COURSE DESIGN AND GENERATIVE ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION

FOUNDATIONS OF COURSE DESIGN

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Course Design and Generative Artificial Intelligence in Higher Education

Introduction

This document provides a concise overview of how generative artificial intelligence tools (GenAI) can enhance higher education course design creating effective and equitable learning experiences for our students (Teach Access, 2025). Whether you are beginning to explore AI or seeking to enhance an existing course, this resource provides structured guidance for meaningful, intentional, and ethical integration of GenAI tools.

This resource is organized into three phases—Explore, Engage, and Expand (Kenny et al., 2017) —which may help instructors consider the impact of GenAI as a tool for course design, integrate GenAI tools into their course design, or refine their course design practices.

Explore: Elements of Effective Course Design

Effective course design in higher education integrates clear learning objectives, aligned assessments, engaging teaching and learning activities, and inclusive pedagogy to support diverse learners.

Gen AI tools may help streamline a course design workflow while incorporating evidence-based practices (Pereira et al., 2024). The framework for integrating GenAI tools into course design emphasizes the importance of formulating clear and aligned learning outcomes. GenAI tools may support instructors to establish and refine these outcomes, ensuring they resonate with the course content and assessment methods while incorporating elements of Bloom's Taxonomy for comprehensive cognitive skills coverage (Pereira et al., 2024; Gonsalves, (2024).

Engage: Integrating AI into course design

GenAI can assist course design in every stage, depending on where you are in your course development process. We will explore various ways to integrate AI in the essential components of course design: writing learning outcomes, student assessment, and teaching and learning activities.

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Write Learning Outcomes:

A well-structured course begins with defining measurable learning outcomes that align with institutional goals and accreditation standards. The integration of GenAI in creating learning outcomes may assist with alignment between learning outcomes, learning activities and assessment.

Where to get started?

The following are a few recommendations to engage with GenAI research and learning outcomes:

- **Theoretical Foundations:** Revisit Bloom's Taxonomy as it applies to AI integration (e.g., Oregon State University Ecampus, 2024) to ensure alignment with cognitive objectives from remembering to creating.
- **Research Insights:**
  - Explore studies such as Boubker (2024) that analyze AI's evolution from basic chat functionalities to self-educating systems.
  - Consider Gonsalves (2024), which discusses how GenAI can promote higher-order thinking skills.

Design Active Learning Strategies for students to use GenAI

Teaching and learning activities should employ active learning techniques, leveraging technology and evidence-based practices to foster deep engagement. When students have opportunities to practice with GenAI tools through guided learning activities, not only may they increase their GenAI literacy, but learners also recognize the need for critical awareness of the biases and challenges with using these tools (Hawk et al., (2025).

Where to get started?

The following are a few recommendations to engage with GenAI research and learning activities:

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Learning Activities:

- **Role-playing activities:** GenAI-driven role-playing activities may enhance the learning experience by increasing the capacity to consider and contrast how students approach the scenario (McGovern, 2024).
- **Collaborative Projects:** Encourage group work where AI platforms assist students in team cohesion and collective thinking, supporting learning at multiple cognitive levels (Perifanou et al., 2025).
- **Flipped Classroom Models:** Utilize AI-generated content such as quizzes or interactive modules for pre-class engagement, enabling richer, in-depth classroom discussions (Reinke et al., 2025).

Assessment Practices and GenAI

Assessments should provide valid and reliable measures of student learning, incorporating formative and summative approaches to enhance knowledge retention and skill development. Assessment practices and GenAI have led to complexities in assessment design, implementation, and managing misconduct (Luo et al, 2025).

Where to get started?

The following are a few recommendations to engage with GenAI research and assessment practices:

Formative Assessments:

- Use AI-powered assessment management tools, like Gradescope, that assess and sync grades in D2L.

Future-focused, skills-based assessments:

- Design assignments that reflect real-world challenges, using AI to generate case studies or projects that require critical thinking and synthesis (Upsher et al., 2024)

Innovative Frameworks:

- Employ models like the 6-P Pedagogy (Plan, Prompt, Preview, Produce, Peer-review, Portfolio Tracking) in academic writing (Kong et al., 2024) and synthesis-based assignments (Dguidegue, 2025).

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- Use the PAIR (Problem, AI, Interaction, Reflection) Framework to support students with finding the balance between using GenAI intentionally and not developing an over-reliance on these tools (Acar, 2023).

Reflective Inquiry:

- **Descriptive Analysis:** Document the context in which GenAI is used. What tools were implemented? What actions were taken?
- **Case Studies & Examples:**
  - Examine specific AI tools like SMARTIE, designed to help educators develop inclusive course learning activities and rubrics.
  - Analyze cross-disciplinary applications, noting both the benefits and challenges of integrating GenAI in various academic settings.

Expand: Reflecting, Refining, and Innovating

Actionable Insights for Future Course Design

- **Reflect and Iterate:** Use insights gained from exploring and engaging with GenAI to develop actionable strategies for continuous improvement. What adjustments can be made to better integrate GenAI in future courses?
- **Strategic Enhancements:**
  - **Resource Development:** Leverage institutional supports such as the Taylor Institute for Teaching and Learning Resource Library for updated resources on GenAI and teaching and learning.
  - **Professional Development:** Engage with the Centre for Artificial Intelligence Ethics, Literacy and Integrity to stay current on emerging trends and best practices.
  - **Continuous Feedback:** Create systems for ongoing feedback from both instructors and students to guide iterative course refinement.

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Future Directions and Research Support

- **Curricular Innovation:**
    - Adopt best practices from studies like Salinas-Navarro et al. (2024) that highlight experiential learning with GenAI tools.
    - Explore interdisciplinary applications of GenAI to enhance course design across diverse fields.
- **Ethical Considerations and Integrity:**
    - Foster a culture of ethical inquiry and continuous discussion about the implications of GenAI in education.

Reflective Inquiry:

- **Implementing Change:** Develop clear, step-by-step strategies for applying insights from your AI experiences into new course designs.
- **Collaboration and Networking:** Emphasize the importance of building networks, such as Conversations about Artificial Intelligence and your Courses, among instructors to share best practices and collaborate on GenAI-focused projects.

Conclusion

Kenney's et al. (2017) Explore, Engage, Expand framework transforms course design into a dynamic, iterative process. By first exploring the potential of GenAI, then engaging students and faculty through active learning and innovative assessments and finally expanding upon these insights through continuous reflection and improvement, instructors can design courses that are both effective and inclusive.

This approach ensures a reflective and iterative approach to integrating GenAI in course design, leading to more effective and personalized learning outcomes for students.

Contact us: Taylor Institute for Teaching and Learning

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