Chapter 8
Engaging Students in Online Environments

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"I never teach my pupils, I only attempt to provide the conditions in which they can learn."
– Albert Einstein

Einstein's influential words about teaching resonate with many instructors' experiences. Whether teaching an online introductory class in physics or a capstone course in anthropology, instructors often say their greatest joys come from moments when students take advantage of the class environment to seize ownership of their learning. While some of these moments may happen by chance—an alignment of a developmental moment in a student's life and a responsive teacher—there is evidence that classes can be designed for this kind of student-centered learning, known as *active learning* (Bonwell & Eison, 1991). However, for instructors of online and *blended courses* (having some online elements), designing online environments for active learning can be a daunting task. This chapter provides support for instructors of these courses by outlining evidence-supported approaches for engaging students via active online learning.

Bonwell and Eison (1991) defined active learning as students doing things in class and reflecting on their experiences. In passive classrooms, the teacher is the primary actor, imparting information to students, asking and answering questions, and testing students' retrieval of information (Petress, 2008). In the active-learning classroom, students are the primary actors, engaging in meaningful activities and taking ownership of their learning.

Research suggests that passive or traditional didactic teaching (i.e., lecturing) is insufficient to foster ownership and engagement from students (Donovan, Bransford, & Pellegrino, 1999; Johnson, Johnson, & Smith, 1991). Active learning, however, is believed to promote engagement that positively shapes what students learn, how well they learn it, and their attitudes toward learning. The goal of active learning is to move students toward a deeper understanding of materials and the ability to engage in higher-order thinking skills (Bonwell & Eison, 1991), while keeping them motivated (Barkley, 2010). Active learning also positively impacts the classroom environment and community because of its emphasis on student-to-student interaction (Yazedjian & Kolkhorst, 2007).

While active learning can refer to a particular teaching and learning strategy, it is more commonly used as an umbrella term under which more specific strategies fall (Prince, 2004). The active-learning umbrella includes collaborative learning, inquiry-based learning, flipped classes, and a host of other teaching and learning approaches. Several of these active-learning practices will be explained in this chapter. Though active-learning methods differ, they have five core commonalities: (a) students' active participation in learning beyond didactic processes; (b) a focus on the development of skills, not just retention of information; (c) development of higher-order thinking skills; (d) student engagement in activities that promote deeper student learning; and (e) reflection and metacognitive (i.e., thinking and learning about learning) skills (Bonwell & Eison, 1991).

These five core elements of active learning may be easy to spot in a face-to-face class, but how are they fostered online? Due to a perceived lack of social and cultural cues people use to connect to each other, online environments are often seen as impersonal. Despite this, the online environment is well suited to active learning because it is unhindered by the physical constraints that sometime impede active-learning activities in a traditional classroom. Today's students are also much more connected online than in the past, allowing for active learning to take place in many contexts and via many devices. Further, with a little effort, most online environments can shift power from the teacher to the student and provide a setting

in which students are taking the lead in their learning. Hence, online learning environments can be designed to foster active student learning by leveraging the access, interactivity, connection, and user agency these environments provide.

To effectively use active learning online, instructors must carefully plan their strategies and design for the online environment. This chapter will outline research-supported approaches to engaging students online and provide examples from instructors at several educational institutions. These methods will cover (a) learner-content engagement, (b) learner-instructor engagement, (c) learner-learner engagement, and (d) evolving applications for online learning. The first three topics are lenses, first proposed in Moore's (1989) exploration of online interactions, and are not intended to be rigid categorizations but rather useful frameworks through which approaches can be understood. The final section will introduce *flipped classrooms* (i.e., content delivery happens outside the classroom while guided practice and concept engagement happen within the classroom), which are gaining in popularity in higher education today and provide a unique approach to classroom structure using online elements. A resources page listing web addresses of a variety of online tools is provided at the end of this chapter.

Learner-Content Engagement

Active-learning proponents often refer to content delivery in a course as passive, with students receiving content via lecture or textbooks. Even online content is seen as passive, evoking images of learners staring blankly at screens or receiving online content while multitasking with more engaging media. Within that mindset, discussing learner-content engagement might seem anathema.

