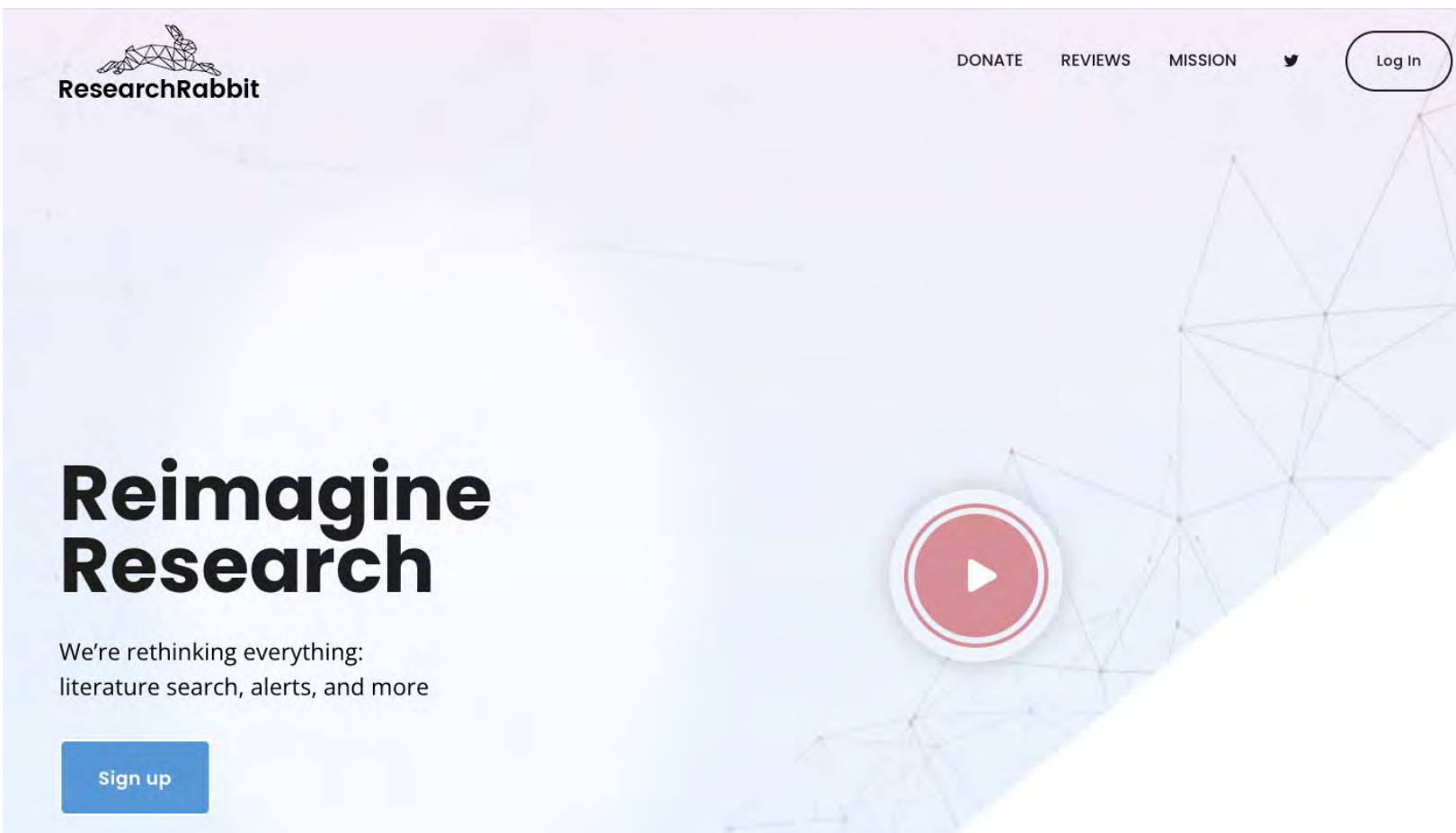
Reference # 2

"...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. ChatGTP was trained by a model using reinforcement learning from human feedback, using the same methods as InstructGPT (GPT: generative pre-trained transformer) [2]...."

How to Conduct a Systematic Literature Review?

311

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

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FilterCustomAbstractsCommentsSelect NoneSelect AllUntitled CollectionGarcía-Peñalvo2022Desarrollo de estados de la cuestión robustos: Revisiones Sistemáticas de LiteraturaEducation in the Knowledge SocietyPDFAdd Papers

1 Selected PaperFrancisco José García-PeñalvoDesarrollo de estados de la cuestión robustos: Revisiones Sistemáticas de LiteraturaEducation in the Knowledge Society2022La revisión sistemática de literatura es un método sistemático para identificar, evaluar e interpretar el trabajo de académicos y profesionales en un campo elegido. Su propósito es identificar lagunas en el conocimiento y necesidades de investigación en un campo concreto. Las revisiones sistemáticas conforman una familia amplia de métodos y aproximaciones y resultan totalmente necesarias por el volumen tan enorme de producción científica en formato digital al que se tiene potencialmente acceso. Sin embargo, no es suficiente con adjetivar una revisión como sistemática. El objetivo de este artículo es presentar las diferentes fases que se deben llevar a cabo cuando se realiza una revisión sistemática. Se comienza con la introducción de los marcos metodológicos de referencia para la realización de revisiones sistemáticas, para, a continuación, profundizar en las fases de planificación, realización e informe de la revisión sistemática. De modo que todo artículo que lleve este marbete (revisión sistemática de literatura) además de cumplir unos principios metodológicos y de transparencia, permita que cualquier investigador pueda no solo confiar en las conclusiones derivadas del trabajo, sino evolucionar la revisión sistemática realizada para atacar el problema derivado de la obsolescencia y el continuo avance del conocimiento científico, en consonancia con el modelo de datos FAIR, es decir, que se cumplen con los principios de encontrabilidad, accesibilidad, interoperabilidad y reutilización. Este artículo se ha escrito en español y en inglés.

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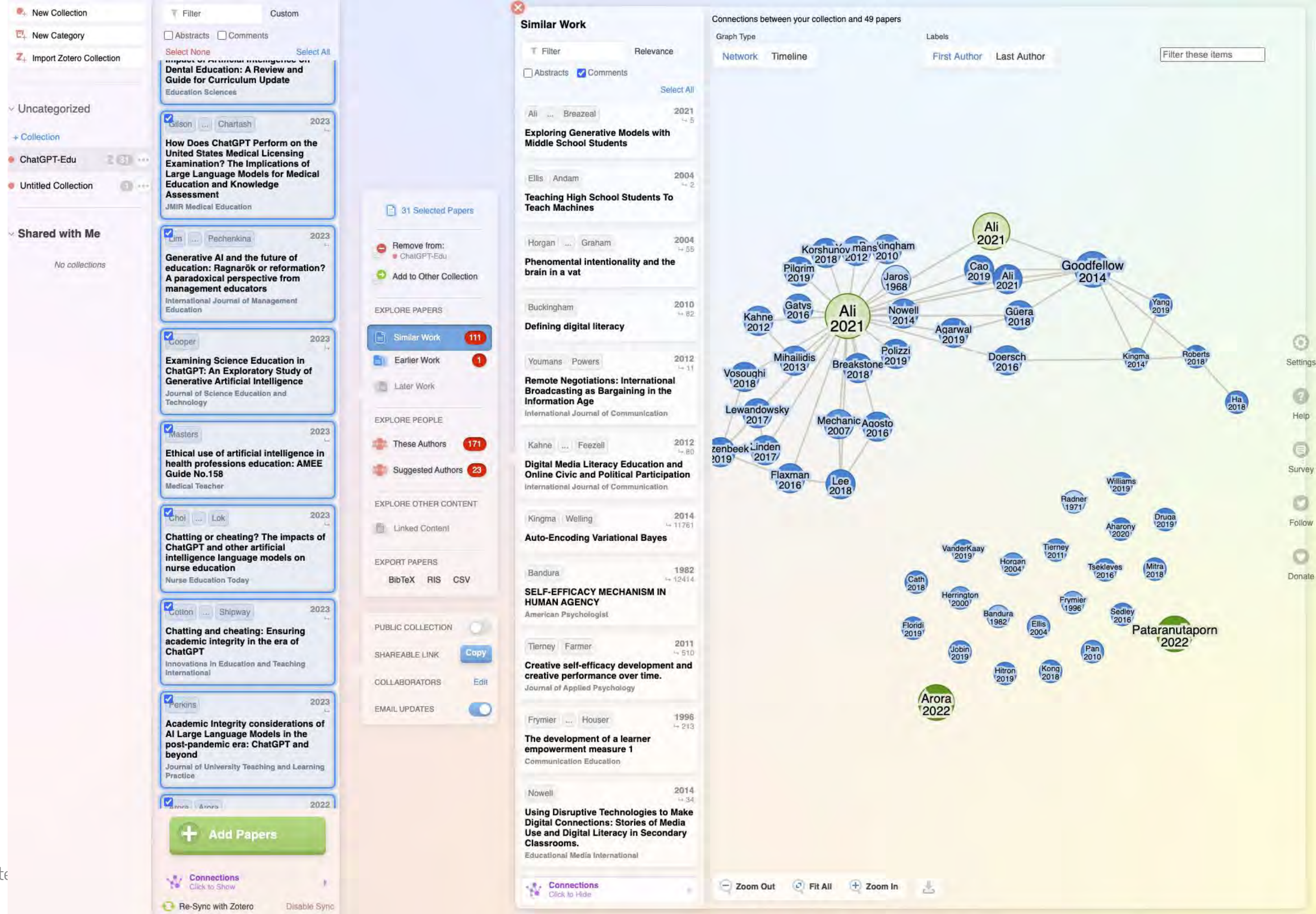
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How to Conduct a Systematic Literature Review?

