



AI Guide

ONLINE COURSE CONTENT

MODULE 1: AI TOOLS IN EDUCATIONAL CONTEXTS

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Artificial Intelligence for Green Understanding, Insights & Decision Empowerment



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AI tools in educational contexts

A. General Information

Module No	Module 1
Subtopic	AI tools in educational contexts
AI Literacy Component	Good knowledge of the available tools; each tool's capabilities in educational context; limitation of AI tools; connection to best-practice examples
Decision Making Skills	Selecting tools for teaching, learning and environmental decision tasks
Learning Objectives for STEM HE Teachers	Select appropriate AI tools for STEM teaching and learning activities while being aware of possible limitations
Learning Objectives for STEM Students	Use AI tools responsibly in learning tasks, without overusing them
Suggested AI Tools	Canva (Magic Studio); Gradescope; Mentimeter; AutoTutor; Elicit
Estimated Duration	60 minutes

B. Content for STEM HE Teachers

Highlights

After this subtopic, teachers should emphasise:

- AI tools in educational contexts extend well beyond chatbots, spanning content creation, assessment, research support, engagement, and adaptive tutoring
- Each category of tool serves a different pedagogical purpose, and choosing the right one is a decision-making skill in itself
- The AIGUIDE WP2-A3 Best Practices Report maps six categories of AI tools already piloted in STEM higher education contexts
- Evaluating a tool's data privacy, cost, accessibility, and evidence base matters as much as evaluating its features
- Well-chosen AI tools can scaffold structured, evidence-based green decision-making rather than simply automating tasks

Subtopic Content

Introduction

Having examined AI chatbots specifically in the previous subtopic, this subtopic widens the lens to the full range of AI tools available to STEM higher education teachers and students. Where Subtopic 1.3 focused on conversational, chat-based generative AI, this subtopic maps the broader toolkit identified in the project's WP2-A3 Best Practices Report against the wider research literature on AI in higher education: tools for content creation and presentation, assessment and feedback, writing and research support, classroom engagement, and adaptive or personalised learning. A systematic review of published research on AI applications in higher education found that the great majority of studies focused narrowly on adaptive systems, intelligent tutoring, and assessment (Zawacki-Richter et al., 2019), which is one reason this subtopic deliberately widens the discussion to the fuller range of tool categories STEM HE teachers now encounter.

From Chatbots to a Broader AI Toolkit

It is tempting to treat "AI in education" and "chatbots in education" as the same subject, but they are not. A chatbot is a single type of generative AI, optimised for open-ended conversation. Many of the AI tools now used in STEM higher education classrooms are built for a narrower, more specific job: generating a slide deck, grading a problem set, checking a citation, polling a lecture hall, or adapting the difficulty of a practice



problem to an individual student. This breadth matches how the AI landscape in higher education is often described: common uses already “span across the campus including personalised learning, virtual assistants and chatbots, learning analytics, grading, language translation, content and syllabus creation, research, and the admissions process” (EDUCAUSE, 2026), underscoring how far the toolkit extends beyond a single chat window. These tools often embed AI quietly inside a familiar workflow, such as a PowerPoint add-in or a learning-management-system quiz, rather than presenting it as an open conversation window. This broader view matters because a systematic review of empirical studies on AI chatbots in science education found that most existing research targets student interest and self-competence, while giving far less attention to whether these tools support genuine recognition as a capable, engaged learner, a gap that supports looking beyond chatbots to the fuller toolkit described below (Cheung, 2026).

This distinction matters pedagogically. A chatbot can, in principle, attempt any of these tasks if prompted correctly, but a purpose-built tool is typically faster to use, more consistent in its output format, and easier to evaluate against a specific instructional goal. Recognising which category of tool matches a given classroom need is therefore a foundational AI literacy skill in its own right, and one that STEM HE teachers can model explicitly for their students.

Watch: [AI Tool Demo: Turning Passive Video Watching Into Active Learning With SchoolAI \(Edutopia\)](#) to see one purpose-built classroom tool in action.

Six Categories of AI Tools Identified in the Best Practices Report

The AIGUIDE project’s WP2-A3 Best Practices Report conducted a structured review of AI tools used to engage learners in green decision-making, organising its findings into six categories. This kind of categorisation echoes the broader research literature, which similarly groups published applications of AI in higher education into a small number of recurring functions, including profiling and prediction, assessment and evaluation, and adaptive systems and personalisation (Zawacki-Richter et al., 2019). The first of the report’s six categories, Generative AI Assistants and Chatbots, covering tools such as ChatGPT, Claude for Education, and Gemini for Education, was addressed in the previous subtopic. The remaining five categories are the focus here.