In active learning, however, the goal is to create an environment where students' interaction with content is dynamic and leads to deeper engagement with course topics. Simulations, interactive content, and games can help make content more engaging for students but can be difficult and time-consuming to produce. In the next sections, strategies for fostering student interaction with content, without requiring heavy time or skill commitments, will be explained.

Driving Content Engagement Through Questions

Inquiry-based learning is a way of engaging students with content by asking them to find and make sense of content, rather than expecting it to be delivered to them. This approach, which can be used in face-to-face and online classes, begins with a broad question, often ill-defined and open-ended, and provides scaffolding

for students' exploration of course content to answer that question (Musawi, Asan, Abdelraheem, & Osmans, 2012). Inquiry has been shown to help students make gains in conceptual understanding and improve process and literacy skills associated with course topics (Brickman, Gormally, Armstrong, & Haller, 2009).

This type of learning works in online learning environments because of the important role web resources and networked connections can play in inquiry. However, inquiry-based learning does require substantial instructor involvement, such as giving feedback to teams, helping students get unstuck when they reach dead-ends, and sprinkling helpful assessments throughout the process to assist teams in monitoring and adjusting their progress (Miller, 2008). These tasks are somewhat harder to do online because of the interpersonal distance that many students and instructors experience. Instructors who plan to use inquiry learning in their online classes should prepare instructor-facilitated feedback and scaffolding activities to support student inquiry teams, such as an activity to teach students how to use library resources in their inquiry process.

The inquiry process begins with a trigger to launch students' exploration of a topic (Garrison, Anderson, & Archer, 2001). Miller (2008) recommended using a video to set up the area for exploration. Other media triggers could include sound clips, archival footage, or primary source documents. Regardless of the format, triggers should elicit multiple questions that spark students' curiosity and prompt them to seek the best sources of evidence to support their hypotheses. Figure 8.1 offers a list of possible inquiry questions across various disciplines.

In online courses, students doing inquiry learning may be expected to join a discussion with their teammates to talk about what they think is happening or will happen. From there, the teams can begin researching and collecting ideas to formulate hypotheses for the problem presented. This part of the inquiry process is known as *exploration*. Here, students can leverage the expansive networks of information and people available on the Internet. At the conclusion of their explorations, teams are expected to present a product, a solution, or a response to the inquiry. While this interaction could happen asynchronously, via a discussion forum or similar tools, synchronous tools may be best for postinquiry discussions, allowing students and instructors to give immediate responses and feedback to the teams.

Example: Inquiry Learning

Stanford University instructor Anne Friedlander took a creative approach to inquiry learning in her Environmental Physiology course. She and a teaching assistant created *Where Is Corey Now?* videos featuring the teaching assistant in a variety of physiologically stressful environments (e.g., cold climate or high altitude)

Social sciences	How would government/social/economic responses have been different if Hurricane Katrina had struck New Orleans before 9/11? How are responses to hurricanes different today (post Katrina)?
Natural sciences	What influences the percentage of our brain that we use? What would happen if all coral disappeared from the oceans? How much would anthropogenic greenhouse gases need to be reduced to reverse the global warming trend?
Humanities	How would society change if everyone suddenly lost the sense of sight? The sense of touch?
Computer sciences and engineering	Where does our school's library store its digital archives? How can the efficiency of wind turbines be improved?

Figure 8.1. Inquiry questions across various disciplines.

and captured data from his body's responses to the conditions. Rather than fully explaining in the video what was happening to Corey's body, Friedlander pointed to the data, noting important changes, enigmas, and concerns that students should consider. Students watched the videos online before class and then, as part of in-class group work, investigated what was happening to Corey's body. Friedlander and her teaching assistants moved around the groups to answer questions, seed ideas, or help find the right resources to investigate. In some face-to-face class sessions, Friedlander reproduced the conditions from Corey's videos and allowed students to experience those conditions themselves. At the end of each session, she led a discussion among the teams about what they found, where they went astray, and takeaways from the inquiry (personal communication, August 14, 2013).

Creating Online Concept Maps

Concept mapping is a method of visually outlining relationships between concepts in a course or subconcepts within a topic (Figure 8.2). When students make these connections between course concepts, they improve their ability to recall and understand those topics (Karpicke & Grimaldi, 2012). Further, concept maps help students engage in synthesis and evaluation of course concepts, potentially deepening their understanding (Angelo & Cross, 1993). These visual displays may also be used in combination with inquiry approaches to help learners organize their findings (Musawi et al., 2012). Students' concept maps give instructors a good sense of the learner's conceptual schemata and can provide opportunities to address misconceptions or missing connections (Angelo & Cross, 1993).

