

Literature review with AI

MCB, 2026/2027

Responsible Use of AI for MSc Thesis Literature Reviews

- AI as a research assistant, not a research replacement
- Finding, understanding, and synthesizing scientific literature
- Working responsibly and transparently

Why This Matters

- Literature review is the foundation of a thesis
- AI tools are becoming standard research assistants
- Good use can save time
- Poor use can introduce bias, errors, and fabricated information

Key message: Your thesis is assessed on your scientific judgement, not on the quality of the AI output.

What AI Can and Cannot Do

AI can help

- Generate keywords
- Refine research questions
- Summarize papers
- Compare concepts
- Identify knowledge gaps

AI cannot reliably

- Find all relevant literature
- Judge study quality automatically
- Replace reading papers
- Guarantee factual accuracy
- Cite sources it has not accessed

Responsible Use Principles

- Verify all claims against original sources
- Never cite AI as a scientific source
- Read papers before citing them
- Disclose AI use when required
- Maintain academic integrity

Rule: No paper should appear in your thesis unless you have personally reviewed it.

PART I:

DEFINING THE RESEARCH QUESTION

Starting from the Research Question

Example topic:

How do agrivoltaic systems affect biodiversity in Mediterranean ecosystems?

Break down into:

- Population/System
- Intervention
- Outcome
- Context

Result:

- Agrivoltaics
- Biodiversity
- Mediterranean region
- Ecosystem services

Using AI to Refine Research Questions

Prompt example:

Act as an environmental research advisor. Suggest five research questions investigating biodiversity impacts of agrivoltaic systems.

AI can help generate:

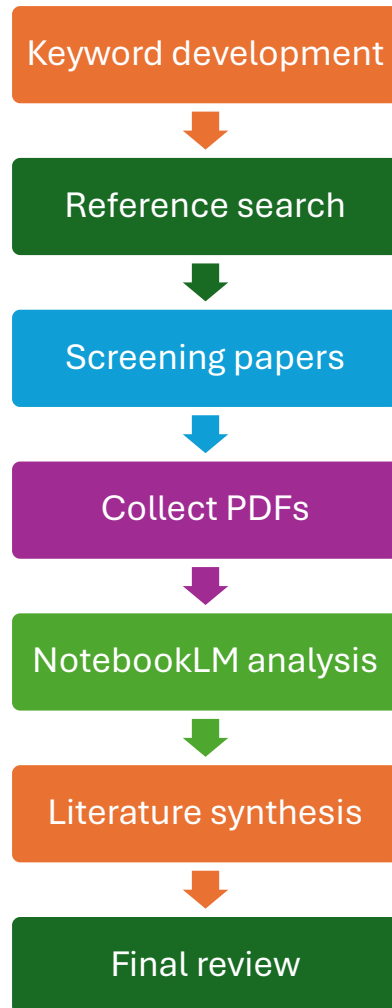
- Alternative formulations
- Scope refinement
- Variables
- Hypotheses

Students evaluate and select the final question.

PART II:

FINDING THE LITERATURE

Literature Review Workflow



Building Search Terms

Example:

Biodiversity impacts of agrivoltaics

Search term:

(agrivoltaic OR agrovoltaic) AND
biodiversity

AI can suggest keywords, but
students must validate them.

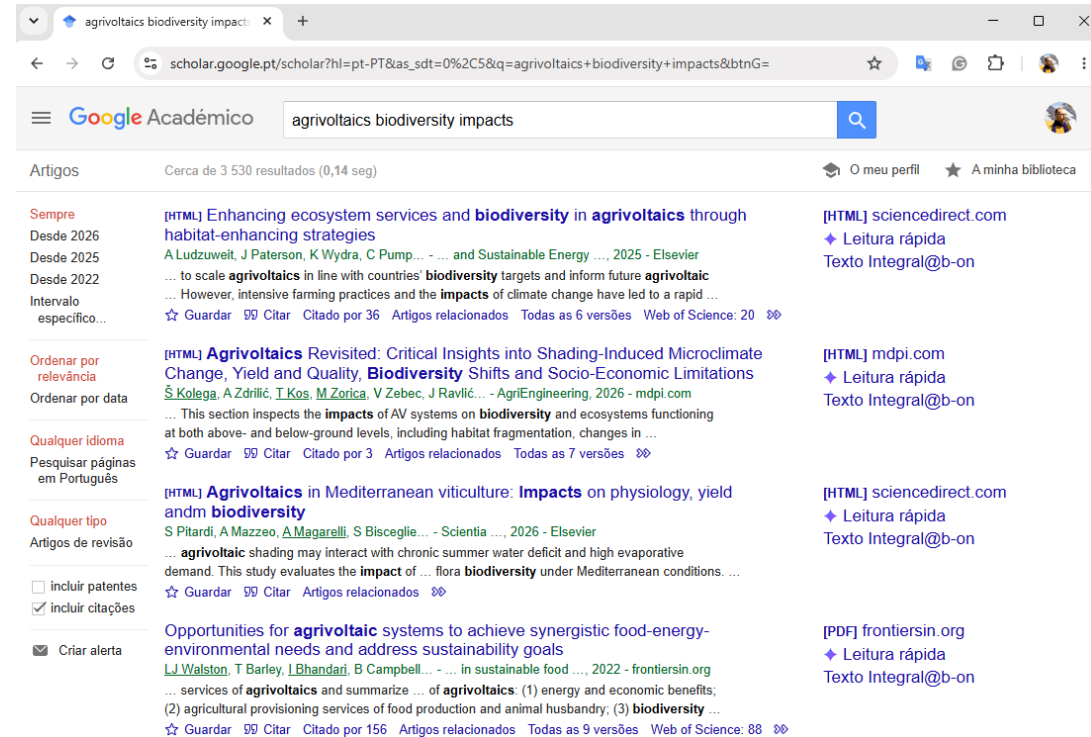
Keywords:

