GenESG

Immersive Learning Guide for AI Chatbots in Higher Education

Executive Summary

AI chatbots—especially those powered by large language models (LLMs)—can act as always-available tutors, simulators of real-world roles, and partners in inquiry-based learning. When designed intentionally, they enable immersive learning experiences that are interactive, contextualized, and highly personalized, going well beyond static content delivery or traditional e-learning modules[1][2].

For the GenESG project, AI chatbots are a central enabler of microlearning in sustainable finance and ESG. They can simulate stakeholder dialogues, expose students to complex decision-making under uncertainty, and support reflective practice on the ethical dimensions of finance. At the same time, their use raises concerns about bias, privacy, over-reliance, and academic integrity[3][4].

This guide provides professors and higher education institutions with:

- A concise conceptual foundation for immersive learning with chatbots
- Evidence-based benefits and limitations of AI chatbots in education
- An ethical and responsible-use framework aligned with current AIED guidelines
- Practical integration models and design patterns for courses and microlearning
- Sustainable finance/ESG-specific use cases tailored to GenESG
- Implementation guidance, checklists, and sample wording for course policies

The objective is to build methodological competence and confidence among educators who are unfamiliar with AI chatbots, enabling them to integrate these tools safely, effectively, and in alignment with GenESG's sustainability and AI literacy goals[5][6].

1. GENESG CONTEXT AND PURPOSE OF THE GUIDE

GenESG is an Erasmus+ project that bridges sustainable finance education with cutting-edge digital technologies in higher education, with partners from Austria, the Netherlands, Slovenia, Poland, and Bulgaria[5][6]. The project aims to:

- Identify gaps and needs in AI chatbot and ESG use in finance-related curricula

- Develop a skills pack and curriculum aligned with EQF for sustainable finance with AI

- Build a virtual academy and immersive learning guide to support educators

- Deliver a modular microlearning course integrating real-life ESG scenarios and AI tools[5][6]

Early research in GenESG shows that many finance programs in participating countries have only fragmented ESG content and ad-hoc use of AI tools. Obstacles include limited staff training, unclear institutional policies, and ethical concerns about AI in teaching[6].

This Immersive Learning Guide (WP2) addresses these gaps by:

- Demystifying AI chatbots for educators who are new to the technology

- Framing chatbots as low-threshold immersive learning tools, not just "answer machines"

- Providing concrete design patterns and examples in the context of sustainable finance and ESG

- Embedding ethical principles and AI literacy as core learning outcomes, not add-ons[3][6][7]

2. FOUNDATIONS: IMMERSIVE LEARNING AND AI CHATBOTS

2.1 What is Immersive Learning?

Immersive learning is a teaching and learning approach that integrates digital technologies with traditional methods to create realistic, engaging environments for experiential learning. It focuses on the quality and depth of the learning experience, not only on correct answers, and often uses simulated or artificial environments to replicate real-life scenarios[8].

Key characteristics include:

- High learner engagement and presence: Students feel "inside" a situation or problem rather than observing from the outside[8][9].

- Experiential and active learning: Learners practice skills, make decisions, and see consequences, often via simulations, role-play, or scenario-based tasks[8][9].

- Realism and contextualization: Scenarios are situated in realistic contexts that mirror professional practice, such as financial markets, boardrooms, or regulatory environments[8][9].

- Feedback and iteration: Learners receive immediate, contextual feedback, allowing them to test, fail safely, and try again[8][9].

Immersive learning is often associated with VR/AR and 3D simulations, but the underlying principle is deep contextual engagement and interaction. It can be achieved through text-based interactions, serious games, and narrative-driven role plays as well[8][9].

2.2 How AI Chatbots Enable Immersive Learning

AI chatbots can be considered "conversational simulators" that place the learner in the middle of complex situations:

- Role-based simulations: The chatbot plays an asset manager, regulator, NGO, corporate CFO, or retail investor in an ESG debate.

- Guided exploration: Students explore concepts (e.g., EU taxonomy, SFDR, climate risk) through interactive dialogue rather than passive reading.

- Decision-making scenarios: The chatbot presents a dynamic case where student choices influence the unfolding narrative (e.g., portfolio allocation under new climate policy).

- Socratic questioning: The chatbot asks probing questions, challenges assumptions, and requests justification, pushing learners to deeper reasoning.

Research on chatbots in education documents improved learning performance, active participation, self-regulated learning, and motivation when such tools are purposefully integrated[1][10]. For GenESG, chatbots offer a scalable way to create micro-simulations around sustainable finance cases, accessible on standard devices without specialized hardware.