The rise of social web technologies has brought a suite of tools that can be used for individual or group-based concept mapping. Online mind mapping tools, such as MindMeister, allow students to create and share concept maps; some tools (e.g., Prezi Meeting) let multiple students collaboratively and synchronously build concept maps (Figure 8.2). For example, students can begin with a shared presentation space and synchronously add concepts, connect ideas using arrows, and highlight relationships with circles and other visual tools. While the tool sets for online concept mapping are evolving, using tools for engaging students with content remains an effective and easy-to-implement practice.

Simulations and Games

Interactive content can offer fun and engaging opportunities for students to connect with a subject. However, most instructors do not have the time and resources needed to create effective games, simulations, and other forms of interactive content. Rather than focusing on its creation, instructors may look to reuse interactive tools and strategies developed by other faculty or open courseware initiatives, such as MIT's Open Courseware. The University of Colorado at Boulder developed a reputable series of physics simulations, known as PhET, that teach concepts ranging from molarity to plate tectonics. Learning object repositories, such as MERLOT, may also offer simulations and games for a wide range of disciplines.

Learner-Instructor Engagement

Though active-learning models call for greater student participation in the learning process, they do not propose a reduction in faculty engagement. Rather, active learning requires substantial commitment and engagement from both students and instructors (Barkley, 2010). Active learning shifts the role of the instructor to expert facilitator and guide. This approach emphasizes the importance of creating a space for student practice, allowing students the freedom to fail, and provides timely, contextual, rich, and meaningful feedback to enhance learning.

Learner-instructor interaction can be difficult in online courses, particularly large online courses, and online instructors often replace learner-instructor engagement demands (e.g., providing rich feedback, responding to inquiries, being available for student questions) with more learner-content interaction (Anderson, 2003). However, learner-instructor engagement is likely to have the most perceived value to the students in both face-to-face and online environments (Anderson, 2003). For this reason, instructors should look for technologies that help them interact with students in timely, effective, and efficient ways. The next two sections recommend strategies and tools for instructor-learner engagement.