- agrivoltaic
- agrovoltaic
- solar agriculture
- biodiversity
- pollinators
- ecosystem services
- Mediterranean

Searching Google Scholar

Google Scholar finds:

- journal articles
- conference papers
- reports
- theses



Searching Google Scholar

Basic search: `agrivoltaic biodiversity`

Exact phrase: `"agrivoltaic systems" biodiversity`

Alternative terms: `(agrivoltaic OR agrovoltaic) pollinators`

Combine concepts: `agrivoltaic AND ecosystem services`

Exclude terms: `agrivoltaic biodiversity -economics`

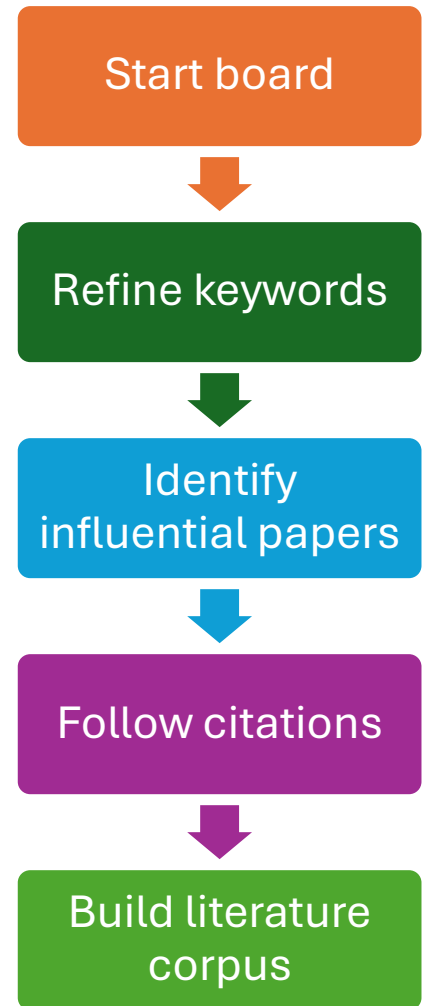
Author search: `author:"Barron-Gafford" agrivoltaic`

Title search: `intitle:agrivoltaic biodiversity`

Find review papers: `agrivoltaic biodiversity review`

Recent studies: use the Since 2023 filter

Citation chasing use Cited by and Related articles



Searching Scopus

Why Scopus?

- High-quality indexed journals
- Citation analysis
- Subject filtering
- Export citations

Refine by:

- publication year
- document type
- subject area

The screenshot shows the Scopus search interface. The search query is 'agrivoltaic AND biodiversity'. The results are displayed in a table with columns: Document title, Authors, Source, Year, and Citations. There are 33 documents found. The first three results are shown below.

	Document title	Authors	Source	Year	Citations
1	A multi-criteria GIS-AHP framework for optimizing agrivoltaic energy production and land use efficiency in semi-arid regions	Manimuthu S., Partheeban P., Vijayakumar G., Hemamalini R.R., Bisane M.G.	Renewable Energy, 273, 126085	2026	0
2	Agrivoltaics in Mediterranean viticulture: Impacts on physiology, yield and biodiversity	Pitardi S., Mazzeo A., Magarelli A., Debiase G., Ferrara G.	Scientia Horticulturae, 366, 115039	2026	0
3	Linking Soil Threats and Mitigating Management Practices Across Climate Zones From a Global Soil Ecosystem	Esparza-Robles U.R., Munoz P.	European Journal of Soil Science	2026	0

Screening and Selecting Papers

Questions to ask:

- Is it relevant?
- Is it peer-reviewed?
- What methodology is used?
- Is the sample size adequate?
- Are conclusions supported by data?