3. BENEFITS AND OPPORTUNITIES OF AI CHATBOTS IN EDUCATION

Systematic reviews and empirical studies highlight several key advantages of AI chatbots in educational settings for both students and educators [1][3][11].

3.1 Benefits for Students

- Personalized and adaptive learning: Chatbots can tailor explanations, pacing, and examples to individual needs and knowledge levels, supporting differentiated instruction[1][3][11].
- Instant feedback and 24/7 availability: Learners can ask questions any time and receive immediate responses, which is especially valuable in self-paced or blended courses[1][3][11].
- Enhanced motivation and engagement: Interactive, conversational interfaces increase engagement and learning motivation, particularly when linked to realistic or gamified scenarios[1][3][11].
- Support for self-regulated learning: Chatbots can prompt goal setting, reflection, and self-assessment, reinforcing metacognitive skills[1][11].
- Language and communication practice: For international and multilingual cohorts, chatbots support writing, argumentation, and specialized vocabulary in finance and ESG[1][3].

3.2 Benefits for Educators and Institutions

- Scalable student support: Chatbots can answer routine queries, provide clarifications on course logistics, or guide basic conceptual review, freeing educator time for higher-value interactions[1][11].
- Cost-effectiveness: Once implemented, chatbots can serve large cohorts with relatively low marginal cost compared to purely human tutoring[1].
- Data-informed teaching: Interaction logs can reveal common misconceptions, frequently asked questions, and areas of confusion, guiding teaching interventions and curriculum refinement[3][11].
- Integration with immersive pedagogies: Chatbots complement VR/AR and simulations by adding narrative, decision-making, and reflection layers to immersive experiences[8][9][11].

3.3 Summary of Benefits

Dimension	Key Benefits
Student learning	Personalization, instant feedback, motivation, self-regulated learning[1][3][11]
Student experience	24/7 support, reduced anxiety about asking "simple" questions, language support[1][3]
Teaching practice	Reduced repetitive work, improved diagnostics, support for active learning designs[1][3][11]
Program level	Scalable tutoring, richer digital experiences, alignment with digitalization goals[5][6]

4. CHALLENGES, LIMITATIONS, AND RISKS

While promising, chatbots introduce non-trivial risks. Effective and ethical integration requires acknowledging and actively managing these limitations.

4.1 Pedagogical and Cognitive Risks

- Overreliance and reduced cognitive effort: Students may accept chatbot outputs uncritically or outsource thinking, which can undermine deep learning and critical reasoning[1][3][4].
- Potential reduction in human interaction: Excessive use of chatbots for support can erode meaningful student–teacher and student–student interactions, with implications for social and emotional development[3][4].
- Surface learning and "answer shopping": Without careful task design, students may use chatbots to generate final answers rather than engaging with the underlying reasoning process[4].

4.2 Technical and Information Quality Risks

- Inaccuracies and hallucinations: LLMs can produce plausible but incorrect or fabricated information, including in technical or regulatory areas such as sustainable finance[3][4][12].
- Bias and fairness issues: Models trained on large web corpora may reproduce or amplify existing social, cultural, or gender biases, including in ESG narratives and financial decision contexts[3][7][12].
- Limited domain adaptation: General-purpose chatbots may lack up-to-date or domain-specific knowledge on evolving ESG standards and regulations unless carefully prompted or supplemented.

4.3 Ethical, Privacy, and Trust Concerns

- Privacy and data protection: Students are often uncomfortable with their personal data being used to train or improve AI systems, even when they consent in principle[3][7][12].
- Academic integrity: Chatbots can facilitate plagiarism, ghostwriting, or unauthorized assistance if expectations and assessments are not redesigned[4].
- Unequal access and digital divide: Not all learners have equal access to reliable devices, connectivity, or assistive technologies, potentially exacerbating inequalities[3][7][12].

4.4 Adoption and Implementation Challenges

- Lack of AI literacy: Many students and educators have only superficial understanding of how LLMs work and what their limitations are; structured AI literacy curricula are still rare[3][6].
- Attitudes and resistance: Concerns about job displacement, academic integrity, and ethical misuse can reduce willingness to adopt chatbots in teaching[6][11][4].
- Maintenance and governance: Sustaining, updating, and monitoring chatbot implementations requires institutional support, governance models, and clear ownership[7][11][12].