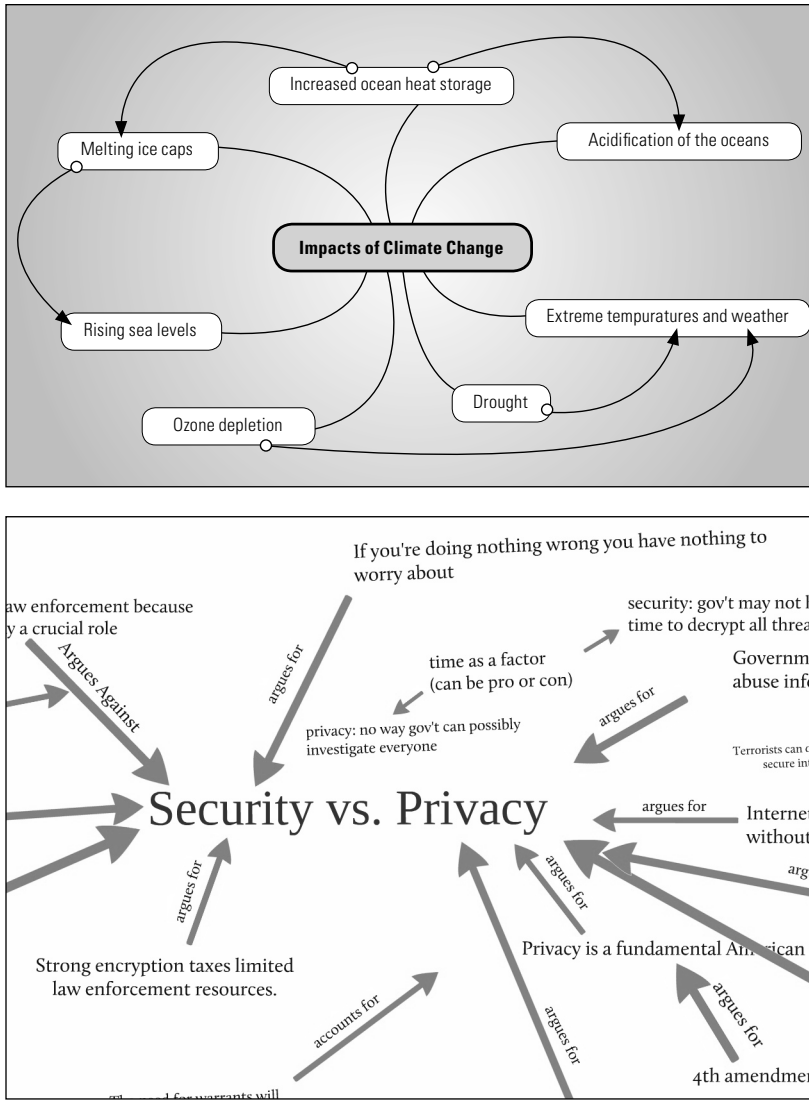

Figure 8.2. Two examples of online concept mapping: Mindmeister and Prezi. Bottom image adapted from "*In-Class Collaborative Debate Mapping With Prezi Meeting*" by D. Bruff, Agile Learning Blog, November 30, 2010. Copyright 2014 by Agile Learning. Reprinted with permission.

Formative Assessment and Feedback

Formative assessment is intended to help students develop their understanding of course topics by providing a mechanism for immediate and useful feedback. *Formative feedback* assists students in making progress in their learning by helping them reflect on and improve their learning processes. Svinicki and McKeachie (2011) noted, to be effective, feedback should be specific, contextualized, forward-looking, timely, and transferable.

Timely formative feedback focuses on students' learning processes, allowing them to make adjustments to what they are doing in a course to improve their outcomes. In online and blended learning, formative feedback can also help convey a sense of immediacy that may be less obvious in an online environment. Fostering immediacy, particularly in a fully online course, can aid in overcoming feelings of distance between instructors and students (Shackelford & Maxwell, 2012; Thweatt & McCroskey, 1996).

Examples of formative feedback are short, embedded online quizzes sprinkled throughout the environment to give students a chance for self-assessment, self-reflection, and instructor feedback. Online learning platforms, such as Canvas or Blackboard, provide functionality for instructors to create low-stakes objective quizzes students can take multiple times and that have built-in feedback to help them learn from mistakes and reflect on correct answers. Paired with immediate feedback, frequent online low-stakes quizzes have been shown to improve students' performance in courses (Johnson & Kiviniemi, 2009).

Formative feedback is also important for students' written or creative work. Grading written assignments and providing extensive feedback is time-consuming, and students often do not use the instructors' comments to improve their work. In addition, feedback on written work may arrive too late for action, and this can impact online students' success in a course. To combat feedback delays, some instructors record audio and/or video feedback on students' work, which can be done for individuals, groups, or the entire class (see example on the Resources page at the end of this chapter). Audio or video feedback may provide more thorough and contextual feedback to students while allowing students to pause and replay the feedback as needed (Pan et al., 2012).

Feedback screencasts are easy to produce using free or low-cost software, such as Jing or Camtasia, and can be distributed to students via e-mail or in students' online dropboxes. This technology allows instructors to provide timely contextual feedback on students' written and creative works.

Similarly, instructors may offer audio and video feedback to small groups or the entire class. These types of feedback can help students feel engaged with the

instructor, whether in a fully online or blended environment, and monitor and adjust their learning processes throughout a course. For example, at the end of each section of an online course, an instructor might create a short video summarizing important points, addressing common misconceptions, or preparing students for upcoming topics. Small groups may benefit from a video of the instructor reviewing their group work and group processes, and perhaps sharing a message of encouragement. These feedback media can be recorded using smartphone-based applications, inexpensive web cameras attached to computers, or consumer-grade video cameras.

Example: Assignment-Based Feedback to Online Students

In the author's online course at Texas Wesleyan University, video was used to provide feedback on assignments. The feedback was not specific to any one student; rather, it broadly addressed how the class performed related to the goals for assignments. These videos dealt with misconceptions, questions, and concerns the students expressed; sometimes the videos provided encouragement or introductions for upcoming modules. The instructor-made videos (IMVs) provided conceptual scaffolding for students (Pan et al., 2012) and were created using a small digital USB camera (i.e., Flip Cam) and a consumer video editing software tool (i.e., iMovie). The IMVs were distributed via YouTube and embedded in the announcements section of the online courses. An example of an IMV is available on the resources page at the end of this chapter.

