Individual Learning Projects: A How-To Guide

Executive Summary

This guide presents a practical approach to making individual learning projects, focusing on self-directed planning, execution, and reflection. It highlights the value of transparent processes and varied learning activities (including, but not limited to, ones using GenAI) to deepen understanding. Designed to build flexibility, creativity, and research skills, it encourages you to take ownership of your learning journey. The document outlines the context and step-by-step process of such projects. It also has a catalogue of example learning activities and a sample project deliverable.

Context

In our research methodology course (MIN), one of the key processes for learning about the course's concepts is through **"individual learning projects"**, in which you are asked to produce some outcome (e.g., a diagram, document, etc.) showcasing your skills and what you know about certain concepts. In these projects **we will not prescribe *how*** you need to study or learn in order to achieve that outcome, or whether you want to use GenAI tools to do so. Rather, we will ask you to **create your own "learning plan"**: a path with several steps (individual learning activities) which will lead you to be able to achieve the outcome in the allotted time. And then, of course, to **execute** that plan (and tell us about what you did, very concretely). This last point about telling/showing us your process is very important, as such **transparent, reproducible reporting** of what you did and what the outcomes were, is one of the central tenets of research and innovation (the topic of the course).

We have chosen this way of learning (vs. telling you explicitly to read this and that paper, and answer some questionnaires) because we think it is both more fun, creative, and effective (i.e., it will lead to you understanding and being able to apply them better elsewhere). Also, we expect this project-based, self-regulated way of learning will make you **more flexible, resourceful, and future-proof ICT professionals and researchers**. However, the "old way" of learning is still available, and every project assignment will have a "basic plan" which you can choose to do if you find it more suitable or you do not want to make your own learning plan. However, even if you choose this basic plan, we still expect you to **submit your assignments** in the same format, which documents not only what you created as the **outcome** for the assignment, but also the **process** that you followed (see Appendix B for a complete example).

This brief guide will walk you step-by-step through the process of doing one such "individual learning project" assignment. Albeit this is based on our knowledge of pedagogy and the learning sciences, this is meant as a practical guide, not a deep theoretical treatise on pedagogy or cognition.

How to create your own learning project and execute it

This is the process for how to do these assignments, step-by-step:

0. Make sure you have read some **basics about how to learn** (including how to learn with GenAI tools), by reading this blog post.
1. **Read carefully the assignment** and note a) what *outcome/artifact* is asked for; b) what *concepts or skills* should the outcome showcase (i.e., the learning goals); and c) the *time* allotted for the assignment. Oftentimes, these assignments (or a separate Moodle page) also have d) *links* to recommended resources (e.g., papers to read, videos to watch...) to use as a starting point.
2. **Create a learning plan** (i.e., a sequence of learning activities) to learn about the assignment's concepts/skills (see b. above) and produce a good deliverable artifact for the assignment (see a. above). Allocate reasonable times for each activity, so that the total aligns with the time allotted for the project (see c. above). An example of such a plan is available in Appendix B, and you can find a (non-exhaustive!) catalogue of learning activity ideas (i.e., building blocks for the plan) to get you started in Appendix A. Aside from following the principles laid out in the aforementioned blog post, other heuristics and rules of thumb you can use to make this plan:
    a. Make the plan have activities that are **varied** in your level of **activity/passivity** (don't make all activities be to just read documents or watch videos)
    b. Make all (or most) activities have a **concrete, observable outcome** (e.g., a document, a diagram, a list of ideas, etc.). If the result of an activity is "just in your head" (e.g., now I know about the types of X), then it is hard to know if you actually learned something or improved your skills (and it is hard to reproduce/trace it, see step 3 below).
    c. Make the plan be **varied in terms of the cognitive processes** required (Bloom's taxonomy of activities, mentioned in the linked blog post). Typically, you want to go from lower-level activities to higher-level ones (which are typically more difficult and complex), but you don't need to hit all the levels or follow the progression monotonically. For instance, sometimes having an "initial creation" activity to test your existing knowledge, before doing more reading on a topic, to later do a "final creation" activity, is both an engaging sequence and useful to know if you have progressed.
    d. If possible, you can combine **solitary** activities (read, watch, write... alone) with **social** ones (e.g., explain some concept to a colleague or friend, have the other ask you questions about the topic), be it with a human or with an AI chatbot.
    e. Most people tend to underestimate the time things take, so you can make a **plan for less time** than is allotted. Also, emergent learning activities can occur to you on-the-fly, hence it is nice to have some space for those as well.
3. Execute the learning plan! While you do so, make sure you write down the (approximate) **time each step/activity takes**, and make sure to **store the tangible outputs of each activity** (e.g., photos of hand-drawn artifacts, copies of partial

versions of artifacts, links to chatbot conversations accessible to others, etc.). These notes and links will make the bulk of a key part of this assignment deliverable, the **"methodological notes"** (see Appendix B for an example).