Content Creation and Presentation Tools, such as Canva’s Magic Studio, ClassPoint AI, MagicSchool AI, Curipod, and Gamma, help teachers and students turn research or data into slides, infographics, worksheets, and interactive lessons in a fraction of the usual time. Assessment and Feedback Tools, such as Gradescope, EduAide.ai, Cognii, Quizizz AI, Turnitin Feedback Studio, and Formative, use AI to group similar student answers, generate rubric-aligned feedback, and surface patterns in class-wide misunderstanding. Writing and Research Support tools, such as Elicit and Consensus, help students and researchers search and synthesise peer-reviewed literature, draft and cite academic text, and check argument structure while preserving academic integrity norms. In a sustainability context, these tools can rapidly surface the existing peer-reviewed evidence base behind a proposed green intervention before students commit to a recommendation. Engagement and Interaction Enhancers, including Mentimeter, Slido, Wooclap, Poll Everywhere, and AhaSlides, use AI-supported polling, word clouds, and live question moderation to turn passive lectures into structured, evidence-based classroom debate. Adaptive and Personalised Learning tools, or intelligent tutoring systems, such as ALEKS, Knewton Alta, Möbius, CENTURY, and AutoTutor, adjust the difficulty and sequencing of practice material to each student’s demonstrated understanding, building the quantitative and conceptual foundation that later green-decision-making tasks depend on.

Watch: [Meet Magic Studio – Canva’s AI Features and](#)

Watch: [AI-Assisted Grading and Answer Grouping \(Gradescope, official\)](#) to see two of these tool categories demonstrated directly.

Mapping these categories against the report’s decision-making framework shows that different tools support different dimensions of decision-making: some strengthen evidence-based reasoning, others support scenario simulation, ethical reflection, sustainability data interpretation, or collaborative decision-making. No single tool covers every dimension, which is itself an important lesson for teachers selecting tools for a given lesson.

Matching Tools to Teaching Goals and Green-Decision Tasks

Selecting an AI tool should start from the pedagogical or decision-making goal, not from the tool itself. If the goal is to help students communicate a sustainability trade-off clearly, a content-creation tool such as Canva’s Magic Studio may be the right fit. If the goal is to give timely, consistent feedback on a large class’s



reasoning about a green case study, an assessment tool such as Gradescope or EduAide is more appropriate. If the goal is to surface the full range of student opinion on a contested environmental policy question in real time, an engagement tool such as Mentimeter or Wooclap is designed precisely for that purpose. If the goal is to build the underlying quantitative or conceptual fluency, for example in energy calculations or emissions accounting, that green decision-making later depends on, an adaptive learning system such as ALEKS or AutoTutor is the better starting point. If the goal is to ground a proposed green intervention in existing peer-reviewed evidence before asking students to argue for it, a research-support tool such as Elicit or Consensus is the more appropriate starting point than a general-purpose chatbot. This goal-first approach echoes recent practical guidance for instructors: such tools should “augment instructors’ capabilities”, streamlining routine tasks rather than replacing pedagogical judgment, with tool choice grounded in a specific evidence-based teaching goal before selecting the technology to support it (Schmitz & Laird, 2025).

This goal-first approach also helps teachers avoid two common pitfalls: adopting a tool simply because it is popular or novel, and asking a single familiar tool, most often a chatbot, to perform a task for which a purpose-built alternative already exists and performs more reliably.

The Rapid Growth of AI Tools in Higher Education

The number of AI tools marketed to educators expanded rapidly between 2023 and 2026. Many began as general-purpose writing or chat assistants and were later joined by a wave of purpose-built classroom tools: AI-powered slide generators, automatic quiz builders, plagiarism and AI-writing detectors, live polling systems with AI-generated insights, and adaptive tutoring platforms that had previously been available only to well-resourced institutions. This proliferation has real benefits, including lower-cost access to personalised feedback and content generation, but it has also created a fragmented landscape in which teachers must sort genuinely useful, well-evidenced tools from products with exaggerated claims and unclear data practices.

