



P4ELECS
Platform for
Electrification Skills
& Competences

Quicksheet

How to integrate AI as teaching assistant?

Chloë Menten, Andy Veltjen - 30/4/2025





Benefits

- ✓ **Cognitive offload:** AI tools can take over routine or repetitive tasks, such as summarizing or reformulating texts—adjusting them for difficulty level or consistent language—allowing both teachers and students to focus on deeper learning processes.
- ✓ **Analysis of learning:** By processing learning data, AI can help monitor progress, detect learning gaps, and provide tailored feedback, supporting flexible and adaptive learning paths.
- ✓ **Extending thinking capacity:** AI can serve as a brainstorming partner, offering inspiration for exercises, case studies, or assignments, and thus supporting creativity and critical reflection.
- ✓ **Flexible learning & co-regulation:** AI systems can provide real-time feedback and scaffolding, supporting in managing your own learning process more effectively.

To make optimal use of these benefits, learners and educators need to develop key competencies such as AI-literacy, critical thinking, and self-regulation.

Step by step



Before

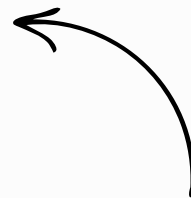
Before you start integrating AI as a teaching and learning assistant in the P4Elecs project, you have already reviewed the **Quality Guidelines** created in WP2.

In the following steps, **inspiration, and insights can help you effectively integrate AI tools into your development process.**

This quicksheet is based on the workshops provided by Bart Boelen (UCLL) during the general meeting in T2 Genk on 24/09/2024.

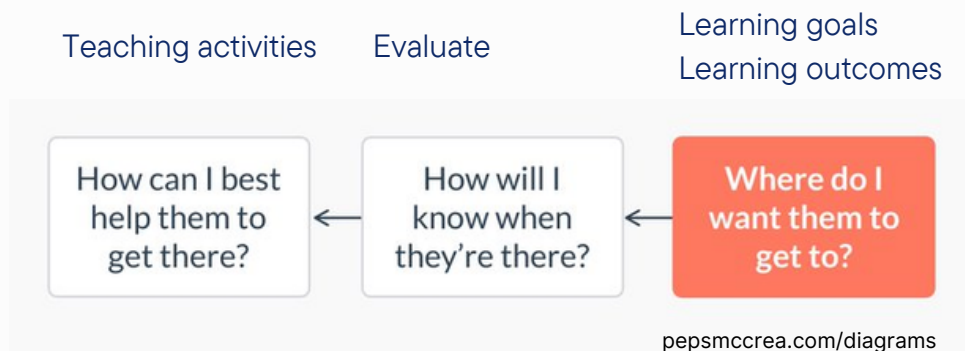
! **Research-Based strategies that strengthen the impact of teaching on learning**

1. Begin a lesson with a short review of previous learning.
2. Give clear and detailed instructions and explanations.
3. Present new material in small steps with student practice after each step.
4. Ask a large number of questions and check for understanding.
5. Provide models (of worked-out problems).
6. Guide students as they begin to practice.
7. Check for student understanding.
8. Provide scaffolds for difficult tasks.
9. Think aloud and model steps.
10. Provide systematic feedback and corrections.



References will be made to these strategies in the following steps.

Design learning experiences by backwards design.



- Identify what students need to know: Formulate clear and measurable learning objectives that align with curriculum requirements.
- Use backward design: Start with the end goal in mind and work backward to lesson activities

1. **Define the Learning outcomes**
2. **Specify how you will evaluate**
3. **Create suitable learning materials**

How can AI support you in this?

You can use one or more AI chatbots to insert a prompt. (Also check the workshop 'How to use AI during developing your BB' for more tools and tricks on prompt writing.)

Microsoft Edge - Copilot

ChatGPT – chat.openai.com

Perplexity – perplexity.ai

Gemini – [Gemini.google.com](https://gemini.google.com)

With the right prompt, various AI tools can support you in generating and structuring content. However, it is important to remember that **you as the expert determine the content direction**. AI provides support, but your role is to ensure the quality and relevance of the learning content.

I have to develop learning materials on the concept load balancing of small electric grids. Can you help me writing some learning goals on this concept for EQF 6 and 7?



EQF Level 7 (Master's Degree Level)

Learning Goals:

- Critically evaluate advanced load balancing strategies in small electric grids, including dynamic and real-time load management techniques.
- Develop and optimize algorithms or systems for load balancing in smart grids, incorporating renewable energy, storage, and demand response.
- Conduct research or case studies on the impact of load balancing on small grid resilience, cost-effectiveness, and energy efficiency.
- Integrate grid load balancing into broader energy management systems, addressing both technical and economic considerations.
- Design and implement advanced simulations or pilot projects for load balancing in microgrids, considering future energy trends (e.g., electric vehicles, decentralized grids).

These learning goals increase in complexity and depth across the levels, aligning with the higher-order thinking and practical skills expected at each EQF stage.



EQF Level 6 (Bachelor's Degree Level)

Learning Goals:

- Analyze the principles of load balancing in small electric grids and its importance in maintaining grid reliability.
- Compare various load balancing techniques (e.g., manual balancing, automated balancing systems) and their applications.
- Evaluate the performance of different grid configurations (e.g., radial, mesh) in terms of load distribution and balancing.
- Apply mathematical and computational tools to simulate and optimize load balancing in small electric grids.
- Assess the role of renewable energy sources and distributed generation in load balancing and grid management.

Can you make a multiple choice quiz of the article?