AI can assist with screening summaries, but final decisions remain yours.

PART III:

USING NOTEBOOKLM

Why NotebookLM?

NotebookLM works with:

- PDFs
- Reports
- Notes
- Uploaded references

Advantages:

- Only uses uploaded documents
- Provides source references
- Reduces hallucinations

Building a Literature Review Corpus

Example collection:

- 20-30 major papers on agrivoltaics
- Review papers
- Recent biodiversity studies
- Relevant policy reports

Upload all documents before asking questions.

Testing Your Research Questions

Upload the papers.

Ask:

Based on these sources, what evidence exists regarding biodiversity impacts of agrivoltaics?

Then:

What are the main disagreements among authors?

Then:

Which questions remain unanswered?

Identifying Knowledge Gaps

Example outputs:

Current evidence:

- positive effects on pollinators
- improved habitat heterogeneity

Still unclear:

- long-term ecosystem impacts
- Mediterranean climate effects
- effects on endemic species

These become possible thesis contributions. 😊

Example Prompt for Critical Analysis

Prompt:

Compare the methodologies used in the uploaded papers.
Identify strengths, weaknesses, assumptions and major limitations.

Expected outcome:

- comparative table
- methodological critique
- research gaps

Students should verify all conclusions against the original papers.

PART IV: RISKS AND LIMITATIONS

Common Mistakes When Using AI

- ✗ Asking ChatGPT for references
- ✗ Citing papers not read
- ✗ Using AI-generated text directly
- ✗ Accepting summaries uncritically
- ✗ Treating AI outputs as evidence

Instead:

- ✓ Verify
- ✓ Read
- ✓ Critically evaluate
- ✓ Cross-check sources

The Modern Literature Review Ecosystem

This was just an example of an AI-powered workflow.

Different AI tools support different tasks

Stage	Examples of Tools
Research question development	ChatGPT, Copilot, Gemini, Claude
Literature discovery	Google Scholar, Scopus, Consensus
Citation mapping	Connected Papers, Research Rabbit
Paper reading	NotebookLM, SciSpace
Evidence synthesis	NotebookLM, Elicit
Writing support	Copilot, ChatGPT, Claude
Reference management	Zotero, Mendeley

Consensus for Evidence-Based Searching

Consensus is an AI search engine focused on scientific literature.

It can:

- Search papers
- Provide evidence summaries
- Highlight scientific consensus
- Link to original studies

Research Rabbit for Literature Discovery

Research Rabbit helps you discover papers beyond keyword searches.

Features:

- Citation networks
- Author networks
- Related publications
- Identification of influential researchers

Example:

Starting from a landmark agrivoltaics paper, Research Rabbit can reveal:

- *Earlier foundational studies*
- *Related biodiversity research*
- *Frequently collaborating research groups*

It is especially useful when entering a new research field.

Connected Papers for Visual Exploration of the Literature

Starting with one paper, Connected Papers identifies:

- Previous work
- Related work
- Influential papers
- Research clusters

SciSpace for Reading Papers

AI-Assisted Understanding

Useful functions:

- Explain technical passages
- Explain equations
- Define unfamiliar concepts
- Summarize sections

AI explanations are interpretations, not authoritative definitions.

Elicit for Evidence Synthesis

Organising Scientific Evidence

Elicit helps:

- Extract key information
- Compare studies
- Build evidence tables
- Identify trends

Students still need to verify extracted information.

AI Beyond the Literature Review

AI can support:

