

Guidelines for Master Theses: Learning Analytics & Educational Technology

Research Professorship Learning Analytics, CATALPA, FernUniversität in Hagen

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This document answers frequently asked questions about the process of writing a master thesis at the Learning Analytics research professorship.

Getting in touch: If you are interested in writing your master thesis with us, read this document and then send a short email to ioana.jivet@fernuni-hagen.de introducing yourself, your area of interest and a potential topic. We will arrange a brief meeting to discuss possible topics and directions.

Finding a Topic

Theses are conducted within the research area of Learning Analytics and Educational Technology. This includes, but is not limited to, learning analytics applications and dashboards, feedback and reflection tools, learning design, educational data mining, self-regulated learning support, AI in education, and the ethical and methodological dimensions of LA research.

To get a sense of the scope and to identify possible directions:

- Browse our [publications list](#). We expect you to have done this before reaching out.
- Review previously completed theses (list coming soon).

What makes a good research question?

Good research questions are difficult to define — we will support you in the process. We do expect you to have read into the area first. A strong research question is:

- *Formulated as an open question* — not just a topic area ("learning dashboards") and not a yes/no question ("Can a dashboard improve motivation?")
- *Appropriately scoped* — not too broad ("How can AI support learning?"), not too narrow ("Optimal hyperparameter configuration of model X on dataset Y")
- *Genuinely interesting to you* — you will spend months on it; the answer should not already be known or trivially derivable

Types of theses:

- **[RES] Research projects** — investigation and exploration of specific questions; application of research methodologies to gather and/or analyze data.

- **[DEV] Development projects** — solving a problem through design, implementation (code), and evaluation.

Many strong theses combine both: a developed artefact evaluated through an empirical study.

Exposé

Before formally registering the thesis with the Prüfungsamt, we require you to write an **exposé** (max. 4 pages), which you submit and discuss with us. The exposé should briefly cover:

1. Problem description — what is the problem and why does it matter?
2. State of the art — what research has already been done in this area?
3. Research question(s)
4. Theoretical framework — which theories or models does your work build on?
5. Methods — how will you answer the research question?
6. References

The exposé is not graded. It ensures we are aligned on scope and feasibility before the clock starts. Please note that in order to write a strong exposé, you will need to have read into the area first.

Registration with the Prüfungsamt

To register the thesis with the Prüfungsamt, fill out the [registration form](#) and send it to ioana.jivet@fernuni-hagen.de.

We will arrange a second supervisor unless you have a specific preference.

The thesis period begins on the day of registration. Master theses have a standard submission deadline of 6 months; bachelor theses 3 months — check your Prüfungsordnung for the exact duration.

Writing the Thesis

Language

Theses can be written in English or German. We strongly recommend **English**: virtually all relevant literature is in English, and translating technical vocabulary is error-prone. However, you will not receive a lower grade if you choose German.

Length

There are no minimum page requirements. Length should be determined entirely by what the topic requires. Shorter and focused is better than a thesis with filler text. As a rough orientation: master theses are typically 50–70 pages.

Template

We recommend using LaTeX. An [Overleaf template](#) is available. You are free to use any software, but the final document should match the template in the essentials (citation style, font size, layout).

Structure

The template structure is a starting point, not set in stone. Think carefully about what your specific thesis needs to contain. Agree on an outline (section headings + brief notes on content) with us before you commit to it.

Writing process

Start writing early. Do not wait until the final weeks to start writing — document decisions as you make them (e.g. write up methods choices in the methods section while you are making them), and write in parallel with implementation.

Literature

Finding relevant literature is part of your independent scientific contribution. Use:

- [Google Scholar](#)
- [Semantic Scholar](#)
- [ACM Digital Library](#)
- Proceedings of conferences in the field: LAK, AIED, EDM, UMAP, CHI, ECTEL, etc.

Invest time in forming good search queries: identify the key concepts in your research question and express each with multiple synonyms (e.g. "learning dashboard" OR "student-facing analytics" OR "awareness tool"). Combine concepts with AND to narrow results (e.g. "learning analytics" AND "self-regulated learning"). Use quotation marks for concepts with more than one word. Iterating on your keyword combinations is part of the process — a first search is rarely the best one.

Once you have identified key references, apply both **forward search** (newer papers that cite your core papers) and **backward search** (important papers cited by your core papers). Use Google Scholar's "Cited by" feature for forward search and the references section of papers for backward search.

