2.5 Cross-Curricular: AI-Assisted Lesson Design

AI-Assisted Instructional Design

Subject: Teacher Professional Development · **Target Group:** Teachers · **Duration:** 1 workshop (90 min) · **AI:** Teaching **WITH** AI

AI-related competencies (DUAL.AI.TEACHer Framework) – teacher level	**Subject-specific learning objectives – student/learner level**
AF-DR-2b *(AI Foundations and Applications × Digital Resources, Level 2 – Reflective Implementation)*: "Teachers can implement prompting, iteration, and refinement strategies to obtain usable AI-generated resources." **AF-TL-2b** *(AI Foundations and Applications × Teaching & Learning, Level 2 – Reflective Implementation)*: "Teachers can organise lesson elements that embed AI use with clear pedagogical roles and strategies to verify the output elements."	By the end of the lesson, participants can: • formulate a structured prompt for creating a learning activity in their own subject area; • evaluate an AI-generated activity for pedagogical relevance, accuracy and suitability for the target group; • identify elements of AI-generated material that require human verification or adaptation; • improve an initial AI output through prompting, iteration and manual revision; • integrate AI into a lesson while maintaining a clear pedagogical role for the teacher and learner. •

> **Take-home message:** Generative AI can accelerate lesson preparation, but a usable learning activity rarely comes from a single prompt. Effective AI-supported lesson design is an iterative process in which teachers define the pedagogical goal, generate ideas, evaluate the output, refine it and make the final instructional decisions.



Fig. 1: "AI-Assisted Instructional Design" (AI-generated image, ChatGPT GPT Image 2)

Content

Generative AI can support teachers with many tasks involved in lesson preparation, including generating activity ideas, adapting materials to different learner groups, producing examples and questions, or suggesting alternative ways of explaining a topic. The Latvian Datorium case study demonstrates this practical approach to teacher AI competence development: teachers first become familiar with AI and its educational applications and then move towards practical experimentation, lesson planning, assessment and differentiated material development. Classroom application is followed by reflection and feedback, making AI use part of an iterative professional learning process rather than a one-time technical exercise.

The usefulness of generative AI for lesson design depends heavily on the information and constraints provided by the teacher. A request such as "*Create a lesson about climate change*" leaves most pedagogical decisions to the AI system. A more structured prompt can specify the subject, learner age, existing knowledge, learning objective, duration, teaching method, available resources and expected learner output. Adding these elements does not guarantee a good lesson, but it gives the teacher greater control over what the AI produces and makes the resulting material easier to evaluate against the intended learning goal.

Even a detailed prompt can produce material that is factually inaccurate, pedagogically weak, unrealistic for the available lesson time or unsuitable for a particular group of learners. AI may suggest activities without considering classroom dynamics, assume resources that are unavailable, generate tasks that do not actually measure the stated learning objective, or provide content that appears convincing but requires factual verification. For this reason, AI-generated educational material should be treated as a draft rather than a finished teaching resource.

The central learning process in this activity is therefore not simply learning how to write a "good prompt". Teachers work through a repeated cycle of define → prompt → evaluate → refine → verify. They begin with a real learning objective from their own teaching context, use AI to propose an activity, evaluate the result against pedagogical criteria, refine the prompt where necessary and finally make their own modifications before the activity is considered classroom-ready. This reflects the Datorium case study's emphasis on practical experimentation, co-creation, classroom application and reflection, while keeping pedagogical responsibility and validation with the teacher.

Lesson plan

Phase	Time	Activity
Introduction	10 min	Participants identify one lesson-preparation task for which AI could potentially be useful. The facilitator introduces AI as an assistant/co-creator rather than an autonomous lesson designer.
Input	15 min	Participants compare a simple prompt with a structured educational prompt and examine how additional context changes the generated learning activity.
Exploration	15 min	Each participant selects a real learning objective from their subject and asks an LLM to generate a short classroom activity addressing it.
Adaptation	35 min	Participants work through two or three rounds of prompt → evaluate → refine → verify, progressively adding pedagogical constraints and checking the resulting activity.
Reflection	25 min	Participants compare their original AI output with the final classroom-ready version and identify which improvements came from prompting and which required their own professional judgement.

Guiding questions: from AI output to classroom-ready activity

1. **Round 1 — Define the pedagogical purpose:**
   Before prompting the AI, define:
   - Who are the learners?
   - What should they know or be able to do?
   - What prior knowledge do they have?
   - How much time is available?
   - What should learners actually do during the activity?

   Generate an initial activity and compare it with the intended learning objective.
   - *Diagnose:* Does the activity actually help learners achieve the objective, or does it merely relate to the same topic?
2. **Round 2 — Add classroom constraints:**
   Refine the prompt by adding realistic conditions such as class size, available materials, lesson duration, learner level, teaching method or accessibility requirements.
   Generate the revised activity and compare it with the first version.
   Compare: Check whether the generated dialogue follows each part of the instruction.
   - *Diagnose:* Which changes improved the activity? What classroom conditions has the AI still failed to consider?
3. **Optional round 3 — Verify and take back control:**
   Evaluate the final AI-generated activity for:

- factual accuracy;
- alignment with the learning objective;
- suitability for the learner group;
- realistic timing;
- clarity of instructions;
- accessibility and inclusion;
- teacher and learner roles.

Participants then make at least one manual change without asking AI to revise it.
The final comparison is therefore not "*Which prompt produced the best AI answer?*" but rather **"***What did the teacher have to contribute to turn an AI-generated idea into a usable learning activity?***"**

Closing question (for the Reflect phase): At which point did the AI-generated activity require more than simply improving the prompt, and what does this tell you about the teacher's role in AI-supported lesson design?

Follow with: If an AI-generated learning activity appears complete and well structured, how can you decide whether it is actually pedagogically appropriate and ready to use with learners?

Materials

- One laptop or tablet per participant, with a browser
- Access to an approved LLM chat interface, or a locally installed model
- One real learning objective or lesson topic from each participant's teaching context
- A structured educational prompting template
- A short worksheet for the define → prompt → evaluate → refine → verify cycle
- An evaluation checklist covering pedagogical relevance, accuracy, learner suitability, feasibility and alignment with learning objectives
- Example of a simple prompt and a more structured educational prompt

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