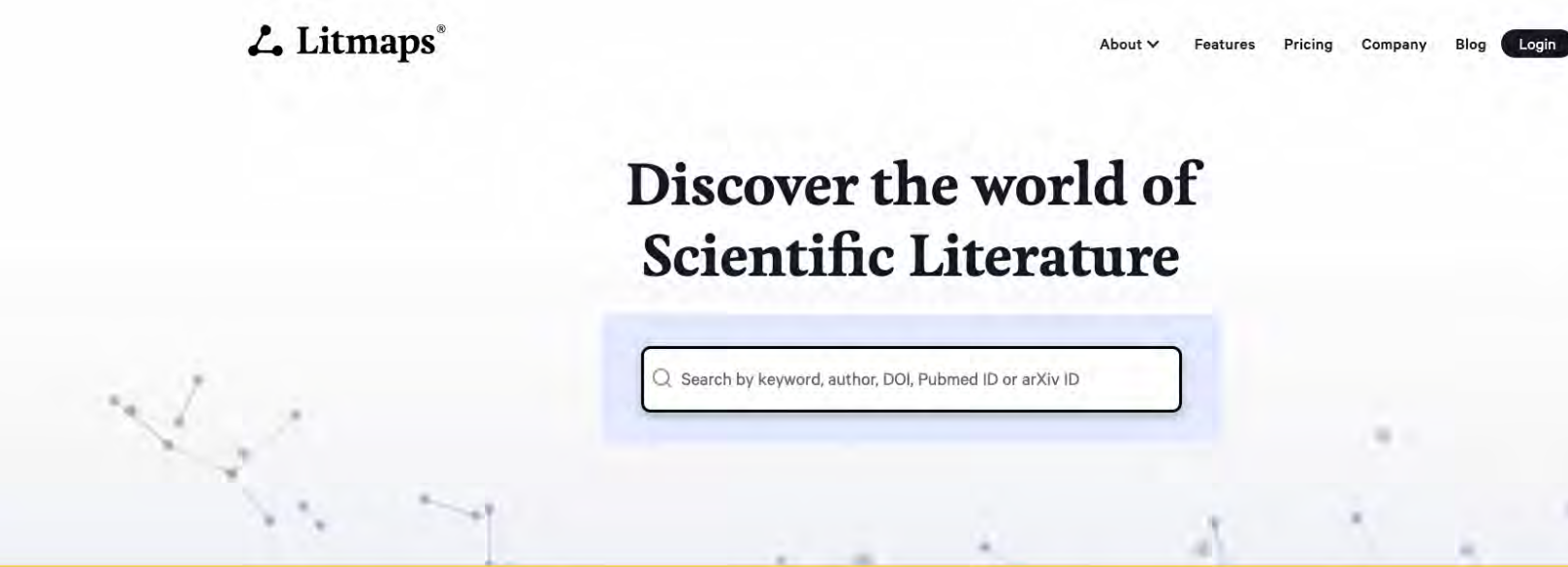
313

Example of using ResearchRabbit from a Zotero collection as a seed

How to Conduct a Systematic Literature Review



Litmaps



- Allows you to discover academic scientific articles
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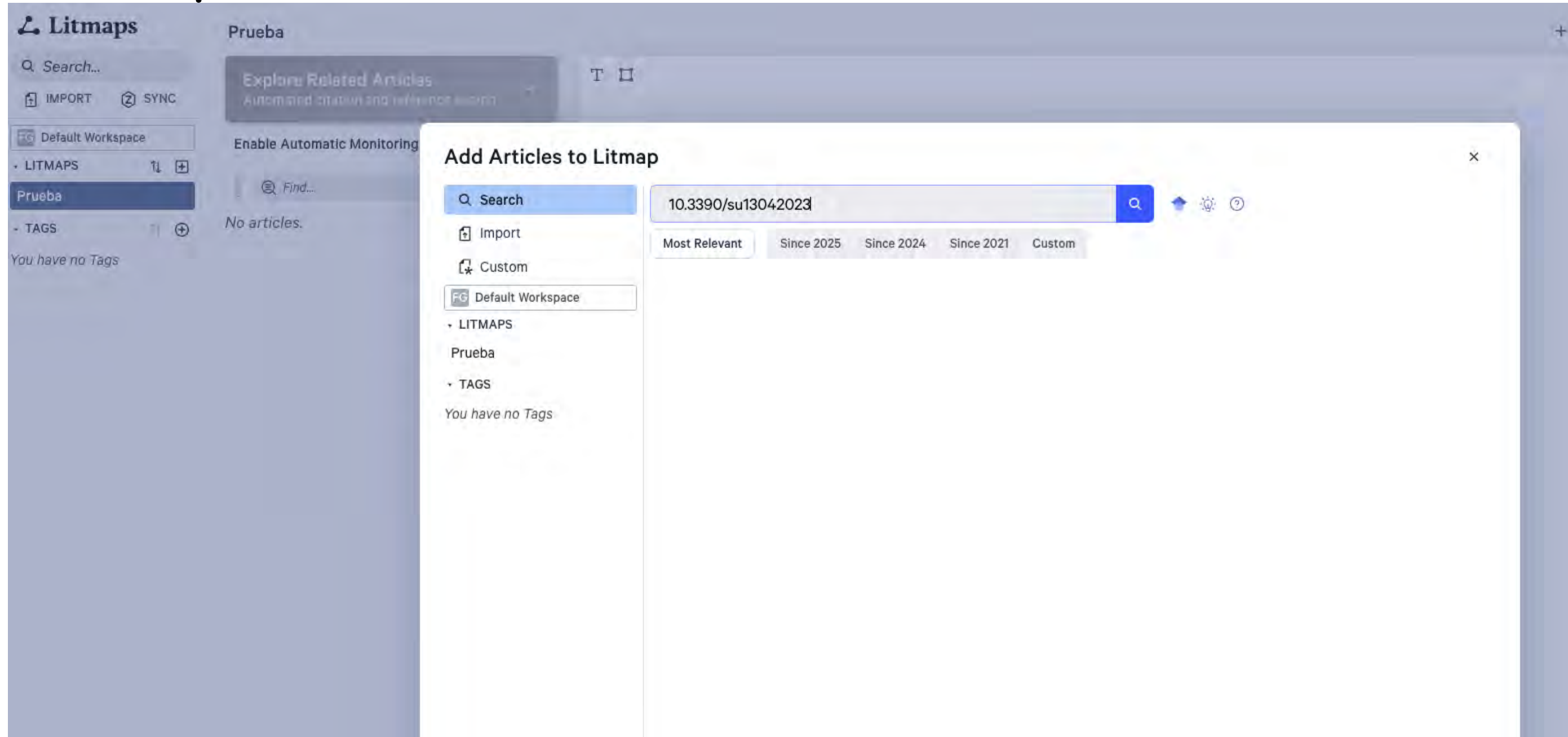
Litmaps are visual collections of articles that help you explore related articles and understand how research is connected.