Synchronous Technologies to Connect Instructors and Students

Synchronous discussion tools may include text-based chat, document and desktop sharing, breakout chat sessions, virtual whiteboards, sketchpads or mind maps, and recording capabilities. Text-based synchronous technologies, such as chat rooms and Twitter, are used by instructors for communicating and sharing resources with students in real time. Synchronous technologies may foster immediacy and presence in online and blended courses, especially when those technologies include live video, as with Google Hangouts or Skype. Instructors can use synchronous communication tools to reduce instructor-student interpersonal distance and provide students with more opportunities for feedback and mentoring.

Virtual classrooms and chats have been part of learning management systems (LMS) for decades, and instructors have used these tools to hold virtual office hours, real-time discussions, live icebreaker activities, and live lectures. On-campus technology experts often provide support for these tools, which exist within a familiar

course environment. The key limitation of LMS-based tools is they are closed to people and networks outside of the university, restricting possible collaborations, wider discussions, and participation by guest speakers. In addition, tools that are outside of the LMS evolve more quickly than those within the system because of the broader consumer base for non-LMS tools. Instructors should investigate the pros and cons of working with LMS and non-LMS tools, such as Google Hangouts, and determine which fit best with their instructional goals.

Google Hangouts have grown in popularity among educators for the toolsets they provide for synchronous discussion, such as team meetings where sharing features allow students to collaborate on documents and presentations. Hangouts enlarge the video feed of the person speaking, making them good online spaces for debates, interviews, and brainstorming activities. Some instructors use the recording capabilities of Hangouts to invite guest speakers to a live interview and stream the recording of the interview on YouTube. Hangouts also include text-based chat so students can take notes or discuss ideas in text while video-based discussions are occurring.

Learner-Learner Engagement

Perhaps the greatest evolutions in teaching, resulting from affordances of social technologies, are in the area of learner-to-learner engagement. Social technologies link learners to a global audience and foster more meaningful interactions among learners within the same class. Meaningful interactions are an essential part of active learning—both online and in face-to-face classes—and they must be carefully cultivated. Research evidence points to the incomparable value of peer-to-peer interactions for learning, if those peer interactions are structured for discussion, questioning, explanation, and feedback (Boyle & Nicol, 2003). Some social technologies may even act as social glue for online or blended learners, helping them to feel as though they belong to a class even though they may not always connect to other learners face-to-face (Dorum, Bartle, & Pennington, 2010).

Social technologies present great opportunities and challenges for peer-to-peer interactions. For example, social media are used by many students for non-academic purposes and, therefore, are familiar and accessible to them. However, these technologies are also sources of distraction, and some students may struggle to understand how they can be used for learning. Instructors should leverage the networked power of learner-to-learner engagement technologies but keep students focused on course goals by clearly stating expectations and outcomes for the use of social technologies. The next sections present specific strategies and tools for learner-learner engagement.

Online Peer Review and Feedback

Peer review (see Chapter 9 for more information on assessment) is an active-learning technique that involves students' analyzing and evaluating other students' work (Odom, Glenn, Sanner, & Cannella, 2009). With peer review, students learn how to provide actionable feedback on work products while developing metacognitive skills that help them evaluate and improve their own work. Peer review is difficult to effectively facilitate in the face-to-face classroom, and perhaps even more so online. However, new online tools for peer review, and a renewed interest in large-scale review, such as in massive open online courses (MOOCS), have provided insights into improving online peer assessment.

Rubrics are an essential ingredient for successful peer review, outlining expectations for student work and assigning numeric or categorical values to describe how well that work meets expectations. For online peer review, rubrics must feature clear statements of expectations so students can make sense of them with less instructor oversight (Kulkarni & Klemmer, 2012). Language on the rubrics should be free of jargon and not assume that students understand technical terminology or the rationale behind the assignment criteria.