Before research

- Topic exploration
- Research questions
- Search terms

Writing

- Structure
- Editing
- Visualisation

During research

- Literature review
- Coding assistance
- Data analysis

Defence preparation

- Mock questions
- Presentation refinement

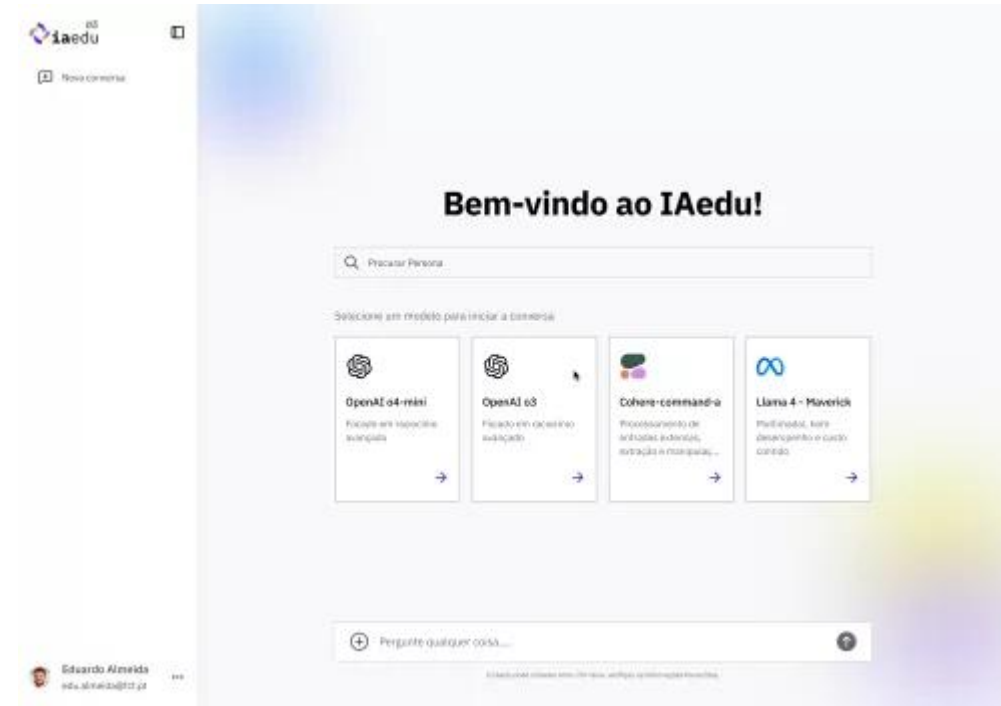
AI should support,
not replace,
scientific reasoning.

IAEdu.pt

Responsible AI for Higher Education

IAEdu provides resources for:

- Generative AI literacy
- Responsible AI use
- Academic integrity
- Teaching and learning support
- Guidelines for students and teachers



Education

Google Workspace Education Plus



O Google Workspace Education Plus é a tua central de comunicação, colaboração e estudo na Universidade de Lisboa!

Através do teu e-mail institucional, tens acesso direto a todas as apps do universo Google para criares trabalhos em grupo, assistires a aulas online, organizares a tua agenda e guardares os teus ficheiros na nuvem com total segurança.

Principais Funcionalidades

- **Comunicação e Correio Eletrónico:** Gmail (caixa de correio institucional sob o domínio @edu.ulisboa.pt), Google Chat (mensagens diretas e espaços de equipa) e Google Meet (videochamadas, reuniões virtuais e transmissão de aulas).
- **Produtividade e Colaboração:** Google Docs (processador de texto), Google Sheets (folhas de cálculo), Google Slides (apresentações), Google Forms (inquéritos e testes), Google Keep (notas e listas) e Google Sites (criação de páginas web de projetos/cadeiras).
- **Armazenamento e Organização:** Google Drive (armazenamento individual e Drives Partilhadas para equipas/unidades) e Google Calendar / Agenda (gestão de horários, reuniões e eventos).
- **Inteligência Artificial:** Integração da Inteligência Artificial no próprio ambiente de trabalho. Para além do acesso ao Gemini como assistente autónomo, a nova versão disponibiliza funcionalidades de IA diretamente no Docs, Slides, Forms, Vids, entre outros.
- **Ensino e Aprendizagem:** Google Classroom (plataforma de gestão de turmas, partilha de materiais de aula e entrega de trabalhos).
- **Segurança e Identidade:** Tudo isto ligado à tua **Conta ULisboa**, garantindo que as tuas informações e trabalhos estão protegidos pelas políticas de privacidade da universidade.

MENU

- ▶ Serviços
- ▶ Apoio e Helpdesk

LIGAÇÕES ÚTEIS

- ▶ Google Workspace Education Plus
- ▶ Email Google
- ▶ Armazenamento Google

OTHERS ULisboa strengthens its artificial intelligence, productivity, and collaboration ecosystem for the entire academic community

By the end of October 2026, students, faculty, researchers, and technical and administrative staff at the University of Lisbon will have access to the Education Plus edition of Google Workspace, which includes new features for artificial intelligence, productivity, collaboration, teaching, and security. This update is part of the suite of digital services provided by ULisboa and allows users to apply these tools in various contexts related to teaching, learning, research and innovation.

AI, Transparency and the Thesis Defence

Use AI for

- brainstorming
- search strategy development
- paper comparison
- gap identification
- question refinement

Do not use AI for

- generating references
- replacing reading
- replacing critical thinking
- writing factual claims without verification

AI, Transparency and the Thesis Defence

Transparency is essential

Your thesis should include a:

"Declaration on the Use of Artificial Intelligence Tools"

Examples of uses that should be declared:

- Language revision
- Text structuring/editing
- Exploratory information searches
- Coding assistance
- Data analysis support
- Figure generation

AI, Transparency and the Thesis Defence

During the defence, you **will** be asked to:

- Explain methodological choices
- Justify assumptions
- Discuss limitations
- Reproduce analyses
- Defend conclusions

The defence validates authorship and understanding, not whether AI was used.

AI is a tool, not an author.

Use AI to find, organize and question knowledge.

Use your own expertise to evaluate, interpret and create knowledge.