The screenshot shows a Google Scholar search results page for the query "learning analytics". The search bar at the top contains the text "learning analytics" and a magnifying glass icon. Below the search bar, it indicates "Articles" and "About 319,000 results (0,65 sec)". On the left side, there are filters for "Any time" (with sub-options: Since 2026, Since 2025, Since 2022, Custom range...), "Sort by relevance" (with sub-option: Sort by date), and "Any type" (with sub-option: Review articles). The main results area displays two articles. The first article is titled "Learning analytics: The emergence of a discipline" by G. Siemens, published in 2013 on journals.sagepub.com. It has 2696 citations, and a red arrow points to the "Cited by 2696" link. The second article is titled "A reference model for learning analytics" by MA Chatti and AL Dyckhoff, published in 2012 on inderscienceonline.com. It has 1314 citations. Both articles have links for "Save", "Cite", "Related articles", "All versions", and "Import into BibTeX". On the right side, there are links to "[PDF] sagepub.com" and "[PDF] archive.org", each with a "Sign in" button.

Code

All code must be runnable and documented. Someone without prior knowledge of your specific topic should be able to reproduce the core results from your thesis.

Use of AI tools

Follow the [FernUniversität guidelines on AI use in theses](#). These specify where AI tools may be used and how use must be reported.

Plagiarism

Any content taken from other publications, websites, or sources must be cited with an appropriate reference.

Get help

The [Schreibzentrum of the FernUniversität Hagen](#) offers workshops and support for academic writing, including proper citation practices.

Supervision

Principle: this is your work; we advise. Work as independently as possible, but do not hesitate to ask questions.

The quality of supervision depends on the quality of your preparation. Come to meetings with specific questions and concrete material. The key is to ask well-formed questions.

- **Weak question:** "What should I do next?"
- **Strong question:** "I have looked at approaches X and Y. I think X is more appropriate because of [reason], but I am unsure whether it fits within the scope we agreed on. My plan is [concrete plan] — does this make sense?"

What we offer:

- Regular meetings (every two weeks) to discuss progress and questions — prepare an agenda and a list of open questions for each meeting
- Early consultation to assess scope and feasibility of the research plan
- Feedback on the initial thesis outline
- Feedback on one draft chapter or section of your choice
- Feedback on the first draft of your defence slides

Defence (Kolloquium)

Timing: The defence takes place within 6 weeks after thesis submission. An earlier date can be arranged on request.

Format:

- 15-minute presentation + 15-minute discussion
- The time is deliberately short. Select your core results carefully — do not try to present everything. General rule of thumb to measure how long a presentation takes is 1min/slide.
- No requirements on slide design. In general: as little text as possible; prefer diagrams, figures, and tables.

Presentation:

- Speak freely. Reading from slides exhausts the audience. They can read themselves.
- Be prepared to discuss limitations and alternative interpretations in the Q&A.

We will provide feedback on a first draft of your slides before the defence if you wish.

Grading Criteria

Grading follows a structured rubric. The weighting of criteria depends on the type and difficulty of the thesis.

Criterion	Description (5/5)	Points
General aspects		
Project management	Student took the lead independently, delivered everything on time, proactively identified action points, requested feedback asynchronously, organized meetings with supervisors, and came prepared.	/5
Difficulty of the problem	The problem was genuinely challenging; the student had to think creatively and independently research solutions beyond standard approaches	/5
Originality	Student makes a clear and identifiable original contribution; the work advances beyond existing solutions or knowledge	/5
Applicability	Results have practical relevance; the work addresses real problems; potential for use in practice is convincingly discussed.	/5
Research foundations		
Research question(s)	RQs are clearly formulated as open questions, well-motivated in the introduction, and grounded in the analysis of current literature.	/5
Scientific grounding	Literature review is comprehensive, systematic, and fully documented; covers relevant and current work; theoretical foundations are well-developed and carry through to later sections.	/5
Technical / Methodological approach		
System design and implementation	Technical approach is systematic and critical; the developed solution includes state-of-the-art components; requirements, design, architecture, and implementation are clearly and completely described.	/5
Study design and methods	Methodological choices are well-justified with discussion of alternatives; research design is appropriate for the RQs; sufficient detail provided for reproducibility. Data and instruments are appropriate for the RQs; data collection process is documented; validated instruments are used where applicable.	/5
Results and discussion		
Analysis of results	Results are summarized and clearly presented using appropriate figures, tables, and accompanying text; analyses are correctly applied and interpreted.	/5
Discussion and conclusion	Results are discussed in direct relation to the RQs and existing literature; limitations are clearly identified; implications for practice and directions for future research are addressed.	/5

Writing quality		
Readability and structure	Structure is clear, purposeful, and consistent; argumentation is coherent; technical terms used precisely and in relation to scientific discourse; the text is free of errors.	/5
Formal quality	Correct spelling and grammar; appropriate academic style; consistent citation format; complete reference list; no plagiarism indicators; effective use of figures, tables.	/5
Kolloquium		
Selected content and slides	Core findings are well-selected for presentation; slides are clear with appropriate information density, minimal text, and effective visuals	/5
Time management	Presentation fits within the allotted time; pacing allows adequate coverage of all key content without rushing	/5
Discussion	Questions answered with clarity, confidence, and strong command of the thesis content	/5