Summary of Key Risks

Risk Area	Examples
Pedagogical	Overreliance, reduced critical thinking, less human interaction[1][3][4]
Technical	Hallucinations, outdated information, bias[3][7][12]
Ethical	Privacy breaches, unfair treatment, opaque decision-making[3][7][12]
Integrity	Plagiarism, unauthorized assistance, cheating[4]
Structural	Unequal access, limited staff capacity, lack of governance[3][6][11]

5. ETHICAL AND RESPONSIBLE USE FRAMEWORK

Ethical integration of AI in education requires explicit principles and practical guidelines. Syntheses of AI-in-education ethics propose principles such as beneficence, non-maleficence, autonomy, justice, and explicability as a basis for trustworthy AIED[7].

5.1 Core Principles for Ethical Chatbot Use in Education

Adapted to the educational chatbot context:

1. Beneficence (Do good)

   o Use chatbots to enhance learning, inclusion, and student wellbeing, not merely to reduce cost or automate surveillance[7].

2. Non-maleficence (Do no harm)

   o Avoid uses that increase stress, disadvantage vulnerable groups, or create harmful dependencies. Carefully manage hallucinations and bias[3][7][12].

3. Respect for Autonomy

   o Preserve students' agency to choose whether and how to use chatbots, and ensure they are not coerced into data-sharing or automated profiling[3][7].

4. Justice and Fairness

   o Ensure that chatbot-supported learning does not systematically disadvantage certain groups (e.g., by language, background, disability)[3][7][12].

5. Transparency and Explicability

   o Explain how the chatbot works in broad terms, what data it uses, and what its limitations are; document when and how its use is allowed in coursework[4][7].

6. Accountability

   o Human educators and institutions remain responsible for pedagogical and ethical outcomes; AI systems should not be treated as autonomous actors[4][7].

7. Sustainability and ESG Alignment

   o In a sustainable finance context, consider environmental footprints of AI, as well as the social and governance dimensions of relying on proprietary platforms. Use this as a critical discussion point in class[5][6][13].

5.2 Embedding AI Literacy and Ethics into Teaching

A curriculum that explicitly teaches LLM concepts and ethical usage significantly improves students' understanding and technology acceptance, but also reveals that younger students may over-trust AI outputs[3].

For GenESG-aligned courses, a **short AI literacy and ethics module** is recommended early in the semester or before intensive chatbot use, covering:

- What LLMs and chatbots are (and are not)
- Typical strengths and weaknesses (hallucinations, bias, outdated data)
- Data protection and privacy, especially in EU/GDPR context
- Academic integrity: what constitutes acceptable vs unacceptable AI assistance
- Responsible use in decision support (including financial decisions)[3][4][7]

This module can itself leverage chatbots (e.g., by asking students to identify flaws or biases in AI-generated outputs), turning the technology into both content and object of critical inquiry.

5.3 Practical Ethical Guidelines for Educators

Educators can operationalize the principles via the following practices:

- Be transparent with students: Clearly state when and how chatbots may be used, and require disclosure of AI assistance in submissions[4][12].
- Minimize personal data: Instruct students never to share personal, sensitive, or identifiable information about themselves or others with public chatbots[3][4][7][12].
- Use human-in-the-loop designs: Require human judgment at critical points—e.g., students must critique chatbot outputs, not just submit them[4].
- Promote critical engagement: Encourage fact-checking, source triangulation, and explicit reflection on where the chatbot may be wrong or biased[4][12].
- Align with institutional policy and law: Ensure that chatbot use is consistent with institutional AI guidelines, Erasmus+ requirements, and GDPR.

6. PEDAGOGICAL INTEGRATION MODELS

AI chatbots can support learning at multiple levels: course design, individual sessions, and assessment.

6.1 Course-Level Integration

At the course level, chatbots can function as:

- Virtual tutors: Offering explanations, examples, and practice questions aligned with course content.
- Microlearning companions: Supporting GenESG-style short learning units with focused interactions (e.g., 10–15 minute chatbot-based exercises).
- Advisors for projects: Helping students brainstorm project ideas, structure research, or explore ESG data sources (with critical oversight).

Implementation tips:

- Map chatbot activities explicitly to learning outcomes and EQF descriptors (e.g., analysis, evaluation, communication).
- Introduce chatbots gradually, starting with low-stakes tasks (e.g., brainstorming, explanation) before high-stakes tasks.
- Use your LMS or virtual academy as the main access point where possible, to centralize guidance and resources[5][6].

