Chapter 3: Artificial Intelligence for Documentary Research

A range of AI tools proves highly beneficial in the execution of scholarly assignments. Certain tools offer support across every phase of the documentary research process.

3.1 Documentary Research: Key Stages

Documentary research constitutes an essential component in the majority of university-level coursework. Acquiring robust information literacy competencies facilitates smoother progression through one's academic curriculum and subsequent professional endeavors. Irrespective of the specific assignment, the documentary research process remains fundamentally consistent, comprising distinct stages, each subdivided into sub-stages.

Adherence to these stages not only conserves time by minimizing revisions and corrections but also elevates the scholarly quality of the output. The documentary research process presented here includes four main stages.

1. Prepare Your Research

Before diving into a search tool, complete some essential preparatory steps. These initial tasks are crucial—they help you work efficiently while saving valuable time!

Determine the Assignment Type and Create a Timeline(type de travail à réaliser et élaborez un échéancier)

Depending on the type of work required (report, essay, research paper, etc.) and the given deadline, assess how in-depth your documentary research needs to be and how much time you'll invest. This allows you to build a realistic timeline. This time management tool is indispensable: it lets you track progress and ensures you meet deadlines!

2. Conduct Your Research(realiser votre recherche)

Once you've established your concept plan, develop your search strategy. Tailor the search query to the tool you're using, as query languages can differ between platforms. Pay close attention to evaluating and managing sources—reference management software can save you significant time!

Many tools support zoned searches (e.g., your library catalog or specialized databases), allowing direct queries by:

- Title
- Author
- Subject(s)
- Document type(s)
- Date

Advanced search options enable similar refinements for more precise results.

- ✓ **Crafting Smart Search Queries(**Rédaction de requêtes intelligentes**)**

Now that you've defined your topic and developed your concept plan, you can build your search query. To do this, combine your keywords using linking operators, also known as "Boolean operators."

For greater efficiency and precision, use these search tips:

Search Tips

Tip	**When to Use**	**Example**
* (truncation)	To find all possible endings of a term	Nutri* Matches: *nutrition*, *nutritional*, *nutriment*, *nutriments*

Tip	When to Use	Example
" " (quotes)	To find a series of words in exact order	"pomme de terre" Matches these words together, exactly as written

What to Avoid

Avoid these elements in your search queries for better results:

- Filler words (e.g., *le, la, les, du, des, sur*)
- Terms describing relationships between ideas that don't capture the core topic (e.g., *effects, causes, consequences, advantages, disadvantages*)

Be careful! The choice and spelling of your words have a major impact on search results.

Adjusting Your Search

Remarks:

a. **Too Many Results – Narrow Your Search(trop de resultants)** You might get too many or irrelevant results. Adapt using these techniques:

- Add concepts linked by AND/ET operator *Example:* travail AND étudiant AND réussite
- Apply filters (publication years, document types, file types, etc.)
- Use quotes for exact multi-word phrases *Example:* "réseaux sociaux"
- Exclude terms with NOT/SAUF or minus sign (-)

b. Too Few Results – Broaden Your Search(peu de resultants)

