ADDING SOME TEC-VARIETY

100+ Activities for Motivating and Retaining Learners Online

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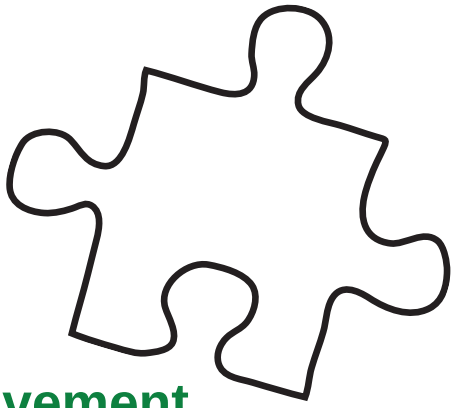
CHAPTER ELEVEN

PRINCIPLE #8 ENGAGEMENT



(Includes Effort, Involvement, and Investment)

To begin, begin.

—William Wordsworth

Can there be a more pressing issue today in education, and perhaps society, than learner engagement? Walk down the conference hallways of any educational technology conference and then pop into any keynote address, invited talk, or expert panel session. No matter the room you enter, the drumbeat will be the same: you will undoubtedly hear a call for better understanding of how technology can engage students in the learning process (Stansbury, 2012).

That discussion will have you reflecting on the underlying theme of this book on online motivation and retention. As you have learned from the previous 10 chapters, motivated learners are the ones who are deeply engaged in the learning process. They are committed to learning and push hard to complete assignments at the highest possible level of quality. Decades of research on student engagement indicates that students who make an investment of extra effort in the learning process will see positive results (Kuh, 2009a). Simply put, when it comes to student achievement, involvement in the learning process matters.

The real inconvenient truth of our times, however, is the lack of learner engagement and all-too-often implicit contract of disengagement between overworked faculty members

and students juggling multiple responsibilities (Kuh, 2003). As a result, students are not only failing to engage in their courses, but are dropping out of schools and universities altogether. Those who hang on often become savvy at meeting minimum course requirements, instead of attempting to connect ideas or read widely and deeply. As we know, when online courses are filled with authentic and meaningful tasks, as discussed in Chapter Nine, or when these courses embed thoughtful collaboration, as laid out in Chapter Ten, learner understanding of the content is deeper and more sustainable (Herrington, Oliver, & Reeves, 2003; Herrington et al., 2010).

But just what is engagement? According to Johnmarshall Reeve (1996), engagement comprises the intensity and the emotional quality of a learner's involvement in a school-related task or activity. Engagement is manifested in sustained behavioral involvement and overall positive affect or emotion in a task.

Disengaged learners, however, lack commitment to the learning situation or to school in general and often see no value in learning. As a result, they often withdraw or rebel. At the very least, they are bored. At the extreme, their career aspirations are lowered, they skip classes, and they have a negative attitude toward the class or learning as a whole. There is no learning involvement or investment. There is no commitment. And no tenacity or perseverance either. Simply put, there is no effort, no grit. As a result, their excitement or passion for learning is nonexistent.

All is not lost, however. As we highlighted in the discussion of Carl Rogers in Chapter Four, an environment filled with warmth, respect, choice, enthusiasm, and sincere praise can promote learner engagement and motivation (Reeve, 1996). Also helpful, according to Reeve, is modeling, guidance, and clear learning goals. Learners need to be involved and to have adequate support structures to find success. They need to belong to something or feel socially interconnected (Usher & Kober, 2012). At the same time, they need to sense that they are empowered to make some of their own learning choices. We addressed ways to build warmth, enthusiasm, and choice in Chapters Four and Eight of this book.

To understand engagement, such warmth and positive tone is not enough, however. Ingram (2005) suggested that engagement is made up of three variables: (1) deep attention to the learning task or situation; (2) the activation of effective cognitive processes (e.g., strategies of rehearsal, organization, visual imagery, monitoring comprehension, and so on); and (3) the social context or community in which learning occurs. According to Ingram, one cannot simply look at computer login data or the number of contributions a particular student posts to a discussion forum and make a determination about the level of engagement. The concept of engagement is far more complex than that.

As data from the National Survey of Student Engagement (NSSE) reveal, part of that complexity results from the degree to which online learner engagement can significantly differ across courses, programs, and departments (Young & Bruce, 2011). Many instructors and programs struggle with determining the types of tasks and activities suitable for engagement. The NSSE focuses on institutional characteristics or components of engagement as well as the time and energy that learners invest in educationally purposeful activities (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). Engagement is seen through the lens of the number of writing assignments, books read, and presentations made as well as obtaining prompt feedback, discussing ideas outside of class, interacting with faculty

members and peers, and tutoring or mentoring other students. It is also shown through coursework emphasizing the analysis, synthesis, evaluation, or application of what the student has learned (Kuh, 2009b).