Though students may be able to accurately evaluate each other's work using rubrics, many struggle to provide actionable feedback other learners can use. To help, instructors can scaffold feedback in the online environment by providing prompts that can spark useful feedback exchanges among students. Klemmer and Kulkarni (2012) called these prompts *fortune cookie feedback* (Figure 8.3), which are snippets of feedback based on common errors and possible ameliorative actions for a given assignment. These snippets are provided to students while they are reviewing others' work to seed appropriate qualitative feedback. An example of fortune cookie feedback in a history class may be, "Cite primary sources, instead of secondary sources, to add credibility to your arguments." A student can copy the fortune cookie feedback into a text box and supplement it with additional feedback text. This approach has been shown to improve the quantity and quality of feedback learners provide to each other (Klemmer & Kulkarni, 2012).

Discussion forums are perhaps the simplest tools for peer review, allowing students to post their work to a discussion thread and letting others provide feedback in subsequent threaded responses. Some discussion forums can have restricted membership so that only students in an assigned group can see and review each other's work. Online document services, like Dropbox, Box, or Google Docs, can also be used for peer assessment. Students can upload their work to shared folders with each of those services and provide in-document feedback to other students.

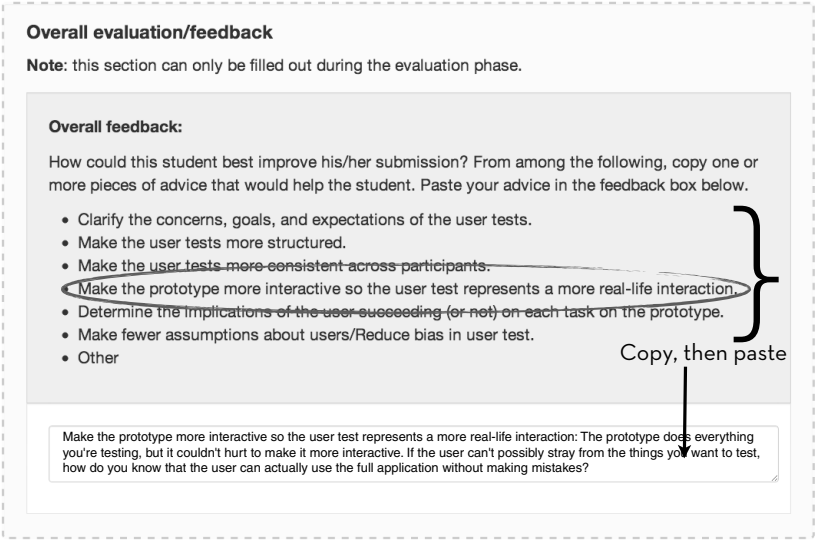

Figure 8.3. Fortune cookie feedback. Adapted from "Peer and Self Assessment in Massive Online Courses," by C. Kulkarni et al., 2013, *ACM Transactions on Human-Computer Interaction, 20*(6), p.18. Copyright 2013 by ACM. Reprinted with permission.

Newer online learning platforms, such as Coursera and OpenEdX, have built-in peer review systems for courses. These systems are sophisticated, facilitating calibrated peer review, but may be more difficult for students to use.

Example: Online Peer Review

Scott Klemmer, a professor at the University of California-San Diego, taught a public online course on Human-Computer Interaction using calibrated peer review to assess students' work (Kulkarni & Klemmer, 2012). Calibrated peer review requires students to assess prewritten and graded texts, using the rubric for the assignment, before they can review other students' work (Kulkarni & Klemmer, 2012). If a student's review of the prewritten text meets standards, he or she can begin reviewing other students' work. In Klemmer's class, students submitted design assignments to the platform's peer assessment system and began the calibrated review process. Students who successfully passed the calibration process then reviewed the work of five other students. In addition to providing a numeric grade, students were encouraged to give each other qualitative feedback, starting with the fortune cookie prompts (Figure 8.3; Klemmer & Kulkarni, 2012). To help students improve the quality of their work, they were shown examples from

papers that were scored slightly higher than their own. Klemmer and Kulkarni (2012) found that students who were shown somewhat better papers as examples improved their performance compared to students who were shown the highest scoring papers as examples.

Shared Curation and Discussion of Course Content

Online curation is the organizing, tagging, and sharing of web content with a network of online users. Technologies for online social curation, such as Pinterest and Tumblr, have made their way into classrooms and universities. Students may use these tools and websites to collect and display resources for a course. Many of these technologies also allow students to build discussions around curated content, providing embedded conversations for students to make sense of the content.