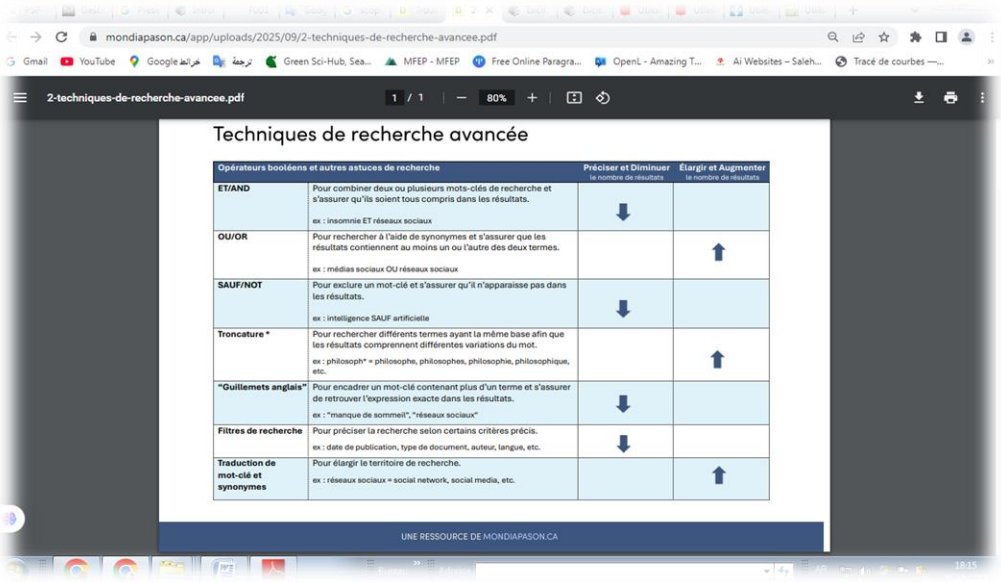
- Remove less essential concepts

- Try other sources or document types
- Use synonyms in parentheses with OR/OU
  Example: (travail OR emploi)
- Apply truncation (*) for word variations
  Example: philosoph* (covers *philosophie*, *philosophe(s)*, *philosopher*)

Irrelevant Results(resultants non pertinent)

- Switch sources or document types
- Try synonyms or new query combinations
- Revise your research question entirely

Consult the following document to learn tips on how to refine or broaden your search.



3- **Evaluate Your Sources**

To select only suitable documents from potentially numerous search results, verify if they meet your original needs. Relevance must always align with your initial documentary requirements—so take time to define them clearly and revisit them after searching.

4-Write Your Paper and Cite Sources

You've now reached the final research stage. Synthesize the information from your consulted sources, focusing carefully on presentation and citing them according to recognized standards.[1]

3.2 Research Tools Overview

1.Elicit

Elicit is an AI-powered research assistant that rapidly finds and analyzes scientific publications from Semantic Scholar's database. It uses semantic analysis to understand natural language questions, generating research reports, relevant paper lists, study quality assessments, and concise answers.

Key Features

- Semantic search without strict keywords
- Automated summaries, data extraction, and interactive analysis
- PDF uploads for custom papers
- Reference exports to Zotero/EndNote
- Search history and conversation with papers

Main Advantages

- Question-based literature discovery
- Evidence synthesis and filtering by journal quality
- Key insights extraction and workflow support

Best Uses

Literature reviews, concept mapping, rapid article ID, database complement[2]

2. Web of Science Research Assistant

The Web of Science Research Assistant is an artificial intelligence (AI)-based tool integrated into the Web of Science database. Accessible to the entire university

community, this assistant enables searches within the Web of Science Core Collection, which includes over 22,000 high-quality scientific journals.[3]

Features

The Web of Science Research Assistant allows you to launch a query from a research statement and provides a response supported by identified sources, including their references.
Additionally, the assistant offers a graphical representation of the main topics commonly associated with your research question and generates a list of leading researchers in the relevant field.[4]

What Are the Main Advantages of Web of Science Research Assistant?

- Search for reliable sources from a recognized scientific database
- Document searches using questions phrased in your own words and in multiple languages
- Generation of a summarized response to the research question based on semantic analysis of identified studies
- Exploration of similar themes through tool suggestions
- Ability to draw inspiration from the tool-generated search strategy for queries in other databases[5]

Where Do the Articles Listed by Web of Science Research Assistant Come From?

All results presented by the Research Assistant come from the Web of Science Core Collection, which aggregates articles from 22,000 high-quality scientific journals across more than 254 disciplines: natural and applied sciences, health sciences (the best-covered domains), social sciences, arts, and humanities.[6]

How Does Web of Science Research Assistant Determine Result Relevance?