6.2 Session-Level Integration

Within specific class sessions or workshops, chatbots can enable:

1. Explain–Apply–Reflect sequences

   - Explain: Students ask the chatbot for explanations/examples of a concept (e.g., "double materiality in sustainability reporting").
   - Apply: Students work on a mini-case or calculation, possibly with limited chatbot assistance.
   - Reflect: Students compare their reasoning with chatbot suggestions and critique differences.

2. Live role-play

   - Pairs or groups interact with a chatbot playing an ESG stakeholder during in-class exercises, and then present key insights or conflicts to peers.

3. **Concept conflict exploration**

- Students prompt the chatbot to argue both for and against a sustainability decision (e.g., divesting from a controversial sector), then evaluate argument quality.

6.3 Assessment-Level Integration

Given risks to academic integrity, careful distinction between formative and summative use is crucial[4].

- **Formative assessment**:
  - o Chatbots can support drafts, feedback, and practice questions. Students should document how they used AI and provide their own commentary on its usefulness and inaccuracies.

- **Summative assessment**:
  - o Avoid enabling unsupervised chatbot use in tasks that primarily test recall or straightforward problem-solving.
  - o Design assessments that require personal reflection, contextual data, or real-world engagement that AI cannot easily fabricate[4].
  - o Use oral defenses, process logs, or iterative submissions to verify authentic learning.

7. DESIGNING IMMERSIVE CHATBOT EXPERIENCES: GUIDELINES AND PATTERNS

This section offers a practical design process educators can follow, independent of specific platforms.

7.1 Step 1 – Start from Learning Outcomes (EQF Alignment)

- Identify the knowledge, skills, and competences targeted (e.g., at EQF level 6 or 7):
    - Knowledge: explain key ESG frameworks; understand sustainable financial instruments.
    - Skills: analyze corporate ESG performance; interpret sustainability disclosures.
    - Competence: make and justify investment decisions under uncertainty and ethical constraints.
- Frame chatbot tasks so that students **must practice these outcomes**, not just read about them (e.g., "justify your recommended portfolio adjustment to a skeptical regulator persona").

7.2 Step 2 – Define the Chatbot's Role and Persona

Clearly decide what role the chatbot plays:

- Tutor/coach: Offers hints, asks guiding questions, suggests resources.
- Stakeholder persona: Regulator, shareholder activist, NGO representative, corporate CFO, retail client.
- Simulator: Simulates market conditions, policy changes, or ESG events and reacts to student decisions.
- Critic or peer reviewer: Critiques student arguments, asks for evidence, points out missing dimensions (e.g., social vs environmental).

Explicitly communicating this role to students enhances immersion and clarifies expectations.

7.3 Step 3 – Structure the Interaction in Phases

Design interactions to follow a predictable structure:

1. Briefing:
    - Provide context, roles, and objectives.
    -

- o Example: "You are an ESG analyst at a mid-sized asset manager. A client is considering investing in Company X; your task is to advise them."
2. Exploration:

  - o Students question the chatbot and collect information or perspectives.

3. Decision and justification:

  - o Students make a decision (e.g., invest or not; adjust portfolio; recommend engagement strategy) and justify it to the chatbot persona.

4. Critical debrief:

  - o Students step back, evaluate the chatbot's contributions, identify any inaccuracies or biases, and reflect on how they would do things differently.

7.4 Step 4 – Design System and User Prompts

For educators using configurable chatbots, a system prompt (hidden from students) can embed pedagogical and ethical constraints, such as:

"You are an AI tutor supporting university students learning sustainable finance and ESG. Your goals are to:

– Ask questions that prompt critical thinking rather than giving final answers immediately.
– Encourage students to explain their reasoning and reflect on trade-offs.
– Explicitly disclose when you are uncertain or may be hallucinating.
– Remind students to verify important facts and consult primary sources (e.g., regulations, official reports).
– Never request or store personal or sensitive data."

Student-facing starting prompts can then define the situation and expectations:

"Explain the scenario to the chatbot and ask for its perspective, but do not copy its output directly. Use it to challenge and refine your own ideas. Summarize at the end what you found most useful and what you disagreed with."

7.5 Step 5 – Build Scaffolds and Metacognitive Elements

To prevent overreliance and encourage critical thinking:

- Require students to highlight at least one error, omission, or bias in the chatbot's response.
- Ask them to compare chatbot suggestions with at least one other source (e.g., academic article, regulation, company report).
- Include short reflection prompts: "What did the chatbot help you see that you might have missed? What did it overlook?"