4. Make sure to **produce a final output** as specified in the assignment's problem statement. Double-check that you fulfill what is asked for, including aspects like the use of specific templates, length restrictions, concepts covered, etc. As noted above, the deliverable will typically have **three parts** (you can include them all in the same document): your original learning **plan** and expected timing, the final **output**, and the **methodological notes** with what you *actually* did step-by-step, how much time it *actually* took, and links to partial outcomes of each step. This should look similar to what you have in Appendix B.

That's it! We hope you enjoy learning about the (sometimes difficult) concepts of the course using this simple methodology 😊.

Appendix A: Example learning activities (with/without AI)

... for different levels of Bloom's taxonomy.

Remember

- Read an article, and try to recall from memory the key concepts or taxonomies in it
- Watch a video about Gartner's hype cycle, and write down the names of its phases
- Ask an AI chatbot to provide a summary of Kuhn's theory of scientific revolutions, and a label-less diagram of its process, and put the phase names in the diagram, correctly ordered
- Same as any of the above, but delaying the recall (e.g., try to write it the next day)
- From memory, sketch a one-page taxonomy of criteria for rigor in (qualitative and quantitative) research
- Have an AI jumble the steps of the PRISMA literature review process. Reorder them and justify the usefulness of each step in one sentence
- Have an AI generate spaced-repetition flashcards for key terms in the course; review them to >90% recall.

Understand

- Watch a video about qualitative and quantitative research, and summarize in your own words the main concepts in it
- Provide ten examples of research methods, five for data collection and five for data analysis
- Explain to a colleague what the role of the scientific community in the R&D system of a knowledge society is. Record the audio of your explanation and check they understood.
- Explain to an AI chatbot (acting as an expert researcher and philosopher of science) what is the difference between research and development or innovation. Have them give you feedback about your explanation.
- Have an AI tutor explain to you what is the knowledge society and the role of the scientific community in it, asking it questions about the parts you don't understand (use, e.g., the "Updated Tutoring Prompt" here)
- Teach-back: in 3 minutes, explain the main kinds of methods in ICT research to a peer, adding an example (not in the materials) of each; answer their 3 questions.
- Jigsaw the PRISMA: Home groups master one piece (PRISMA stage); then form mixed groups to teach each other and assemble an annotated end-to-end diagram explaining the why of each step.

Apply

- Create an AI roleplay simulator to practice and understand about formulating a research problem statement, as per Ellis's article on the topic (for an example, apply the "Simulation Creator" prompt here)
- Roleplay how you would explain to an AI student about different methodologies in your particular area of research interest, linking them with the concepts found in Dodig's article (use, e.g., the "Updated teach the AI as student" prompt here).
- Create a fictional but realistic case about the trajectory of a researcher, including details about your specific area of research interest, and things you would like your own trajectory to have in the future (use, e.g., the "Co-create a case" prompt here)
- Prompt AI to synthesize a small, realistic dataset (N≈60) for a qualitative (open responses) ICT-related questionnaire; give two examples of concepts you could label/code the dataset about.
- Build and execute a literature search (databases, keywords, Boolean strings); record hits and reasons for exclusion.

Analyze

- Use inferential statistics to analyze the results of an experimental study with respect to the research questions posed in your project
- Have an AI create a story about a particular ethical principle or dilemma. Then, critique the story, e.g., how it fails to consider nuances or the whole point of the principle (use, e.g., the "Critique the AI through story" prompt here)
- Feed AI three methods sections from real papers in your area of interest; it lists potential validity threats; you verify/refute each with paper evidence.
- Reverse-engineer one paper: extract RQs, hypotheses, variables, measures, analyses; draw their dependency diagram.