The AIGUIDE project’s Best Practices Report was compiled specifically to help STEM higher education teachers navigate this landscape: rather than reviewing every available product, it identifies a representative set of tools in each category, documents their functional capabilities, and analyses their relevance to evidence-based, ethical, and collaborative decision-making. Teachers new to this space are encouraged to treat the report, and the categories introduced in this subtopic, as a starting map rather than an exhaustive catalogue, since new tools continue to appear.

Evaluating AI Tools Critically Before Classroom Use

Before adopting any AI tool, STEM HE teachers should evaluate it against several practical criteria. Pedagogical alignment asks whether the tool’s output format, such as a quiz, a slide deck, or a tutoring dialogue, actually matches the learning objective at hand. Data privacy and compliance asks whether the tool meets relevant institutional and legal requirements, such as GDPR in the European Union or FERPA in the United States, particularly when student work or personal data is uploaded. Cost and access consider whether a tool’s free tier is sufficient for classroom use or whether a paid institutional license is required, and whether all students can access it equitably regardless of device or connectivity. Accessibility considers whether the tool works for students with disabilities and across language backgrounds. Accuracy and bias require checking whether a tool’s outputs, particularly automatically generated feedback or assessment scores, have been spot-checked against a human judgment baseline. These criteria echo concerns raised throughout the research literature on generative AI in education, including risks to data privacy, the perpetuation of societal biases, and the environmental cost of training and running large models (Kasneci et al., 2023). Finally, teachers should consider the environmental footprint of the AI systems themselves. Training and running large AI models consumes significant energy and water, an irony worth naming explicitly in a module about AI and green decision-making, and a reminder that tool adoption is itself a sustainability decision. This evaluation step matters because generative AI systems in general carry well-documented risks around bias, misinformation, and intellectual property that are easy to overlook when a tool’s output looks polished and confident, risks that a teacher’s own critical review is often the most practical safeguard against (Uddin et al., 2026).

Explore: [AI Basics for K–12 Teachers](#) (Common Sense Education), a free interactive course covering these evaluation habits in more depth.



Building Classroom and Institutional Readiness

Introducing a new AI tool into a STEM HE classroom works best as a staged process rather than a single switch. Teachers benefit from piloting a tool on a low-stakes task first, such as generating a single set of formative quiz questions, before relying on it for graded assessment. Institutions benefit from establishing a shared, transparent policy on which tools are approved for use with student data, so that individual teachers are not left to interpret data-protection obligations on their own. Peer support also matters: many of the tools catalogued in the Best Practices Report, such as MagicSchool AI and ClassPoint AI, include shared community libraries of lesson materials, allowing one teacher's well-evaluated use of a tool to become a template for colleagues rather than a one-off experiment.

Student-facing readiness deserves equal attention. Just as teachers should explain their reasoning for choosing a particular AI tool, students benefit from a brief, explicit orientation to any new classroom tool, covering what data it collects, what its outputs can and cannot be trusted to do, and how it fits into the assessment for the course. This transparency mirrors the same evidence-based, critically reflective habits that this module aims to build around green decision-making more broadly.

From Tool Adoption to Decision-Making Practice

Ultimately, no AI tool, however well chosen, replaces the teacher's own judgment about what a class needs (Schmitz & Laird, 2025), and the research literature continues to call for more evidence on how these tools actually affect learning outcomes at scale (Zawacki-Richter et al., 2019; Kasneci et al., 2023). The categories and examples introduced in this subtopic are best understood as a toolkit for scaffolding structured, evidence-based reasoning, not as a shortcut around it. Used deliberately, and cross-checked against the evaluation criteria above, these tools can help STEM higher education teachers give students more frequent, more consistent, and more actionable feedback on their green decision-making, freeing teacher time for the higher-value work of framing problems, facilitating discussion, and modelling critical judgment. The following sections connect these tool categories to concrete, real-world green decision-making practice, drawing directly on the scenarios and projects documented in the AIGUIDE WP2-A3 Best Practices Report.