Prueba

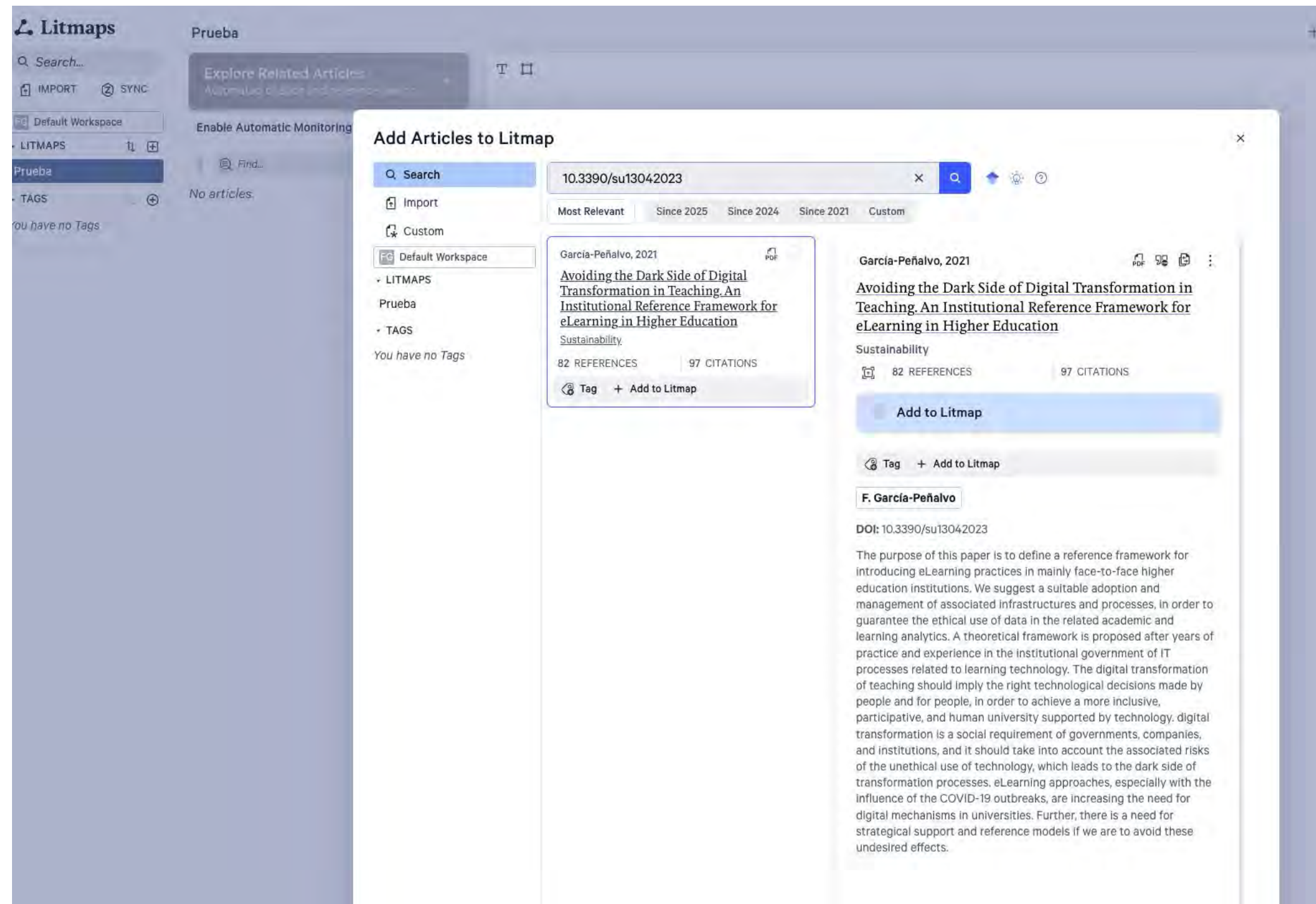
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The background image shows the Litmaps interface with a network diagram of research articles. The diagram consists of several nodes (circles) connected by lines, representing relationships between different studies. The nodes are labeled with author names and years, such as "Chae 1984", "Wood 2002", "Perkins 2016", "Rhee 2017", "Loew 1980", "Soto 2010", "Karpus 2015", "Jiang 2024", "Chawla 2023", "Chou 2023", "Wang 2023", "Collu 2022", "Mylascher 2017", and "Zhao 2014". The interface also includes a search bar, a sidebar with "LITMAPS" and "TAGS" sections, and a "Create a Litmap" dialog box in the foreground.

Litmaps



Litmaps



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García-Peñalvo, 2021

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

Sustainability

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Done

García-Peñalvo, 2021

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

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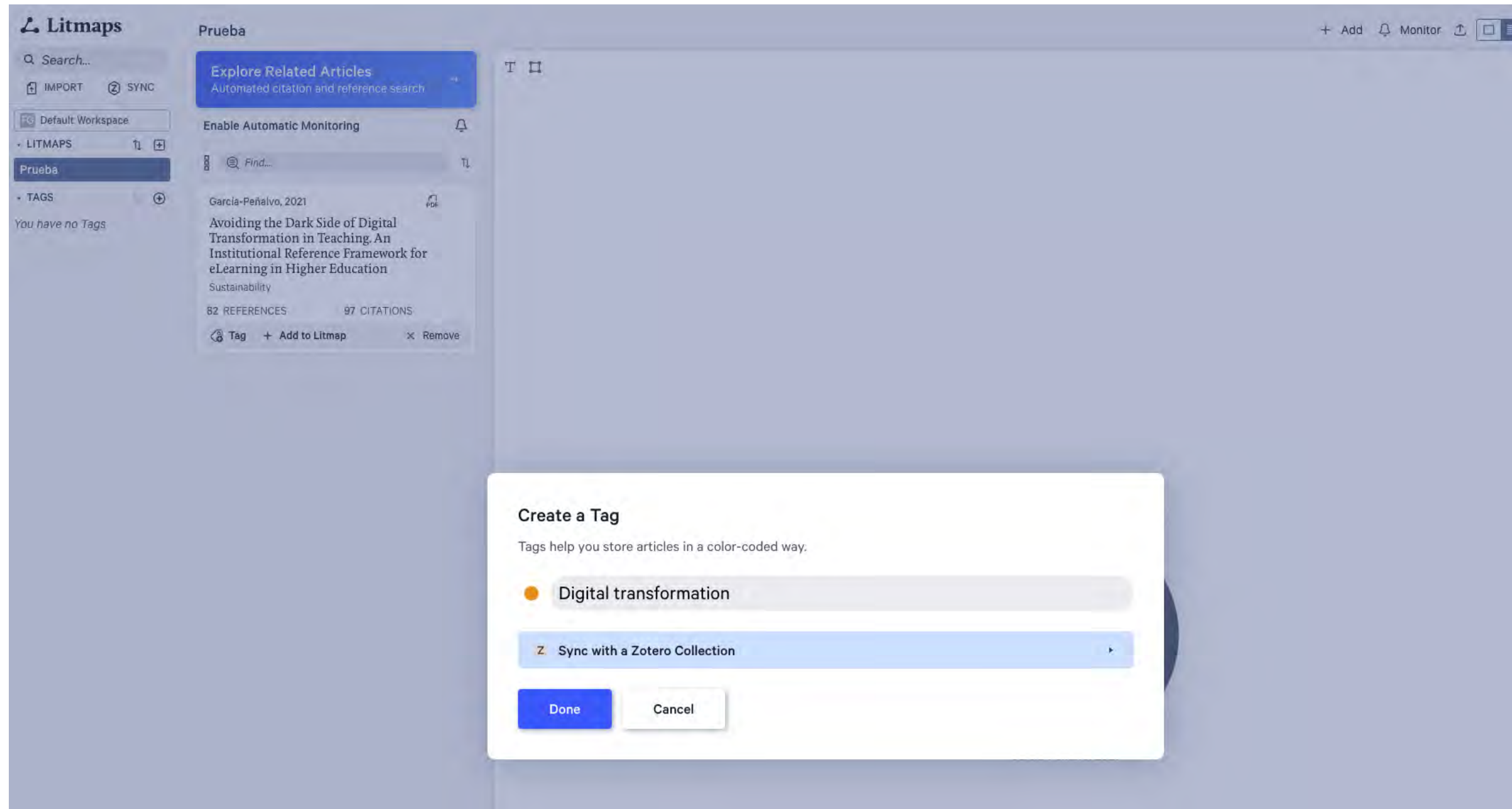
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F. García-Peñalvo

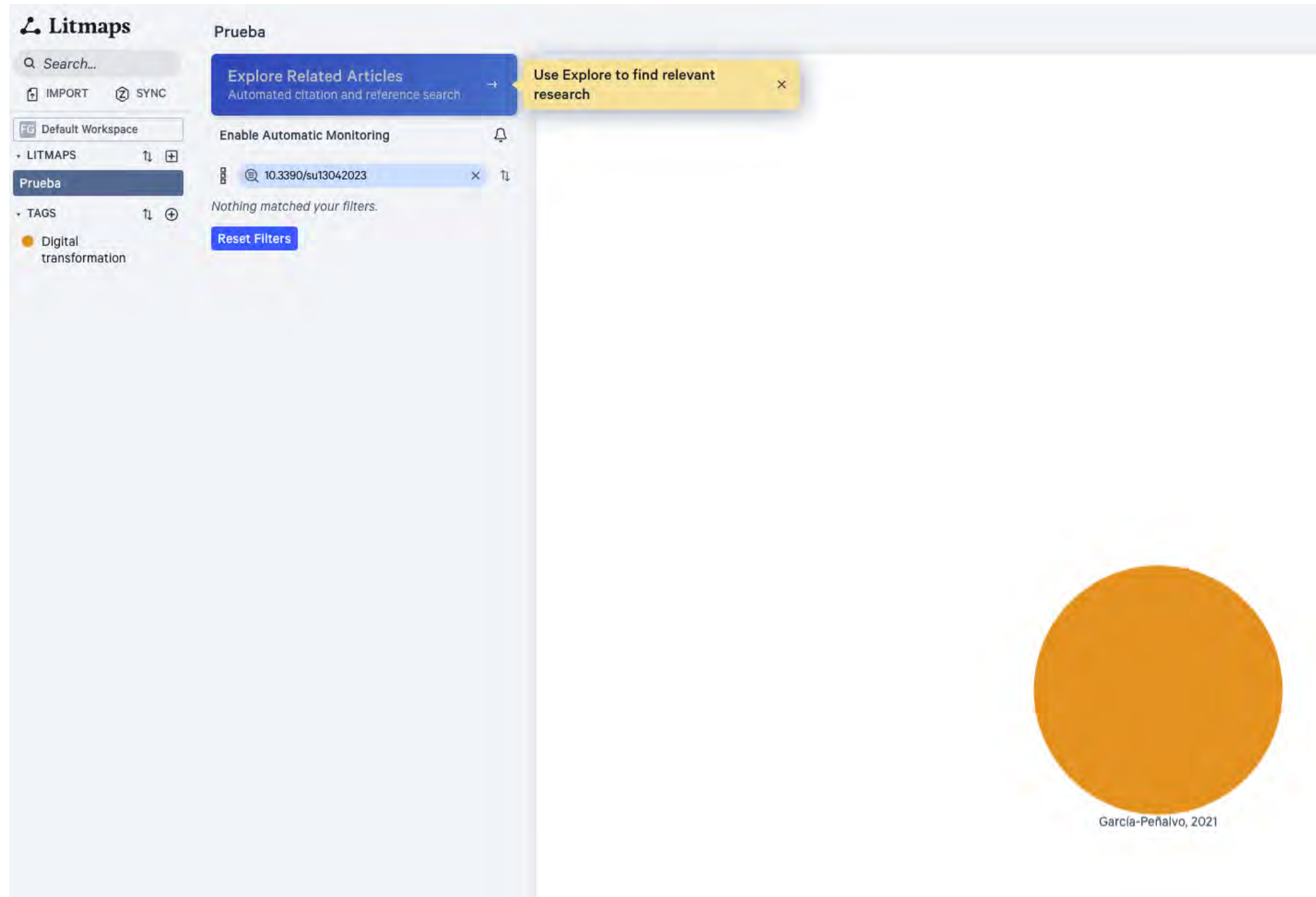
DOI: 10.3390/su13042023

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.