7.6 Step 6 – Ensure Accessibility, Inclusion, and Data Protection

- Provide clear instructions and alternative routes (e.g., if a student cannot or does not wish to use a particular commercial chatbot, offer institutional or offline alternatives).
- Encourage use of multilingual capabilities to support students whose main language is not the course language, while reminding them to critically check translations.
- Explicitly instruct students not to enter personal data, confidential information, or proprietary datasets into third-party tools[3][4][7][12].

8. SUSTAINABLE FINANCE AND ESG USE CASES

The following scenarios illustrate how chatbots can enable immersive microlearning experiences directly aligned with GenESG goals.

8.1 "Ask the ESG Analyst" Micro-Tutor

Objective: Support foundational understanding of ESG concepts and frameworks.

- Role: Chatbot acts as a senior ESG analyst.
- Activity: Students ask targeted questions about concepts such as double materiality, EU taxonomy, SFDR, green bonds, etc.
- Immersive element: The chatbot responds using examples from realistic (or anonymized) company situations and asks students to explain back in their own words.
- Critical layer: Students must submit a short summary of one explanation and note one point they cross-checked in an external source.

This fits within GenESG microlearning modules as a pre-class or between-class activity[5][6].

8.2 ESG Investment Case Lab

Objective: Practice ESG integration into investment decisions.

- Role: Chatbot plays a simulated **investment committee chair**.
- Scenario: Students are given a short case describing two companies with different ESG profiles and financial metrics.
- Activity:
    - Students propose a portfolio allocation and reasoning.
    - Chatbot challenges them on missing ESG dimensions (e.g., supply chain risks, social issues) and asks for justification.
- Deliverable: A brief written memo to the committee summarizing their recommendation and how they responded to the chatbot's challenges.

This scenario targets higher-order EQF skills: analysis, evaluation, and complex problem-solving.

8.3 Stakeholder Dialogue on a Controversial Project

Objective: Explore ethical, social, and governance dimensions of sustainable finance decisions.

-

- Role: Chatbot plays an NGO representative, community member, or journalist questioning a bank's decision to finance a controversial infrastructure project.
- Activity:
    - Students act as bank sustainability officers, engaging in a dialogue with the chatbot.
    - They must explain the bank's due diligence, risk mitigation, and stakeholder engagement strategy.
- Debrief:
    - Class discusses where the chatbot raised legitimate concerns, where it missed nuance, and how this reflects real stakeholder dynamics.

This setup emphasizes the "S" and "G" in ESG, not only environmental metrics[5][6].

8.4 Regulation and Policy Exploration Companion

Objective: Enhance understanding of complex regulatory frameworks without treating the chatbot as an authoritative legal source.

- Role: Chatbot is a "policy explainer" with explicit disclaimers that it is not a legal authority.

- Activity:
    - Students ask for summaries and comparisons of elements of EU sustainable finance regulation (e.g., SFDR vs EU taxonomy) and then locate and read the primary regulatory text.

- Safeguards:
    - Students must quote actual regulation text in their assignments and note any discrepancy between chatbot explanations and official sources.

This approach leverages chatbot strengths in simplification and analogy, while maintaining respect for authoritative legal documents.

8.5 Greenwashing Detection Exercise

Objective: Develop critical thinking around sustainability claims and AI-assisted analysis.

- Role: Chatbot acts as an ESG screening assistant evaluating sustainability claims of a hypothetical company.
- Activity:
  - Students provide the chatbot with a company description and some marketing content.
  - The chatbot classifies the risk of greenwashing and provides justification.
  - Students critique its assessment, using external ESG reports, media, or NGO assessments.
- Outcome:
  - Students write a short reflection on where the chatbot was overly optimistic, overly skeptical, or balanced.

This use case aligns directly with research on using AI to detect greenwashing and assess ESG disclosures in sustainable finance[5][6][13]

9. IMPLEMENTATION ROADMAP FOR EDUCATORS AND INSTITUTIONS

A structured adoption process reduces risk and builds capacity progressively.

9.1 Phase 0 – Policy, Awareness, and Capacity Building

- Map institutional AI policies, data protection guidelines, and any national regulations relevant to educational AI use.
- Organize faculty workshops introducing AI chatbots, their capabilities, and risks.
- Share examples from the GenESG study on how universities in participating countries are beginning to integrate AI and ESG in curricula[6].

9.2 Phase 1 – Low-Risk Pilots

- Start with voluntary, low-stakes chatbot activities (e.g., concept exploration, formative quizzes, reflection prompts).
- Select 1–2 courses in sustainable finance or related areas where instructors are motivated to experiment.
- Collect qualitative feedback from students and educators to understand perceived usefulness, challenges, and ethical concerns[3][6][4].