Tens of thousands of students from hundreds of colleges and universities across North America take the NSSE each year (National Survey of Student Engagement, 2006). From 2000 to 2011, more than 4 million students from 1,500 institutions in North America and several in Europe and the Middle East completed it. As George Kuh and his colleagues at Indiana University (IU) have found across these studies, the more students take responsibility for their learning, the more they become invested and committed in the activity.

Not surprisingly, the NSSE has expanded over the years to look at student engagement in distance learning. Interestingly, Chen, Gonyea, and Kuh (2008) found that students taking all of their courses online were more engaged than those on campus. Online learners were not only more challenged and engaged in higher levels of reflective thinking, but also indicated that they gained more practical knowledge and were generally more satisfied with their course experiences (Kuh, 2009b). There was more interaction between online learners and faculty members, especially among first-year distance learners. As a direct consequence, older or more experienced distance learners surprisingly perceived their learning environment as more supportive than did residential students sitting in traditional courses.

Technologies for Principle #8: Engagement

Year after year, we hear the steady mantra that schools, universities, or corporate training centers should purchase a particular technology tool because it will better engage their learners. Unfortunately, the technological resources that learners need keep changing. Today instructors engage students with online surveys and polls that can be completed on mobile devices. They also may rely on chat tools in a synchronous Webinar to engage the learner. Or they could connect an online news event to the current topic of discussion. That discussion might expand into a global or cross-cultural space as a means to pique learner interest and show the relevancy of the topic. At some point, this discussion might break out into small teams that complete a collaborative group task in a wiki or online document.

As inroads into the gamification of learning are made, it is increasingly obvious that learner engagement can also come in the form of educational games, whether they be solitary in nature or collaboratively pursued. For the very competitive or sports-minded, a soccer net could be set up to kick answers through. At the same time, a bell could sound, a light could flash, or a winning record can be displayed as a student completes an activity. Each game level completed can award the learner with a new status, points, or some other form of recognition. As accomplishments mount, learners will crave more of that sensation of winning or success.

Another place where learner engagement is apparent is in the use of Twitter, Facebook, and other social media. Educational activities in Twitter might include extended class discussions, sending task or campus event reminders, providing academic support information, organizing study groups, stimulating book reviews, and generally helping students connect. Research by Junco, Heibergert, and Loken (2010) indicates that such activities can foster student engagement and feeling of connectedness. Additional research with social media is now needed.

Still other forms of engagement can occur through voice instead of text or images such as in the use of VoiceThread or Vocaroo, or video and voice feedback with Flipgrid. In addition, natural language personal assistants such as Siri for the iPhone allow the user to ask questions and obtain personalized information such as stock or weather reports, recommendations for restaurants, directions to campus, and today's scheduled appointments (Pogue, 2011). Such immediate and personalized forms of feedback in the form of a voice, whether it be computer-generated or a real human, can arouse a sense of excitement and energy in the learner.

Suffice it to say, there is no particular "engagement" technology and no engagement guarantee. As should be clear from the previous chapter on interactivity, technologies can excite and involve the learner in many ways online. We have known students to work long hours when they are designing a technology product of some type. And we have heard stories of school administrators troubled by having to keep the doors to the school or university buildings open on the weekends or late at night. Clearly, students expend more energy when they realize that their products will be on display for others to view, comment on, share, and perhaps remix (Brown & Adler, 2008). Nevertheless, it is not the technology itself that determines learner engagement, but, rather, specifically *how* that technology is used.

Although many chapters of this book contain opportunities for learner engagement and involvement in the learning process, this particular chapter narrows the focus primarily to learner-content forms of engagement. Such technologies include elements that the learner can interact with such as an animation sequence, a novel timeline, a class multimedia glossary, or an interactive map. Learners may make decisions about artifacts found in a timeline. When they move up or down the timeline, additional data, interactive images, or other embedded media elements can appear. In some online timelines and databases, learner decisions and selections are immediately represented visually.

As Web technology advances and training opportunities increase, the forms and types of interactive content will no doubt skyrocket. Learners will not only find preselected content and objects to interact with, but will encounter greater opportunities to design the content that the class will explore and use. As this transpires, digital books and mobile technology will continue to evolve to offer new ways to engage with content. For instance, simulations and animations could depict famous scientific experiments, war battles, political decisions, geographic expeditions, or sporting events that can be accessed on demand while reading various sections of the book. At the same time, those learning languages are finding ready access to audio and video files as well as practice exams. Many such activities are detailed in this chapter.