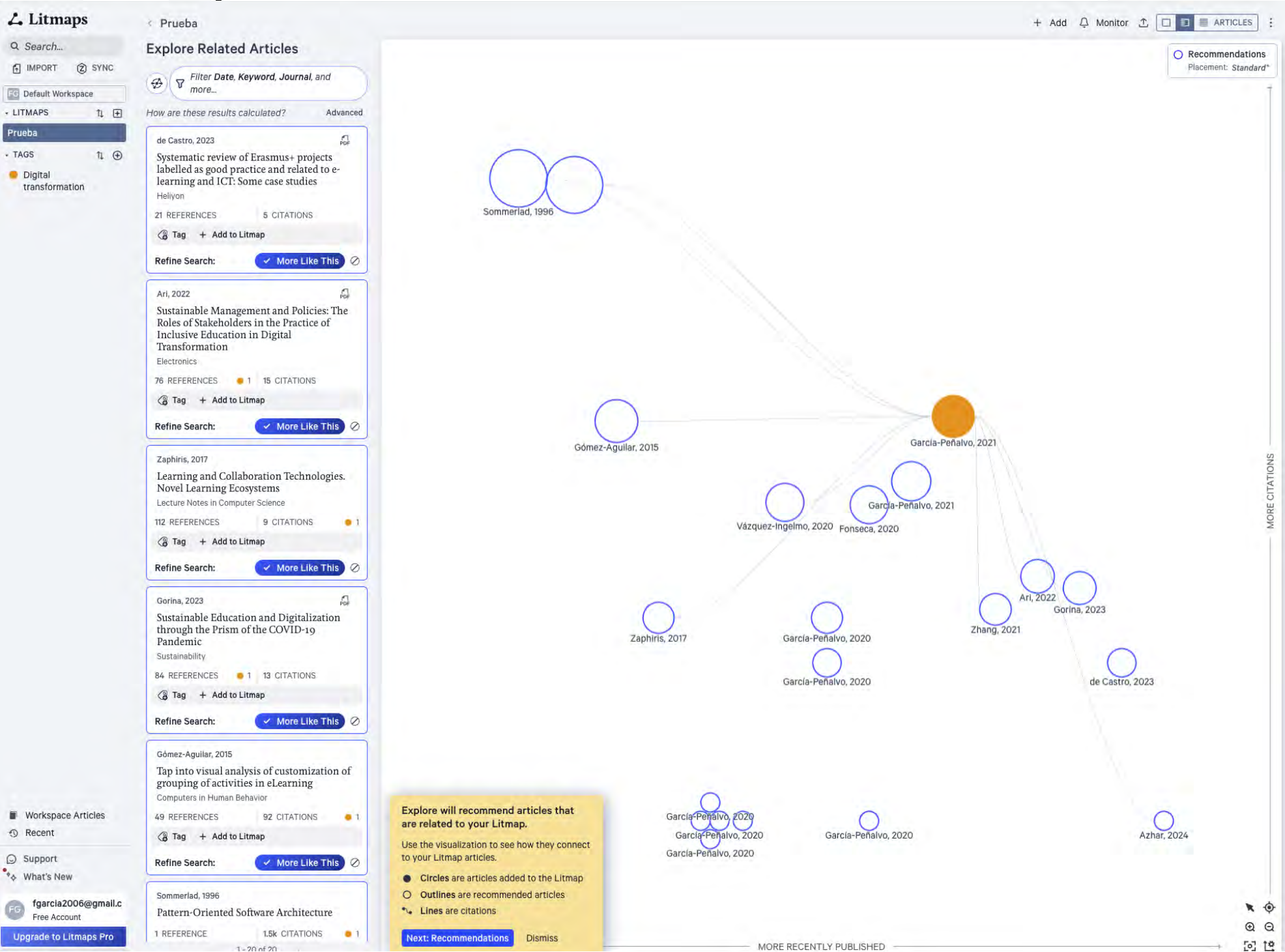
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Digital transformation

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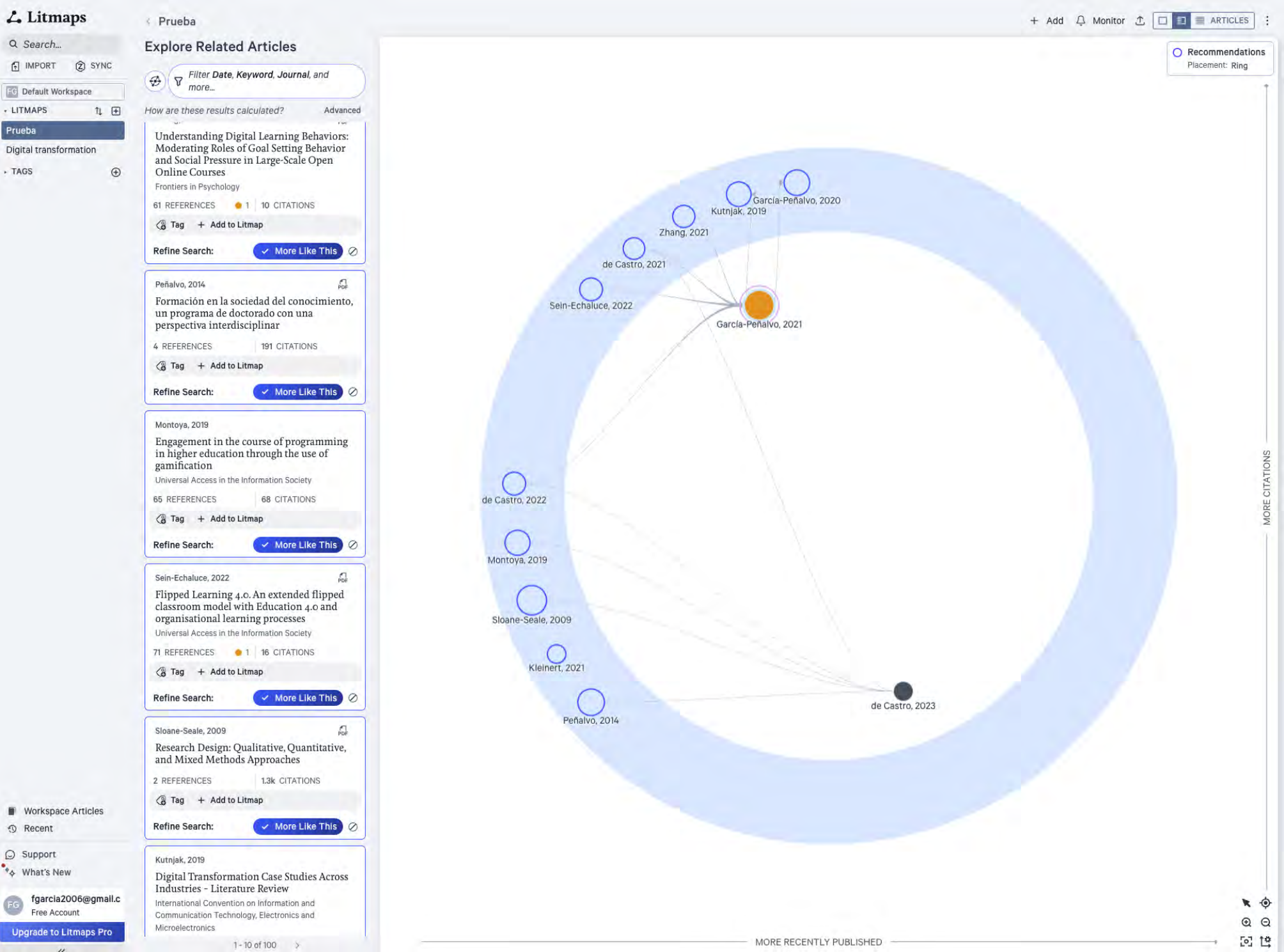
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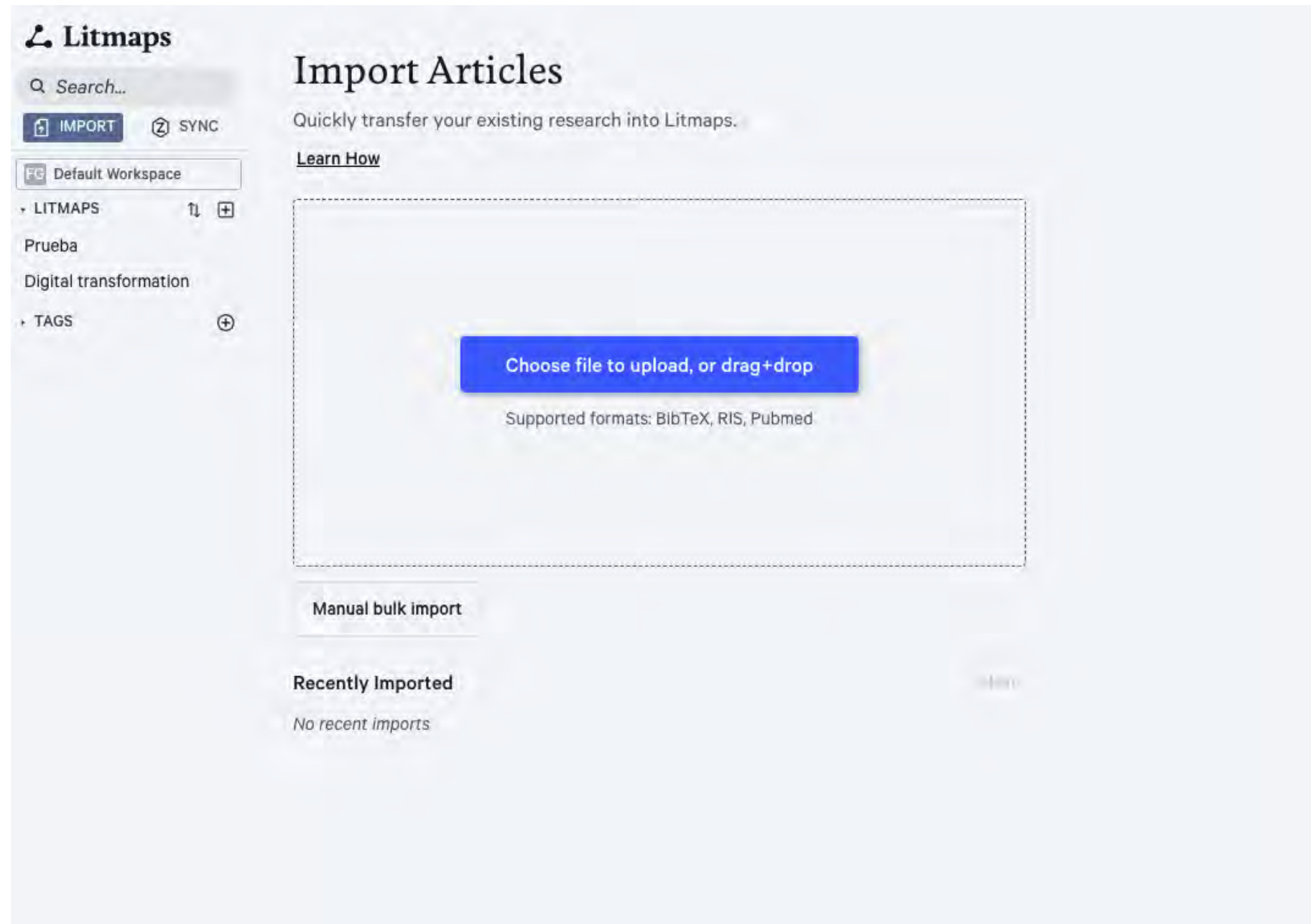
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Litmaps