1. What is the primary goal of load balancing in an electrical grid?

- A) To increase electricity demand
- B) To ensure electricity supply matches demand
- C) To maximize energy production at all times
- D) To reduce the cost of electricity

Answer: B

2. Which of the following is a common challenge in load balancing, particularly with renewable energy sources?

- A) Renewable energy sources are always available.
- B) Renewable energy sources are unpredictable and vary in availability.
- C) Renewable energy sources always generate more than needed.
- D) Renewable energy sources cannot be stored.

Answer: B

Based on the EQF6 learning goals can you make an evaluation rubric on this topic?
Students need to check on their level of comprehension themselves.

Strategy 7. Check for student understanding



Criteria	Level 1 (Novice)	Level 2 (Developing)	Level 3 (Proficient)	Level 4 (Expert)
Understanding of Key Concepts	I struggle to explain the basic principles of load balancing.	I can explain some basic concepts but often confuse key terms like demand, generation, and grid stability.	I understand most of the key concepts, such as balancing supply and demand, but have trouble with more advanced ideas like frequency regulation.	I can clearly explain the principles of load balancing, including supply-demand matching, renewable energy variability, and grid stability.
Application of Load Balancing Techniques	I am not sure how load balancing techniques are applied in real-world grids.	I can list a few methods used in load balancing (e.g., adjusting power generation) but cannot apply them in specific scenarios.	I can apply load balancing techniques to basic scenarios, such as managing demand fluctuations, but struggle with more complex systems involving renewables or storage.	I confidently apply load balancing techniques, including managing demand-side strategies, renewable integration, and storage solutions, in complex grid scenarios.
Analyzing Challenges in Renewable Integration	I have difficulty understanding the impact of renewable energy sources on load balancing.	I understand some challenges related to renewable energy but cannot explain how these affect grid stability.	I can explain the challenges of integrating renewables into the grid, such as variability, but struggle to propose balancing strategies.	I analyze the challenges of renewable integration thoroughly, proposing effective balancing strategies to address intermittency and variability in power generation.
Understanding and Managing Frequency Deviations	I am not familiar with frequency deviations and how they relate to grid stability.	I have a basic understanding of frequency deviations but cannot explain how they are managed in load balancing.	I understand how frequency deviations occur and how load balancing helps maintain grid frequency within safe limits.	I fully understand the concept of frequency deviations and can explain in detail how various load balancing strategies, such as demand-side management and responsive generation, maintain grid stability.
Using Technology for Load Balancing (e.g., Smart Grids, Storage)	I am unfamiliar with the technological tools used in load balancing.	I know some technology used in load balancing, like smart grids, but I am unsure how they function in practice.	I can explain how smart grids and energy storage technologies help balance loads but struggle with detailed application in specific cases.	I fully understand how technologies like smart grids, storage, and real-time monitoring systems contribute to load balancing, and I can propose scenarios where these are effectively applied.
Evaluating Different Load Balancing Strategies	I struggle to compare different load balancing strategies.	I can list different strategies but cannot evaluate their effectiveness in real-world situations.	I can compare and evaluate some load balancing strategies, such as using traditional vs. renewable energy sources, but I find it difficult to assess their impact on overall grid stability.	I can evaluate and compare various load balancing strategies in depth, considering factors like efficiency, cost, environmental impact, and grid reliability.

What kind of active ways of learning can I implement in an online asynchronous course for a youtube fragment? How can I check for understanding?

Strategy 5. Provide models (of worked-out problems).

📌 Active Learning Strategies for YouTube Fragments in Asynchronous Courses

1. Interactive Video Activities

Tool examples: H5P, EdPuzzle, PlayPosit

How: Integrate the video with **embedded questions** that pause the video and prompt the learner to respond (multiple choice, short answer, polls).

Checks for understanding:

- Immediate feedback on quiz items
- Exportable results to LMS (e.g., Moodle or Canvas)

2. Reflective Journaling

How: After watching the fragment, students write a short reflection (text or voice). Use prompts like:

- "What surprised you most in this video and why?"
- "How does this content connect to your own experiences?"
- "What would you like to learn more about?"

Checks for understanding:

- Use a rubric assessing depth of insight, connection to content, and clarity.

3. Discussion Forum with Guided Prompts

How: Post the video in a forum with 1–2 critical thinking questions. Ask students to respond and comment on at least two peers.

Prompts examples:

- "Do you agree with the viewpoint expressed in the video? Why or why not?"
- "How would you explain this topic to someone who disagrees with the speaker?"

Checks for understanding:

- Evaluate participation using a rubric (argumentation, respect, relevance).

4. Compare & Contrast Exercise

How: Pair the YouTube fragment with another source (text, infographic, expert quote). Ask students to compare them.

Activity: Fill in a comparison table or write a short analysis.

Checks for understanding:

- Submit comparison + short explanation
- Peer review or instructor feedback on reasoning



Need some help with your prompts?

Tool	Link	Description
AI for Education	www.aiforeducation.io	Provides a variety of AI-generated prompts to assist with lesson planning, administrative tasks, assessments, and other educational activities.
Microsoft Prompts for EDU	github.com/microsoft/prompts-for-edu	A repository offering a range of education-focused prompts, including those designed for lesson creation, student engagement, and administrative tasks.

Useful tools to create lesson materials

Tool	Link	Description
Diffit for teachers	app.diffit.me	Generates student-ready resources such as worksheets, activities, and summaries tailored to different learning levels, helping educators save time in lesson preparation.
Miso	miso.ai	Allows educators to generate accurate answers and summaries based on their own expert knowledge, ensuring that content is factually correct and specific to course material.
NotebookLM (Experiment)	notebooklm.google.com	Creates new teaching materials, such as podcasts or summaries, by processing an educator's own content, making it easy to repurpose and extend lesson materials.



Good luck!