Ten Online Activities in Principle #8: Engagement

In many ways, the 10 activities detailed in this chapter bring online course content to life. These activities go far beyond the mere reception of knowledge; instead, there is an element of learners doing something with the content. Such hands-on tasks might augment or expand online content as well as transform it. Many of the ideas here help learners interact with content in ways that inflame internal passions to play with ideas, make predictions about them, and generally want to know more. A timeline tool representing the United States in the 1950s may inspire someone to learn more about communism, mass transit, or civil rights. A timeline for Korea or Vietnam in the 1950s might also highlight communism, while raising issues of colonialism and the Cold War, just for starters.

As with the previous seven chapters, there are just 10 activities in this chapter on engagement. You might find some of the ideas listed here quite commonsensical or related to a discipline other than your own. If so, reflect for a minute or two on other ways to spur engagement. Perhaps you will add a global component to one or more of the activities listed here. Or you may find ways for your learners to develop and review the interactivity within different online learning content elements. Whatever you do, keep thinking. This is a topic ripe for further experimentation and development.

Activity 71. Interactive Maps and Databases

Description and Purpose of Activity. The Web is offering increasingly rich visual displays of data. Among the more educationally powerful and engaging visuals are maps. There are weather maps, climate change maps, political election maps, and maps showing college applications as well as graduation rates by states and counties over time. Josh Keller from the *Chronicle of Higher Education* has published a number of such maps with his articles on higher education including one concerning adults with college degrees in the United States. But this is hardly a static map. Instead, users can explore an interactive timeline of the changes in college completion rates from 1940 to the present for each county and state. The same dataset can be explored by gender, race, income, and size of population. Juxtaposing such information is quite illuminating (see Web resources associated with this chapter for links to maps).

In addition to college-related maps, the United States Department of Agriculture (USDA) has an innovative Plant Hardiness Zone Map that depicts the types of plants that can survive in different zip codes. Such data is helpful for gardeners and crop growers as well as stock exchange traders. Perhaps more important, this interactive GIS-based map shows the serious effects of global warming (Lloyd, 2012). In addition to gathering knowledge about meteorology and climate change, students can also learn about geography. For instance, they can observe how the location of crops near the coasts or in higher elevations can have a significant impact on growing seasons. Educators in agriculture, geography, meteorology, public policy, and environmental affairs courses could incorporate such maps in their courses.

Skills and Objectives. Includes interactivity, excitement for learning, visual discrimination skills, data analysis, evaluation, comparison and contrast, visual thinking, inquiry, self-directed learning and resource exploration, and application of what was learned. Learners must grapple with complex datasets as well as grasp different ways of representing knowledge.

Advice and Ideas. Read widely. Take note when your newspaper or some online resource includes an interactive map or visual display. Explore the associated website and save pertinent information related to the article. Reflect on how you might incorporate such maps into your courses; perhaps you will simply use them as supplemental resources. Alternatively, you could assign a series of activities or calculations that require data interpretation or calculation skills. Students could form small groups to explore different aspects of the data embedded in a particular online map.

As an example, for the pollution database in the World Mapper, some students may explore greenhouse gases by country, whereas other groups could be assigned to nuclear waste, hazardous waste, carbon emissions, sulfur dioxides, and so on. Each group may find a different hot spot or zone in the world with significant pollution problems.

Variations and Extensions. Instead of exploring a particular map, have students compare and contrast two different maps (e.g., US state or presidential election maps from Fox News, CNN, and the Huffington Post). They could form teams and make predictions about a particular race or margin of victory. Often such maps allow the user to change the color of a state to indicate their opinions about which candidate or party will win a particular state or region. Student predictions would then be compared to the final results. Teams with the best predictions could be granted bonus points or some type of course recognition. In contrast, with different weather maps and norms for particular cities as well as scientific trend maps for the next few months or coming seasons, students could make predictions about cities that will experience different forms of weather during the coming months (e.g., drought, blizzards, rain, and so on) and the implications of these on infrastructure planning and development.

Key Instructional Considerations

Risk index: Low
Time index: Medium
Cost index: Low
Learner-centered index: Medium
Duration of the learning activity: 1–2 weeks

Activity 72. Interactive Multimedia Glossaries

Description and Purpose of Activity. Too often students are limited to the text resources that are provided by publishers and the instructor. Traditional books are mostly static documents allowing for only one type of learning modality. As indicated in prior chapters, psychologists have long realized that people learn more effectively when ideas are represented both visually and verbally (Paivio, 1986) or when multimedia is properly employed (Mayer, 2001).

One particularly engaging and interactive activity we have seen emerge recently is the use of a multimedia course glossary. For example, an online glossary for the course on "Essential Genetics: A Genomics Perspective" includes an interactive term list (e.g., candidate gene, mutant, ribonucleic acid, and the like) as well as practice quizzes, links to Web resources with further descriptions, flash cards, and additional research and reference materials. Some of these resources include pictures, video, and sound. Another such resource, "The Glossary of Computer and Internet Terms for Older Adults" from the National Institute on Aging, is a simple alphabetic listing of 37 key terms with associated definitions, many of which include a visual image or picture.