9.3 Phase 2 – Structured Integration and Scaling

- Refine course designs to include clearly documented chatbot-based learning activities, aligned with learning outcomes and assessment strategies.
- Develop shared templates, prompts, and personas that can be reused across the GenESG virtual academy.
- Establish ongoing governance:
  - o Responsibility for monitoring tool performance and updating guidance.
  - o Mechanisms for addressing incidents (e.g., harmful or biased outputs).
  - o Continuous AI literacy offerings for new cohorts[6][7][4].

10. PRACTICAL GUIDANCE FOR DAY-TO-DAY USE

10.1 Suggested Classroom and Assignment Practices

Before activity:

- Clearly state learning objectives and why a chatbot is being used.
- Remind students of privacy, ethical, and academic integrity expectations.
- Provide a short "how-to" guide and example prompts.

During activity:

- Encourage students to think aloud or keep a brief log of their interaction (e.g., key prompts and responses).
- Walk around (or monitor online) to observe patterns and intervene when necessary.
- Ask groups to note one "insight" and one "problem" from their chatbot interaction.

After activity:

- Facilitate whole-class debrief: What worked? What was misleading?
- Connect experiences back to theory (e.g., limits of AI, ethical issues, human judgment).
- Collect short feedback surveys to iteratively improve the design.

10.2 Sample Syllabus Statement on AI Chatbot Use

Educators can adapt wording such as:

> "In this course, we will use AI chatbots (e.g., educational conversational agents) as a tool to support learning in sustainable finance and ESG. These tools can help you explore concepts, practice skills, and engage in simulated stakeholder dialogues.
>
> You are responsible for critically evaluating any output produced by AI tools and must not present AI-generated content as entirely your own work. You are required to:
>
> – Disclose when and how you used AI tools in your assignments.
> – Avoid entering personal or confidential information into AI systems.
> – Verify important facts with authoritative sources (e.g., academic literature, regulations).
>
> Unacknowledged or inappropriate use of AI tools may be treated as a violation of academic integrity."

10.3 Student-Facing Ethical Use Guidelines (Short Version)

1. Use AI to understand and practice, not to replace your thinking.

2. Always double-check facts and numbers with reliable sources.

3. Never share personal, sensitive, or confidential information.

4. Be transparent about your AI use in assignments.

5. Treat AI outputs as starting points for critical thinking, not final answers[3][4][12].

11. CHECKLISTS FOR EDUCATORS

11.1 Pre-Design Checklist

- [ ] Learning outcomes defined and mapped to EQF.
- [ ] Rationale for using a chatbot (not just "because it's available").
- [ ] Ethical principles considered (beneficence, fairness, transparency, privacy)[7].
- [ ] Institutional policies reviewed; GDPR and data protection constraints understood[3][7][12].
- [ ] AI literacy and ethics module planned or integrated[3][4].

11.2 Activity Design Checklist

- [ ] Clear role and persona defined for the chatbot.
- [ ] System and student prompts designed to elicit higher-order thinking.
- [ ] Structure includes briefing, exploration, decision, and debrief.
- [ ] Built-in scaffolds for critical evaluation of AI outputs.
- [ ] Accessibility and alternative pathways considered.

11.3 Delivery and Evaluation Checklist

- [ ] Students briefed on expectations and ethical use.
- [ ] Mechanism for students to report problematic chatbot behavior.
- [ ] Debrief session conducted; insights linked to course content.
- [ ] Student feedback collected on learning value and concerns.
- [ ] Results and lessons fed back into course and program design[6][4][11].

CONCLUSION

AI chatbots can be powerful enablers of immersive learning when framed not as answer machines but as partners in dialogue, simulation, and reflection. For GenESG, they provide a concrete way to bring sustainable finance and ESG challenges into the classroom through rich, interactive microlearning experiences that mirror real-world complexity.

However, their pedagogical value depends entirely on thoughtful, ethically grounded design. Educators must combine clear learning outcomes, critical AI literacy, careful role and prompt design, and robust debriefing practices to ensure that chatbots enhance rather than erode students' analytical skills, autonomy, and integrity[1][3][4][7][11].

By following the methodologies, examples, and checklists in this guide, professors can take confident first steps toward integrating AI chatbots into their teaching, and, over time, co-create with students a responsible, innovative, and sustainability-oriented digital learning culture aligned with the aims of the GenESG project[5][6][13].

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