Litmaps



Litmaps



The screenshot shows the Litmaps web application 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 description, a 'Learn How' link, a large dashed box for file upload with a blue button and supported format text, a 'Manual bulk import' button, and a 'Recently Imported' list showing a file named 'ChatGPT-Educación.ris' imported 3 minutes ago. A 'Clear' button is also present.

Litmaps



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Ali, 2021

What are GANs?: Introducing Generative Adversarial Networks to Middle School Students

AAAI Conference on Artificial Intelligence

16 REFERENCES23 CITATIONS

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Generative adversarial networks and synthetic patient data: current challenges and future perspectives

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IFAC Symposium on Advances in Control Education

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Thorp, 2023

ChatGPT is fun, but not an author

Science

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Karaali, 2023

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What are GANs?: Introducing Generative Adversarial Networks to Middle School Students

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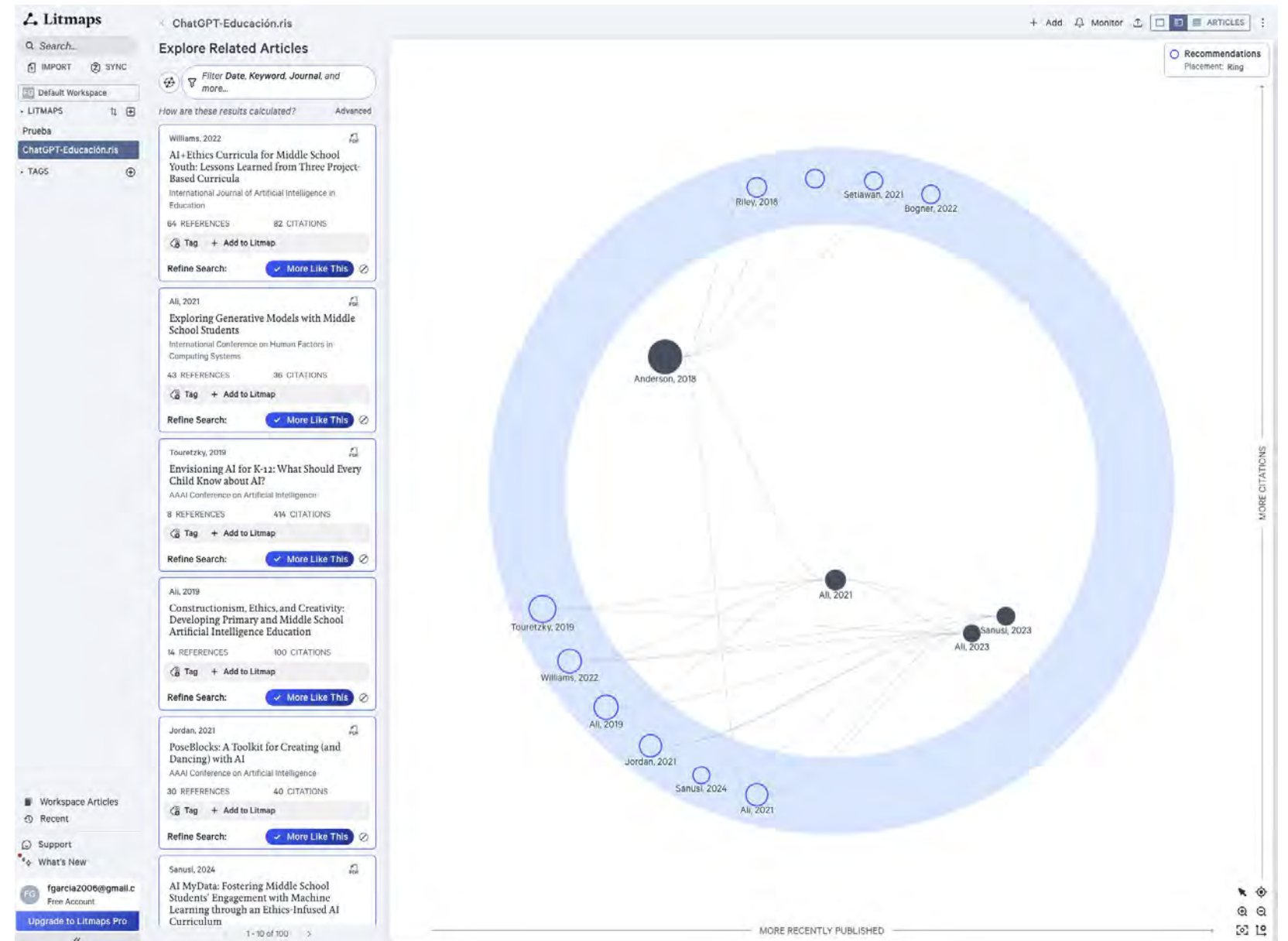
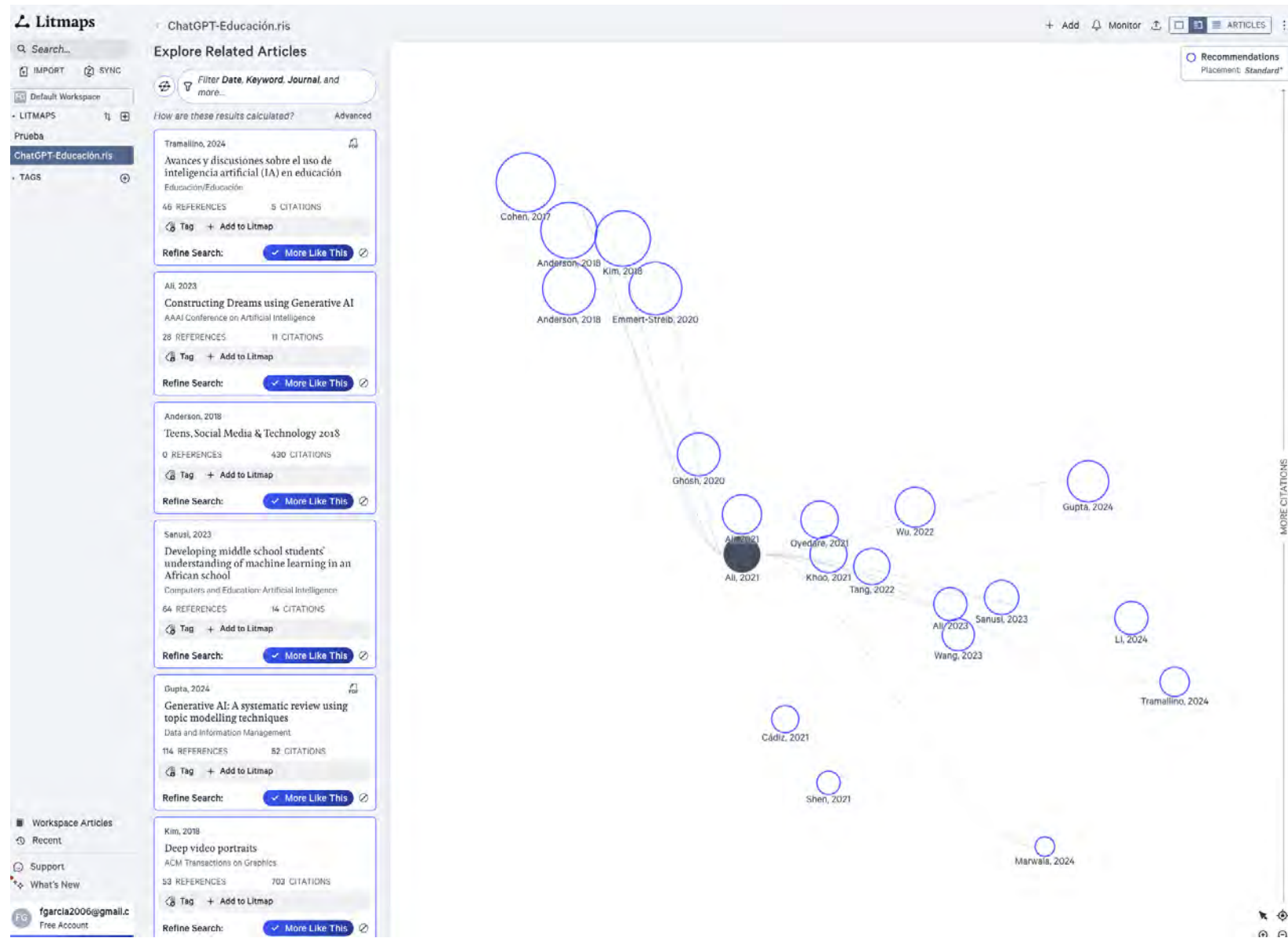
TagAdd to Litmap