Evaluate

- Assess whether a qualitative approach contributes to generalizability or transferability of the study findings
- Write a peer review report on the paper-project submitted for publication or approval
- Draw connections between the theory of Kuhn and Gartner's cycle (by yourself). Then, have an AI help you connect the concepts of Kuhn and Gartner (use, e.g., the "Integration agent" prompt here). Compare your ideas with the AI's and update only with the ideas that seem semantically correct
- Ask AI for three operationalizations of a variable of interest in your field (e.g., "user engagement"); judge each operationalization for validity/reliability and defend your choice.
- Audit three papers using your open-science checklist (data/code availability, preregistration); recommend concrete fixes.
- Mock Grant Panel: Once you have an outline for your grant proposal, gather in a group and take roles (specialist in rigor/feasibility/ethics) with a rubric and deliver an individual justified score and overall reasoned fund/decline decision.

Create

- Create a concept map that provides an overview of the main actors, concepts and relations among them with respect to research and the scientific method
- Write a draft R&D&I proposal to be approved by a funding organism
- Have an AI tutor explain to you what is the knowledge society and the role of the scientific community in it, asking it questions about the parts you don't understand (use, e.g., the "Updated Tutoring Prompt" here)
- Create the outline for a scientific communication and have an AI mentor give you feedback about your initial ideas (use, e.g., the "AI mentor gives feedback" prompt here). Then, update the outline with the ideas that came to mind in this conversation.
- Design a "rigor playbook" poster listing common validity threats with matching mitigation tactics; present for peer critique.
- Create rubricts for the "mock grant panel" activity above.
- *(All the individual learning projects in the course basically end with a Create activity* ☺*)*

Meta (when doing the learning plan)

- Brainstorm 3 active learning activities about the topic of the assignment and then have an AI chatbot help you generate some more ideas (you can use the Active learning co-creator prompt). Judge (by yourself, not by the chatbot) both your and the chatbot's ideas in terms of which activity will make your mind work harder at the topic, and choose two activities to include in your learning plan

Appendix B: Example Project Deliverable

Problem statement (and allotted time)

"Create a *how-to guide* for master students to plan and execute individual learning projects for the MIN course. The project should showcase that you *understand* basic pedagogical principles (e.g., Bloom's taxonomy), and should include a *concrete example* of one project. You can use this blog post as a *supporting resource*, for yourself and for the students.

You have about *4 hours* to do this guide."

Learning plan

NB: Include estimated times for each step.

NB2: Note the activities below sum up to less than 4 hours. I know I'm notoriously bad at estimating how much time tasks will take me. YMMV.

NB3: Note how the activities below require different levels/processes in Bloom's taxonomy, from getting facts to creating an original artifact (although not necessarily all levels are addressed, and not in increasing order).

1. Create document with sections outline (15 min)
2. Create example learning plan (my plan for doing this guide) (15 min)
3. Read/revise about Bloom's taxonomy (10 min)
4. Write down introduction/context of the guide (and save partial version for methodological notes) (10 min)
5. Write down step-by-step process for doing a learning project (and save... etc. for steps below) (20 min)
6. Brainstorm learning activity ideas for learning activities at different levels of Bloom (25 min)
7. Search for (and add) further ideas/resources on how to use GenAI for learning (Mollick's post as starting point) (30 min)
8. Ask ChatGPT to critique my activity ideas, and add 3 more for each Bloom category (5 min)
9. Read critically and select the 1-2 best ideas for each Bloom category to complete the learning activity catalogue (15 min)
10. Ask a colleague for feedback on the current draft (as comments), and process his feedback (assess critically and make changes where relevant) (30 min)
11. Add executive summary (15 min)
12. Do methodological notes, add links to the partial versions (10 min)

Outcome

You guessed it. This very document is the outcome😊

Methodological notes

1. Create document with sections outline (link to partial doc) (15 min)
2. Create example learning plan (my plan for doing this guide) (link to partial doc) (15 min)
3. Read/revise about Bloom's taxonomy in Wikipedia (10 min)
4. Wikipedia was insufficient, so searched for "revised Bloom's taxonomy", read the AI summary and some of the linked resources (this and this) (20 min)
5. Write down introduction/context of the guide (and save partial version for methodological notes) (link to partial doc) (20 min)
6. Write down initial process for doing a learning project (link to partial doc) (30 min)
7. Ask a colleague for (early) feedback about the document (at this point this is when he was available) (link to partial doc) (5 min LP, 30 min colleague)
8. Revise draft incorporating colleague's feedback, and complete main document (link to partial doc) (30 min)
9. Ask ChatGPT to create executive summary for me (conversation link) (5 min)
10. Use ChatGPT to provide additional active learning activities, including AI-based ones (conversation link) (35 min)
11. Revise and complete methodological notes with links, etc. (15 min) -- the document is complete and ready to submit!

Total time: 3h45m