The assistant determines result relevance by combining two approaches. First, it identifies articles with the highest semantic similarity to the question, then

supplements with keyword-based results. Next, the tool applies a proprietary ranking algorithm that reorganizes articles by similarity score to the query, ensuring the most relevant appear at the top.

3- Scopus AI

Lien video scopus

https://www.youtube.com/watch?v=eGhKpMvjXnQ

4-Scispace

SciSpace is an AI-powered academic platform designed to streamline literature reviews, research, and scientific writing, formerly known as Typeset.io. It provides a comprehensive workspace featuring a research assistant (Copilot) to analyze PDFs, a database of over 270 million papers, and tools for citation generation, paraphrasing, and AI detection.

Key Aspects of SciSpace:

- AI-Powered Research Assistant **(Copilot):** An interactive tool that explains complex scientific concepts, answers questions about papers, and summarizes text, including support for scanned PDFs via OCR.
- **Literature Review Tool:** Allows users to search for academic papers, extract key insights, and compare multiple sources in a structured, automated manner.
- **Academic Writing & Publishing:** Includes an AI writer, citation generator (supporting thousands of styles), and a plagiarism/AI detector, helping users format and edit manuscripts.
- **Repository Access:** Provides access to over 200 million+ meta-data entries and 50 million+ open-access full-text PDFs.
- **Target Users:** Designed for researchers, students, and academic professionals looking to save time on manual, repetitive tasks.

SciSpace functions as an "all-in-one" platform for the entire research lifecycle, from discovery and reading to writing and publishing.

Le lien

https://www.youtube.com/watch?v=7r3E-XSDay4

https://www.youtube.com/watch?v=rTucc0sMoeA

3.3 Writing Smart Queries

What is it?

A "smart query" is a well-formulated question for AI tools (like Perplexity or ChatGPT). Instead of random searching, the AI directly provides the best math documents.

Simple Steps

1. **Write your topic**: e.g., "differential equations."
2. **Add precise words**: "solved exercises" or "PDF course"
3. **Ask the AI**: "Find me 3 simple articles on differential equations for L1 math."

Before/After Example:

❌ "equations" → Too vague (1000 results).

✓ "AI find L1 math differential equations exercises PDF free" → 5 precise results.

Free Tools: Perplexity.ai, Google with AI, ChatGPT.

2. Automatic Article Summarization

How Does It Work?

The AI reads a 20-page article and gives you **1 simple paragraph** with:

- The problem studied
- The solution found
- Its relevance to your studies

Concrete Example (Math)

Original Article (too hard for L1): "Spectral theorem for operators."
AI Summary: "This article explains how square matrices have eigen values. Useful for diagonalization in L1 linear algebra. Method: characteristic polynomial."

Easy Tools

- Copy the PDF link → Paste into ChatGPT ("summarize this article simply").
- Semantic Scholar (TL;DR button = automatic summary).

Important Limit: The AI can make mistakes. **Always check** the article's introduction.

3. Checking AI Sources

Quick Checklist (5 questions)

Question	YES Answer = ✅	Example
Does the article really exist?	Search the title on Google Scholar	"Matrix eigenvalues L1"
Is it recent?	Less than 5 years	2023 > OK
Is it for your level?	No crazy formulas	No quantum physics
Serious author?	Known university	University of Biskra
Does AI give the exact link?	Click to check	DOI or direct PDF

AI DANGER: the "inventions"

AI can **invent** articles that don't exist (15% of the time).
Solution: Write the exact title on Google Scholar. No result = FAKE.

Exercises;

Exercise 1 : Transform these vague searches into smart AI queries for L1 Math.

a) Vague: "limits"
Smart query: ……

b) Vague: "matrices"
Smart query: …….

SOLUTIONS:
a) "Find 3 simple PDF exercises on limits for L1 math with solutions"
b) "L1 linear algebra matrices exercises solved PDF free download".