Safinah Ali+1...C. Breazeal

DOI: 10.1609/aaai.v35i17.17821

Applications of Generative Machine Learning techniques such as Generative Adversarial Networks (GANs) are used to generate new instances of images, music, text, and videos. While GANs have now become commonplace on social media, a part of children's lives, and have considerable ethical implications, existing K-12 AI education curricula do not include generative AI. We present a new module, "What are GANs?", that teaches middle school students how GANs work and how they can create media using GANs. We developed an online, team-based game to simulate how GANs work. Students also interacted with up to four web tools that apply GANs to generate media. This module was piloted with 72 middle school students in a series of online workshops. We provide insight into student usage, understanding, and attitudes towards this lesson. Finally, we give suggestions for integrating this lesson into AI education curricula.

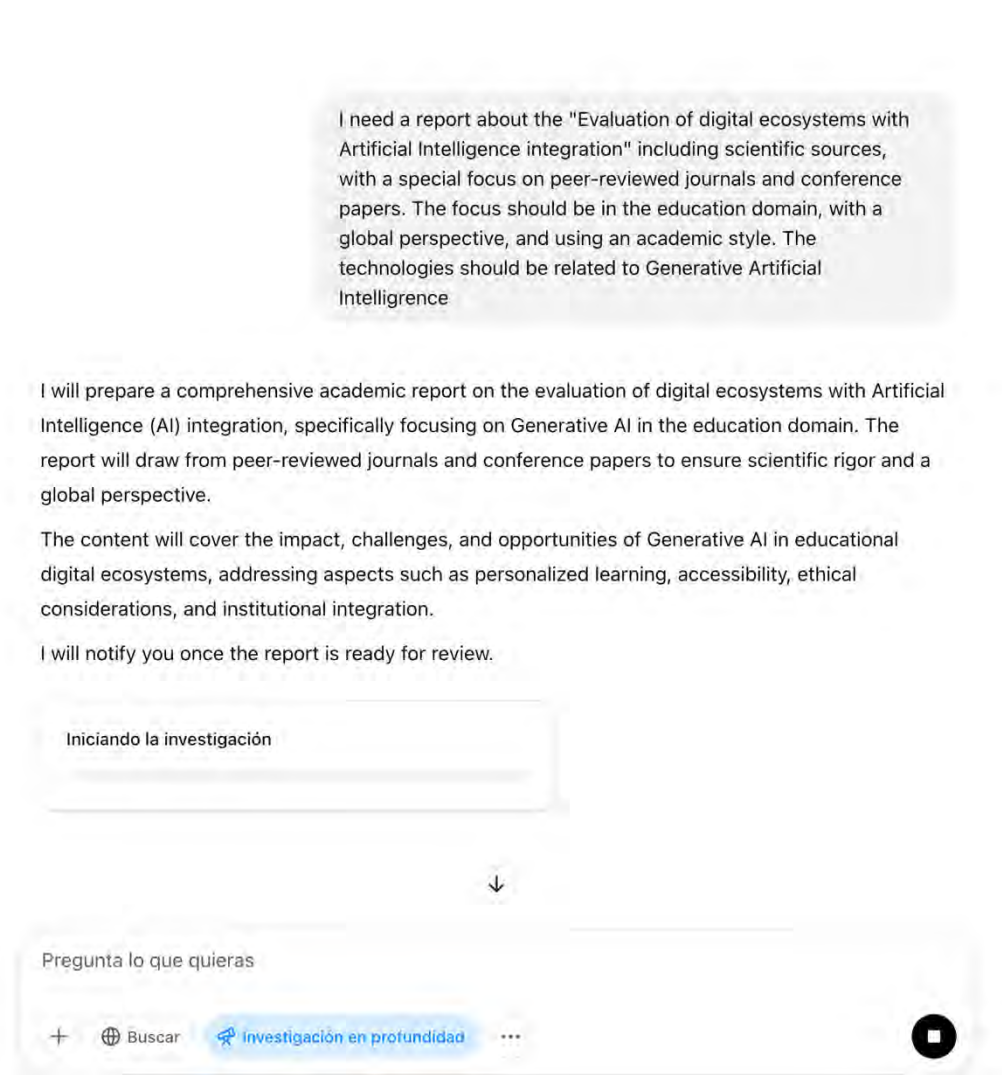
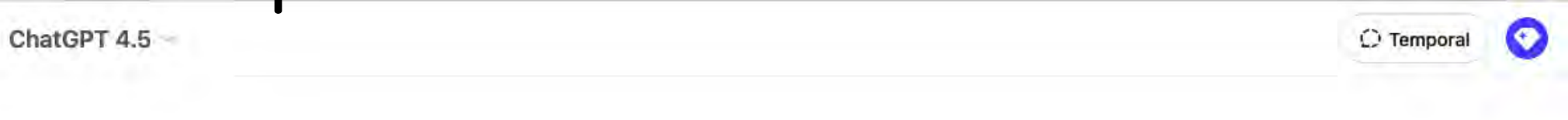
Litmaps



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



Deep research with ChatGPT



ChatGPT

Sora

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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

Piano alturas edificios

Conducción impulso nervioso

ChatGPT 4.5

Compartir

Actividad

2 fuentes

X

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.

Revisando artículos académicos

2 fuentes

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.

Evaluation of Digital Ecosystems with AI Integration in Education

Estoy revisando citas en formato especial con herramienta de navegación. Necesito abordar avances, beneficios, desafíos y casos de estudio en la educación utilizando IA generativa.

Asignando tareas concretas
Buscaré informes de UNESCO y revistas académicas internacionales; exploraré conferencias como AAAI y AIED. Esta estrategia me guiará en la búsqueda de literatura global.

