



Best Practices for Course Design and Instruction

From the Faculty Committee on the Future of Technology-Enhanced Education
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A. In-Person, Hybrid, or Online Courses

Innovative pedagogy

1. Align student activities and assessments with desired learning outcomes, and articulate up front the knowledge, skills, and attitudes that students should have after successfully completing the course.
2. Incorporate instructional approaches, formats, techniques, and tools that are current and informed by research, such as project-based, active and multi-modal learning.
3. Spend classroom time teaching methods, concepts, skills, and practices, rather than facts.
4. Support students' need for computational literacy in order to help them to master technical skills, as well as to think and identify and answer questions in the context of contemporary tools and resources.
5. Provide immediate feedback. (The more immediate the feedback, the more effective it is in aiding students' learning.)

Authentic and reflective learning experiences

6. Introduce students to tools and skills integral to analyzing data and contextualizing course themes, and offer rich opportunities for student engagement, problem solving, and research.
7. Promote self-reflection and allow for students' personalization of the subject matter, such as location-based field work as well as other hands-on activities..
8. Promote student use of learning portfolios.

Student-centered course development and instruction

9. Encourage and provide tools to support student discussion and collaboration.
10. Scaffold learners with diverse skills, learning styles, and knowledge levels (i.e., offer differentiated instruction, giving novice learners information and support they need, without slowing down advanced learners, who can go right to what they need)

Assessment

11. Promote continued and distributed learning, not “cramming”—e.g., by incorporating more low-stake quizzes, cumulative tests, individual or group projects, writing, and portfolios supported by rubrics.

12. Use multiple approaches—e.g., machine grading (multiple choice, numerical computations), including the use of Scantron item test banks and of “clickers” (to assess students’ understanding of concepts as they are being presented); instructor grading (open-ended responses); peer grading and “teach-back” strategies; self-assessment; multimodal activities (to address different learning preferences); and assessments embedded both within and after modules.

13. Incorporate both formative assessments (i.e., gathering feedback from students that can be used to guide improvements) and summative assessments (i.e., measuring the level of success or proficiency in the subject matter at multiple points during a course, as well as at the end).

B. Components That Can Increase the Effectiveness of a Hybrid and/or Online Course

Data-driven design and analytics

1. Incorporate learning analytics of student performance, evaluations, and observable actions to inform the design of the learning experience, content, and student interactions.

Attention to online user interface/experience

2. Conceptualize and design instructional digital materials and online platforms with a focus on the cognitive experience of the learner—ensuring, e.g., that the navigation is intuitive; that there is a balance between text and graphics; that the visuals do not hinder the learning process; that there is sufficient “white space”; that fonts and layouts are consistent; that information is “scannable” to the eye; and that content is appropriately “chunked.”

Communication

3. Incorporate multiple approaches to communication—e.g.:

- *Video*—using short segments (2-5 minutes) in a variety of formats, with audio narratives (to enable students to follow instructors as they move across lists, illustrations, and charts) and searchable transcripts (to facilitate review);
- *Graphic animations*—particularly for information that is visual, dynamic, three-dimensional, or spatial;
- *Interactive simulations, gaming, and virtual worlds*—using simulation, modeling, and forecasting to enhance explorations of real-world data and phenomena, and/or role-playing and case studies, to enhance the dynamics of participation in a parallel environment; and
- *Other visual presentation formats (e.g., PowerPoint, Keynote Lessons, or online modules/sites)*—ensuring that slides/pages are cleanly presented, one at a time, with iconic imagery or unique media, and with limited crowding of images, text, or listed bullets.

Online collaborative learning

4. Incorporate discussion, group work, and sharing, using both synchronous and asynchronous communication tools.
5. Encourage learners in an online course to reflect on and gain new experiences in their online and offline communities and utilize those experiences in the course.

Student engagement and assessment

6. Communicate actively with students online, offering quick and regular feedback (e.g., using feedback tools included with word processing software and posting graded assignments back to the learning management system), responding promptly to student queries, posting regular announcements, and providing motivational support. (A powerful feature of technology-based assessment and intelligent tutoring systems is the ability to generate automated and immediate feedback.)

Technical and course delivery support

7. Ensure that students have access to training (face-to-face and/or online) and support, so that they can use instructional tools effectively.
8. Build in contingency plans for technical difficulties.