Green Decision Context

AI tools used in educational contexts support green decision-making teaching in several concrete ways:

- content-creation tools turn environmental data and research into clear visual reports and presentations for stakeholders
- assessment tools identify, at scale, where students' reasoning about environmental trade-offs breaks down, enabling targeted re-teaching
- engagement tools turn passive lectures on contested sustainability questions into structured, evidence-based classroom votes and debates
- adaptive learning systems build the quantitative fluency, such as emissions or energy calculations, that green decision-making depends on

However:

- a tool's AI-generated feedback or content still requires teacher review before being treated as authoritative
- running AI tools has its own environmental cost, which teachers can raise as a discussion point rather than ignore
- the choice of which tool to use for a given lesson is itself a decision-making exercise worth making transparent to students

This decision-making framing mirrors a broader pattern in the science education literature: a systematic review of environmental socioscientific issues found that decision-making and argumentation are consistently the two most-targeted skills across studies, reinforcing that AI tools in this space should be judged by how well they build those specific skills rather than by novelty alone (Kumar et al., 2024).

Real World Examples

- **Canva Magic Studio in a STEM HE Environmental Policy Course:** a student team researching a city's transition to renewable energy uses Magic Write to draft a structured outline comparing wind versus solar deployment, Magic Media to generate infographics of carbon emission trajectories, and Magic Switch to translate the finished report for international stakeholders, mirroring authentic sustainability consulting practice.



- **Gradescope in a Large STEM HE Environmental Engineering Course:** an instructor uploads handwritten problem sets analysing the embodied carbon of three infrastructure scenarios; Gradescope groups similar student responses to “which scenario minimises embodied carbon, and why?” so that consistent feedback can be applied at scale, and analytics reveal that 60% of students omitted lifecycle considerations, prompting a targeted follow-up lecture.
- **Mentimeter in a Campus Decarbonisation Planning Session:** a lecturer asks students to vote on which criteria, cost, speed, emissions reduction, or technical feasibility, should be prioritised in a campus decarbonisation plan; a live word cloud and results display show where the class agrees and disagrees before a research-informed second vote, turning discussion into a visible, assessable decision-making activity.
- **AutoTutor in a Conceptual Reasoning Exercise on Climate Feedback Loops:** the intelligent tutoring system guides students to justify their own conclusions by asking “what is the rationale behind this conclusion?” and “on which assumptions is my decision based?”, building the evidence-based and ethical reasoning skills that later green decision-making tasks require.

Example Projects

- [BAIT-HEI: Brilliant Artificial Intelligence Toolkit – Higher Education Instructors](#) (2024-2027): builds academic staff competences in leveraging a broad toolkit of AI applications to design and develop learning content, directly matching this subtopic’s focus on AI tools beyond chatbots.
- [AISS – AI Solutions for Higher Education](#) (2023-2025): develops AI-based training modules, virtual assistants, and a toolkit of AI technologies to enhance multimedia curricula and support HE teachers and students, illustrating institution-wide adoption of the same categories of tools introduced here.

Recommended Readings

- [AI-Powered Pedagogy: A Guide to Evidence-Based Teaching Tools](#) – EDUCAUSE Review (2025).
- [Classroom Tools That Use AI](#) – Common Sense Education, a curated, reviewed list of AI tools across categories similar to those in the Best Practices Report.
- [AI Tools for Teachers to Try](#) – Edutopia.
- **AIGUIDE WP2-A3 Best Practices Report** (2026): the project’s internal state-of-the-art review of AI tools for green decision-making, the primary source for the Real World Examples and Example Projects above.

Videos/Interactive Resources

- [AI Tool Demo: Turning Passive Video Watching Into Active Learning With SchoolAI](#) – Edutopia video demo.
- [AI Basics for K–12 Teachers](#) – Common Sense Education, a free interactive training course.
- [Meet Magic Studio – Canva’s AI Features](#): a walkthrough of the content-creation tool referenced in the Real World Examples above.
- [AI-Assisted Grading and Answer Grouping](#) – Gradescope (official): demonstrates the assessment tool referenced in the Real World Examples above.

References

- AIGUIDE. (2026). AIGUIDE WP2-A3 best practices report: AI tools for green decision-making in STEM higher education. Artificial Intelligence for Green Understanding, Insights & Decision Empowerment (2025-1-LT01-KA220-HED-000354784).
- Cheung, K. K. C. (2026). Science Identity and AI Chatbots: A Systematic Review of Empirical Studies in Science Education. Journal of Science Education and Technology. <https://doi.org/10.1007/s10956-026-10295-8>
- EDUCAUSE. (2026). [Artificial Intelligence \(AI\)](#). EDUCAUSE Library.
- Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., et al. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. Learning and Individual Differences, 103, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Kumar, V., Choudhary, S. K., & Singh, R. (2024). Environmental socio-scientific issues as contexts in developing scientific literacy in science education: A systematic literature review. Social Sciences & Humanities Open, 9, 100765. <https://doi.org/10.1016/j.ssaho.2023.100765>