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.aladinhe.ac.uk](#)

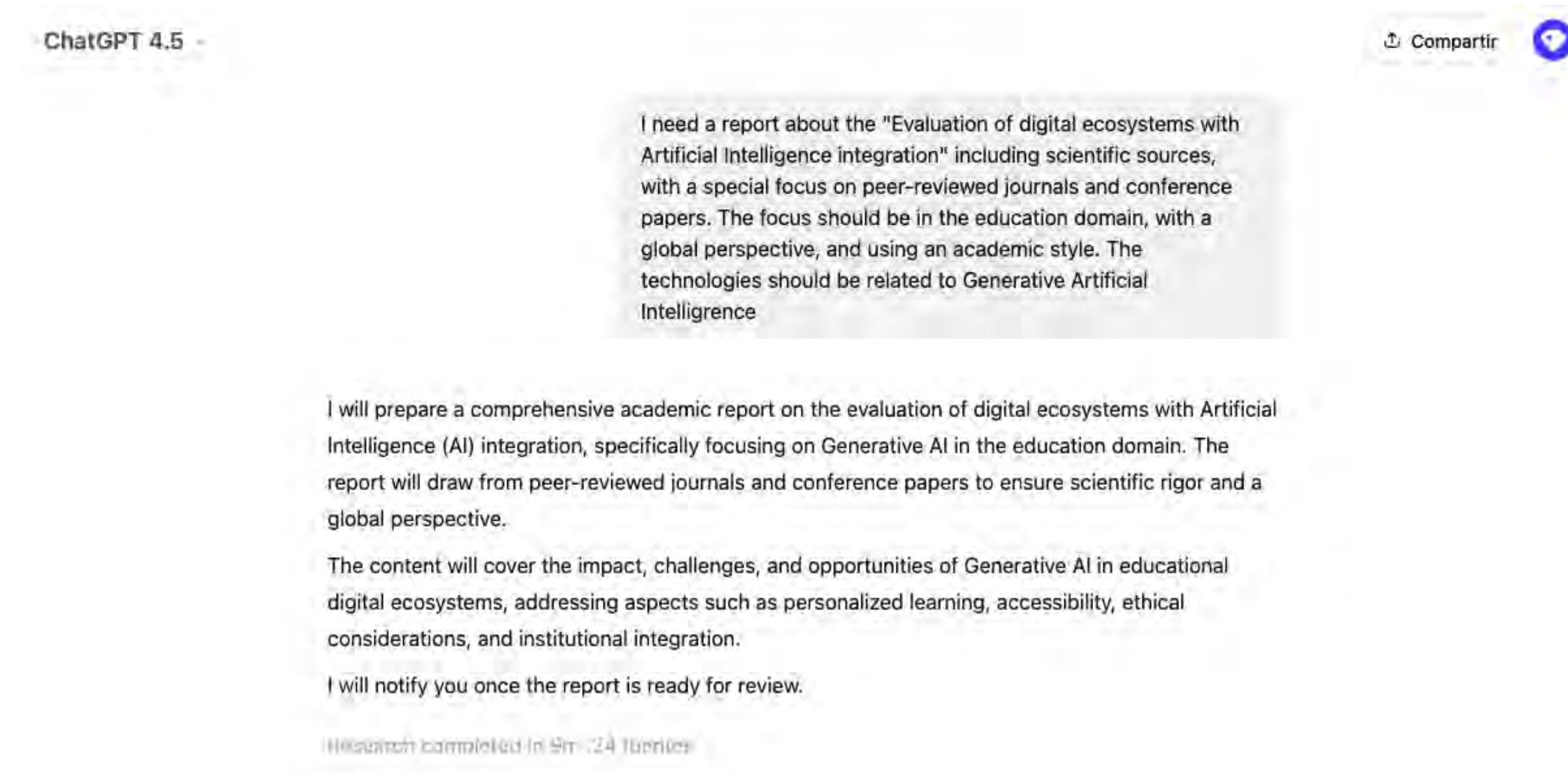
Estoy revisando la accesibilidad del enlace, sugiriendo buscar "Generative AI in higher education ALDinHE" para encontrarlo.

Peregrinando nuevos caminos.

Buscando inteligencia artificial generativa en educación superior

Estoy revisando un PDF y menciones sobre IA generativa en educación, asegurando una

Deep research with ChatGPT



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 impacto en tiempo real.

Leyó de [ed.gov](#)

Estoy pensando en cómo puede adaptar el contenido generativo a los problemas de los estudiantes en tiempo real.

Leyó de [weforum.org](#)

Estoy pensando en la inclusión de idiomas diversos y de género, promoviendo la equidad en el acceso a la tecnología. Estoy pensando en técnicas de probabilidad en un modelo de herramientas de mediación.

Evaluation of AI-Integrated Digital Learning Ecosystems: The Role of Generative AI

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ChatGPT is an emerging technology that provides educational researchers with the ...

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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.

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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

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4. Impact of Generative AI on Educational Digital Ecosystems

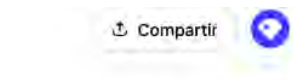
Personalized Learning and Adaptive Education: Generative AI has a strong potential to advance personalized learning within digital ecosystems. Adaptivity – the ability to adjust to individual learners – is regarded as a key benefit of AI in education ^{ED.GOV}. In practice, generative AI tutors (like 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 ^{CEEDTECH.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 ^{DIGITALCOMMONS.USC.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 ^{DIGITALCOMMONS.USC.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.

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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

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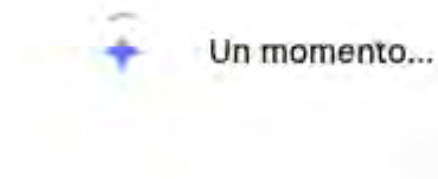
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I want to explore the Generative Artificial Intelligence risks from different perspectives (social, ethics, privacy, security, economics, technology, etc.), including...

✦ 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](#)



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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

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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.

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Start research

Great. While I'm researching, feel free to leave this chat. I'll let you know as soon as I'm done.

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🌐 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...

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lfaidata.foundation Respo...

ainowinstitute.org ainowin...

www2.deloitte.com How c...

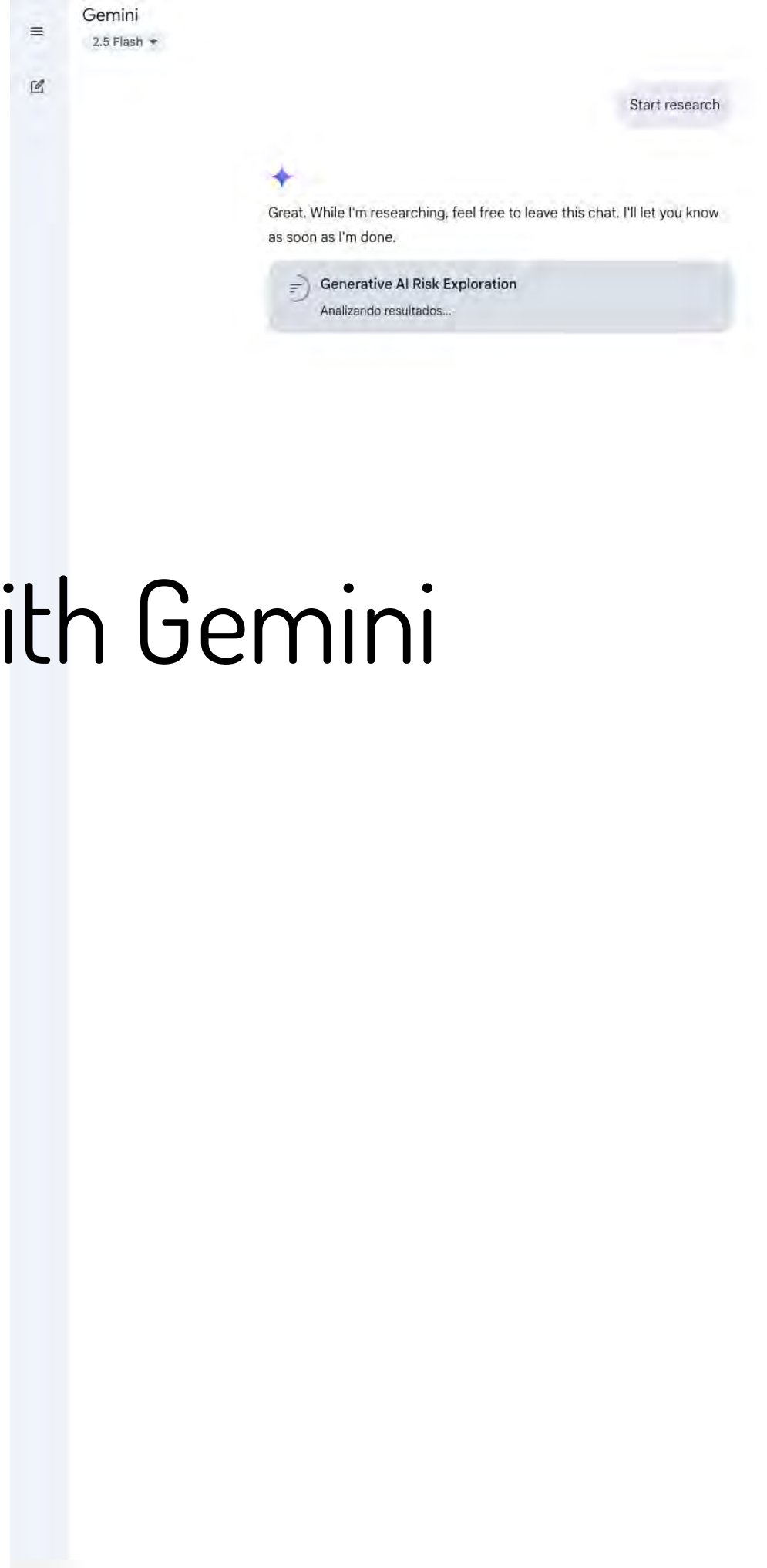
oecd.ai Generative AI: the ...

oecd.org AI principles - O...

wiz.io NIST AI Risk Manage...

hyperproof.io NIST AI Risk ...