These visual curation tools may be particularly useful in disciplines in which imagery and media are important parts of course content. For example, Pinterest displays content with large images to an individual or shared themed gallery, called a *pin board*. In a class on Asian and Indonesian cultures, students might post links and images to a shared pin board labeled Javanese Clothing. Students can comment on and reshare pins on the board. For instance, at Keene State College in New Hampshire, students in a Design for Performing Arts course shared images of design ideas with explanatory text in the comments for each pin (Educause Learning Initiative, 2007).

Another social curation site, Storify, allows students to collect and display various media to form a sequenced narrative. For example, students in a class on Democratic Development might aggregate media, including images, videos, and Tweets, into a shared narrative about events in emerging democracies or in nondemocratic nations.

Where social curation tools like Pinterest and Storify use text-based discussion around curated content, Voicethread and Flipgrid facilitate audio and video discussion around this content. Both services allow instructors and students to upload media and then record audio or video responses to those media. Pacansky-Brock (2009) shared an example of a Voicethread assignment in which students were required to create a gallery of photos taken by a local photographer and layer those photos with an audio interview with the photographer. Once the galleries were shared with the class, other students could add audio and video comments to them. Pacansky-Brock noted that, in classes where she used Voicethread, 81% of her students said that interacting with other students on Voicethread increased their sense of community in the class.

Online Social Connections

Social networking technologies are increasingly pervasive among college-aged learners. A 2012 report by the Pew Research Center found that 67% of Internet users access social networking sites, with this number rising to 83% for users between the ages of 18 and 29 (Duggan & Brenner, 2012). Because of their widespread use, social networking technologies may afford the greatest opportunities for community building among learners in a course; however, for effective learning, these technologies may also require the greatest *communal scaffolding*—the process of helping online students bridge interpersonal distance (Woods & Ebersole, 2002). This scaffolding involves setting clear expectations for how learners should interact (*netiquette*), allowing learners to write and discuss guidelines for interacting on those sites, and modeling or mentoring from the instructor.

Social technologies provide students with access to a large, diverse, and information-rich distributed network of people. In a digital storytelling class (ds106) at the University of Mary Washington, students connect to each other and to a broad network of people online through the course's blog, web-based radio station (ds106 Radio), and crowd-sourced assignments database (DS106, n.d.). Learners can also network with each other and peers outside the classroom via collaborative-editing websites, like wikis or Google Sites, and via community sites, like Google Plus and Facebook. Each social networking site offers opportunities for learners to connect, but the choice of which sites to use should be made carefully. Instructors must consider how much control and access they want to give learners in online social environments and help students learn about protecting their privacy, appropriate and inappropriate sharing of personal information, and acquiring other social media literacy skills.

Some instructors use Twitter to help students connect to other learners inside and outside of the classroom. Twitter streams provide more immediate interaction opportunities for students than discussion forums and can link students to experts, practitioners, and other learners in their fields. Instructors may encourage students to follow experts or practitioners via Twitter and share those professional insights with other classmates. For example, a geology instructor may encourage students to follow the Curiosity rover as it tweets from the surface of Mars. In addition, an instructor may use Twitter as a discussion forum, asking students to respond to questions and interact with other students' responses in real time. Twitter might also be used to help online students develop a sense of belonging by sharing small bits of information about their personal or academic lives.

Evolving Applications for Active Online Learning

This chapter has outlined tools and approaches for engaging students in online active learning. As online technologies evolve, instructors may find new approaches to engage their students or help them connect more deeply with course content and/or other students. One such emerging model, the *flipped classroom*, is described in detail in this section.

Flipped Classes: Taking Content Outside the Classroom

In a traditional lecture-based course, class time is used for content transmission and understanding activities, such as lecture, while time outside of class is used for application and synthesis activities (e.g., homework and group work). The flipped class aims to invert the traditional model by moving content transmission activities outside of class time and moving higher-order cognitive tasks into the classroom. This model of blended learning is designed to make the most out of in-class interactions, when students and instructors are in the same room and can provide real-time feedback and support to each other.