- Schmitz, A., & Laird, E. (2025). [AI-Powered Pedagogy: A Guide to Evidence-Based Teaching Tools](#). EDUCAUSE Review.
- Uddin, M., Arfeen, S. U., Alanazi, F., Hussain, S., Mazhar, T., & Rahman, M. A. (2026). A Critical Analysis of Generative AI: Challenges, Opportunities, and Future Research Directions. *Archives of Computational Methods in Engineering*, 33, 1763–1793. <https://doi.org/10.1007/s11831-025-10355-Z>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), 39. <https://doi.org/10.1186/s41239-019-0171-0>

C. Assessment and Practice Activities

The following activities give teachers concrete, measurable ways to check whether STEM higher education teachers can select appropriate AI tools while remaining aware of their limitations, and whether students can use AI tools responsibly without overusing them, the two learning objectives stated for this subtopic. They are designed to fit within the subtopic’s 60-minute estimated duration alongside the reading above.

Suggested 60-Minute Sequence

- 0–10 minutes: introduce the six categories of AI tools identified in the Best Practices Report using the “Six Categories of AI Tools Identified in the Best Practices Report” section and a linked video.
- 10–20 minutes: guided reading and discussion of the tool-evaluation criteria.
- 20–35 minutes: Activity (a), the tool-matching task.
- 35–50 minutes: Activity (b), the tool-evaluation exercise, scored with the checklist in Activity (c).
- 50–60 minutes: formative quiz and self-reflection, Activity (d).

(a) Tool-Matching Task

Give students four or five teaching or learning goals drawn from this subtopic, for example turning research into a stakeholder-facing infographic, giving consistent feedback on a large class’s reasoning about a case study, polling student opinion on a contested environmental policy question in real time, and building quantitative fluency in emissions calculations. Students match each goal to the AI tool category, content creation, assessment and feedback, engagement and interaction, or adaptive and personalised learning, best suited to it, and name a specific tool from the categories introduced in this subtopic. As a measurable outcome, students submit their goal-to-category matches with one sentence justifying each choice, directly assessing the learning objective of selecting appropriate AI tools for a specific activity.

(b) Evaluating a Tool Before Adoption

Provide students with a short, vendor-style description of a fictional or real AI tool being pitched for classroom use, written so that it omits or glosses over at least two of the evaluation criteria introduced above, for example no mention of data-privacy compliance, unclear pricing beyond a free trial, or no evidence of independent testing. Students evaluate the pitch against the criteria, pedagogical alignment, data privacy and compliance, cost and access, accessibility, and accuracy and bias, identifying which criteria the pitch fails to address and what question they would ask the vendor before recommending adoption. As a measurable outcome, students submit their evaluation against each criterion, marked as addressed, unclear, or missing, together with the specific follow-up question they would ask.

(c) Tool-Adoption Readiness Checklist

Teachers can use or adapt the following short checklist, scored yes / no / unsure, to assess a tool considered in Activity (b) or any new AI tool before classroom adoption:

- Does the tool’s output format match the specific learning objective it is meant to support?
- Has the tool’s data-privacy and compliance status, such as GDPR or FERPA where relevant, been confirmed rather than assumed?
- Is the tool’s cost and access model sustainable and equitable for every student in the class?
- Has the tool been checked for accessibility across disabilities and language backgrounds?
- Has at least one sample of the tool’s output been spot-checked against a human judgment baseline before relying on it?



(d) Formative Quiz and Self-Reflection

To close the lesson, students complete a short formative quiz aligned with the subtopic's learning objectives, for example:

- In one sentence, name one category of AI tool, other than a chatbot, and the kind of task it is best suited for.
- Give one evaluation criterion you would check before recommending an AI tool to a class, and explain why it matters.
- Describe one sign that a student, or a teacher, might be overusing an AI tool rather than using it responsibly.
- Reflect in two or three sentences: describe one specific task in your own studies where a purpose-built AI tool, rather than a general-purpose chatbot, would likely give a better result, and explain why.

Teachers can score the first three questions against a simple correct / partially correct / incorrect key and use the reflection question as a qualitative check that students can select and use AI tools responsibly in their own words, directly evidencing the student learning objective for this subtopic.