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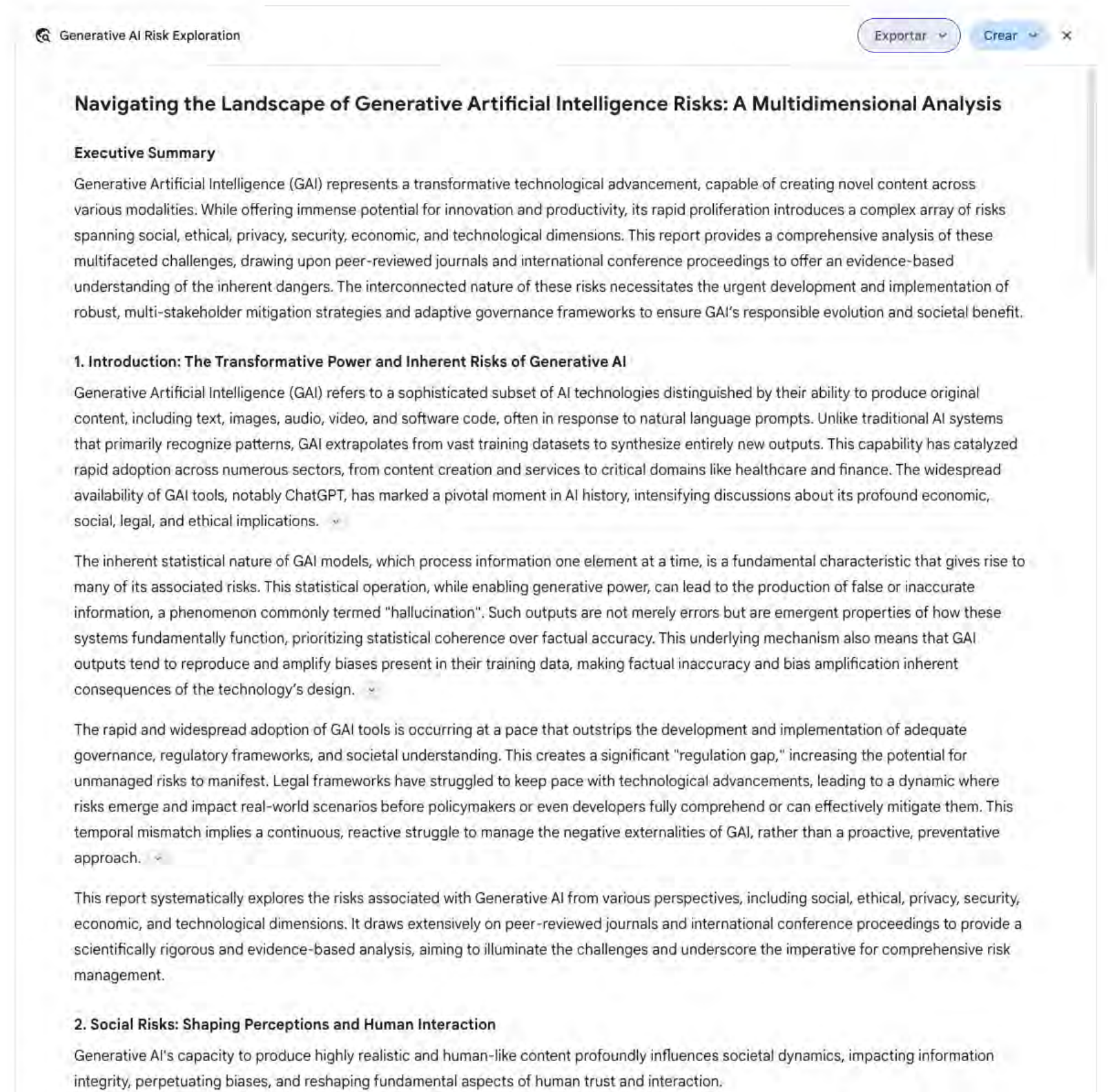


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Start research

I've completed your research. Feel free to ask me follow-up questions or request changes.

Generative AI Risk Exploration

30 May, 10:17

Generative AI Risk Exploration

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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

oecd.ai/en/genai/issues/ns...

Generative AI: Privacy & Intellectual Property - Research...

llbguides.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

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Start research

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Generative AI Risk Exploration

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Generative AI Risk Exploration

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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.

Fuentes usadas en el informe

ibm.com

AI Adoption Challenges | IBM

cte.alliant.edu

Concerns about Generative Artificial Intelligence | Alliant International University Center for Teaching Excellence

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oecd.org

AI principles - OECD

hyperproof.io

NIST AI Risk Management Framework: The Ultimate Guide - Hyperproof

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Limitations and risks - Generative Artificial Intelligence and ...

nist.gov

Artificial Intelligence Safety Institute Consortium (AISIC) | NIST

ai.google.dev

Responsible Generative AI Toolkit | Google AI for ... - Gemini API

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U.S. Artificial Intelligence Safety Institute | NIST

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Responsible Generative AI Framework (RGAF) Version 0.9 - Now ...

academic.oup.com

Generative propaganda: Evidence of AI's impact from a state-backed disinformation campaign | PNAS Nexus | Oxford Academic

tmb.apaopen.org

Humans and Generative AI - Volume 6, Issue 1 - Technology, Mind, and Behavior

researchgate.net

(PDF) ETHICAL IMPLICATIONS AND BIAS IN GENERATIVE AI - ResearchGate

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Explainable Generative AI (GenXAI): A Survey, Conceptualization, and Research Agenda

aaup.org

Paradoxes of Generative AI: Both Promise and Threat to Academic Freedom - AAUP

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Research Integrity and Human Agency in Research Intertwined with Generative AI

oracle.com

What Is Generative AI (GenAI)? How Does It Work? - Oracle

arxiv.org

Blessing or curse? A survey on the Impact of Generative AI on Fake News - arXiv

widener.libguides.com

What is Generative AI? - Artificial Intelligence (AI) & Information Literacy - Wolfram Subject Guides at Widener University

publicintegrity.org

What will generative AI mean for the racial wealth gap? - Center for Public Integrity

arxiv.org

GENERATIVE AI IMPACT ON LABOR MARKET: ANALYZING CHATGPT'S DEMAND IN JOB ADVERTISEMENTS - arXiv

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Artificial Intelligence Impact on Labor Markets - International Economic Development Council (IEDC)

ey.com

Navigate the economic risks and challenges of generative AI | EY - Global

hbs.edu

Displacement or Complementarity? The Labor Market Impact of Generative AI - Harvard Business School

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Fuentes consultadas, pero no usadas en el informe ^

 **partnershiponai.org** Partnership on AI Launches New Initiative to Guide Enterprise Organizations in Responsible AI Adoption

 **arxiv.org** On the Challenges and Opportunities in Generative AI - arXiv

aaai.org AAAI-25 New Faculty Highlights Program

 **pmc.ncbi.nlm.nih.gov** Explainable AI: A Review of Machine Learning Interpretability Methods - PMC

 **ox.ac.uk** Expert Comment: How is generative AI transforming the labour market? | University of Oxford

 **cybersecurity.umbc.edu** Talk: Unveiling Privacy Risks in AI: Data, Models, and Systems – Cybersecurity News

 **youtube.com** USENIX Security '24 - Prompt Stealing Attacks Against Text-to-Image Generation Models

 **youtube.com** How Different Groups Prioritize Ethical Values for Responsible AI – YouTube

 **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 photograph of a long, straight asphalt road stretching into the distance, flanked by water. The road has yellow dashed lines on either side. 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





References

History



- This material is based on editions of the following seminars

https://bit.ly/3db1Fj8 12,5	10.13140/RG.2.1.4131.4329	https://goo.gl/4rPiZn	10.5281/zenodo.1067680	10.5281/zenodo.1069690	10.5281/zenodo.399302	10.13140/RG.2.2.15223.42403
10.13140/RG.2.2.34015.87206	10.5281/zenodo.2586725	10.5281/zenodo.3692796	10.5281/zenodo.4700155	10.5281/zenodo.4716246	10.5281/zenodo.4732089	10.5281/zenodo.4745223
10.5281/zenodo.4777633	10.5281/zenodo.6320299	10.5281/zenodo.6384489	10.5281/zenodo.6522136	10.5281/zenodo.7144360	10.5281/zenodo.7185161	10.5281/zenodo.7381345
10.5281/zenodo.7725299	10.5281/zenodo.7831074	10.5281/zenodo.7830939	10.5281/zenodo.10801556	10.5281/zenodo.10972526	10.5281/zenodo.15023938	10.5281/zenodo.15552192
10.5281/zenodo.19050297	10.5281/zenodo.2047821					

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Francisco José García-Peñalvo

Grupo GRIAL

Dpto. Informática y Automática

Instituto Universitario de Ciencias de la Educación (<https://ror.org/00xnj6419>)

Universidad de Salamanca (<https://ror.org/02f40zc51>), Salamanca, España

fgarcia@usal.es

<https://orcid.org/0000-0001-9987-5584>

<http://grial.usal.es>

<https://twitter.com/frangp>

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