The flipped class model has grown in popularity since its inception in the late 1990s, as an outgrowth of Mazur's (1997) peer instruction model, which emphasized peer-to-peer learning interwoven with direct instruction to help students better understand and retain course concepts. In 2000, Lage, Platt, and Treglia introduced the term *inverted class* to refer to their approach to fostering more student engagement; later that year, Baker (2000) coined *flipped class*, which is now widely used in education circles. The flipped class model is enjoying a surge in interest because of growing global interest in blended and online learning.

Another reason for growing interest in the flipped model is the availability of easy-to-use consumer-grade video capture and editing software for recording content. With screencasting software, like Camtasia, instructors can very quickly assemble short videos for students to watch before class. The length of video varies greatly between topics and between instructors; however, creating shorter and more focused videos (between 7-20 minutes) may help with student attention and with easier editing of video content. To check students' conceptual understanding and/or provide feedback, some host platforms allow quizzes to be embedded within a video or offer tools for self-evaluation immediately after a video.

One difficulty in implementing a flipped class involves planning what to do with in-class time. Instructors have used in-class time for team-based learning and peer learning activities, such as workshopping each other's papers (e.g., editing, giving feedback, discussing argumentation) or working in groups to solve problems.

Using results from quizzes embedded in videos, or through in-class discussions, instructors may find that students need deeper dives into difficult concepts or, perhaps, to backtrack to core concepts they have misunderstood. Instructors may even use class time to get out of the classroom, offering field trips, experiential- and service-learning, community- or industry-based projects, and labs.

Example: Flipping a Humanities Class

In 2011, Richard Newton, a professor at Cal Poly Pomona, began flipping his class on Ethnicity, Gender, and Religion to foster deeper and more active learning among his students (Barnett, 2013). Before flipping his class, his students struggled to delve deeply into topics because they had not developed skills for analysis and argumentation. Newton began recording short screencasts on those topics to help students better prepare for class. He used screencasting software, such as Doceri or Educreations, on his tablet device to record these screencasts and distributed them to students before class via YouTube (see example on resources page). When his students arrived prepared, Newton used class time for more in-depth activities. In one class, for example, he posed the question: Does hip hop promote or hinder efforts toward gender equality? Students worked in groups to write thesis statements in response to the question and then spent the remainder of the class time arguing for or against other groups' statements (Barnett, 2013).

Conclusion

Instructors may find support for learning about and adopting new active online learning techniques at their universities' centers for teaching and learning or academic technology offices. Or, they may discover new strategies by connecting with online communities of practice via blogs, Twitter, and open online courses designed for educators. Online publications by EdSurge and the Educause Learning Initiative can also guide instructors' use of emerging technologies for active online learning.

Online environments can be spaces for active student learning. With careful planning and design of online environments, instructors can help create conditions where students can make the most of their learning, seize ownership of their process, and embark on a journey of continuos lifelong learning.

Resources

Concept Mapping Tools

Mindmeister: http://www.mindmeister.com/
Bubbl.us: https://bubbl.us/
Prezi Meeting: http://prezi.com/collaborate/

Open Courseware

MIT OpenCourseware: http://ocw.mit.edu/
PhET: http://phet.colorado.edu/
MERLOT: http://www.merlot.org/

Online Platforms

Blackboard: http://www.blackboard.com/
Canvas.net: https://www.canvas.net/
Coursera: https://www.coursera.org/
EdX: http://mooc.org

Online Resource Publications

EdSurge: https://www.edsurge.com/
Educause Learning Initiative: http://www.educause.edu/eli

Screencasting

Jing: http://www.techsmith.com/jing.html
Camtasia: http://www.techsmith.com/camtasia.html
iMovie: http://www.apple.com/ilife/imovie/
Example: IMV: http://www.youtube.com/watch?v=E-H1eGjFSPU (Used with author's permission)
Doceri: http:// http://doceri.com/
Educreations: http://www.educreations.com/

Synchronous Communication

Google Hangouts: http://www.google.com/+/learnmore/hangouts/
Twitter: https://twitter.com/
Skype: http://skype.com

Social Tools

Pinterest: http://pinterest.com/
Facebook: http://facebook.com
Tumblr: https://www.tumblr.com/
Storify: http://storify.com/
Voicethread: http://voicethread.com/
Flipgrid: http://flipgrid.com/info/
Google Sites: http://sites.google.com

Document Storage, Sharing, and Collaboration Tools

Dropbox: http://dropbox.com
Box: http://box.com
Google Docs: http://docs.google.com/

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