Requiring your students to browse through such multimedia glossaries can help them grasp key terms as well as feel more comfortable in knowing that they have a supplemental and handy resource base. Instructors could use these at the start of a class lecture or unit to provide a conceptual anchor and retrieval cues for later learning.

Skills and Objectives. Includes term recognition and recall, content review, dual coding of content (e.g., visually and verbally), comparison and contrast of terms, inquiry, self-directed learning and resource exploration, and the application of what was learned. Harkening back to Chapter Four, students find psychological comfort and safety in knowing that the content is available for review at any time.

Advice and Ideas. Multimedia glossaries are a treasure trove of course activities. Spend a few minutes searching in your area to see whether any such resources exist. If you find one of high quality, you may tell your students that a certain percentage of exam items will come from the glossary or that you will have a weekly quiz or crossword puzzle based on it. In addition, students could write reflection papers that reference examples from the multimedia glossary. An alternative writing assignment is to critique the glossaries or write a design document on how they might be extended. Once completed, students could also extend them further in a wiki. They could also use such interactive resources to augment class presentations and discussions.

Variations and Extensions. Ask one or more students to volunteer to create an interactive glossary with links to videos, documents, and animations that illustrate key terms. Once completed, that interactive glossary can be refined and expanded each time that the course is taught. Your overriding goal may be to create the world's best interactive glossary on that particular topic. You could hold competitions between classes within the same institution or across the world for the best interactive glossary. If a single student generates such a glossary, that student might be allowed to drop any other assignment.

In Bonk's class on learning theories, he included a link in his syllabus to a theory-into-practice database that had a comprehensive glossary. Although all the terms had embedded hyperlinks with rapid access to other terms or prominent people, it was unfortunately a text-only glossary. One of his students, Umida Khikmatillaeva, decided to create an interactive course glossary that contained many multimedia components. Not only were terms defined, but there were links to videos for dozens of these key concepts as well as videos of most of the main theorists and researchers mentioned in the course. She also included speeches related to education, motivation, and learning from prominent people such as Bruce Lee, J. K. Rowling, Steve Jobs, Arnold Schwarzenegger, and Tony Robbins. Not yet done, she included sections on course-relevant news, conferences, and Web resources. And with news from places like the New York Times, CNET,

Engadget, and so on, the list continually updates. Not surprisingly, this tremendously engaging glossary is still used in the course.

Key Instructional Considerations

Risk index: Medium
Time index: Medium
Cost index: Low to High (depending on resources used)
Learner-centered index: High
Duration of the learning activity: As needed

Activity 73. Talking Dictionaries and Language Translation

Description and Purpose of Activity. Imagine the possibilities of young or older students understanding the cultures and people of those in distant lands by hearing native speakers' voices respond to their queries. If you teach world history, linguistics, geography, foreign languages, multicultural education, or some other related topic, talking dictionaries can play a role in your instruction.

Such supplemental resources for exploring languages and cultures have exploded during the past decade. Many rare languages and extinct cultures can come to life with online glossaries, podcast shows, practice exams, real-time conversations with language partners, and other resource materials. As an example of this trend, National Geographic, Living Tongues Institute for Enduring Languages, and Swarthmore College teamed up to help preserve several unique languages as part of the Enduring Voices Project (Hotz, 2012). Among these languages is Celtic as well as the Ho language spoken by over one million people in Eastern India. A couple of other languages targeted by this project are Tuvan, which is a Turkic language used in the Republic of Tuva in south-central Siberia, and Siletz, spoken by the Native American Siletz tribes once local to northern California, Oregon, and southwest Washington.

Extensively researched, there are more than 32,000 words in these "talking dictionaries" and over 24,000 audio recordings of native speakers pronouncing different words and sentences in eight endangered languages (Giardinelli, 2012; The Canadian Press, 2012). In some cases, the talking dictionaries contain photos of different cultural objects and artifacts to assist in learning. In these sites, learners can listen to how different words are pronounced and see how they are written. The use of talking dictionaries fosters an appreciation for the diverse cultures of the world, especially those that are gradually becoming extinct.

The Enduring Voices Project is just one example of many through which languages are not only being preserved but extended. With speech-to-text translation dictionaries, mobile applications that translate written signs or conversations into different languages, and online podcast shows of hundreds of different languages, the opportunity to listen to a language is increasingly possible. Of course, in some languages, the oral traditions may be the only form of communication.

The Word Lens tool is a prime example of this fast-emerging technology for language learning and translation. It translates printed words instantly through a video camera.

As a dictionary, the Word Lens will look up words for you and then show how they are used in a context. Such devices are evolving. Search engines like Bing now come with language translation options as do user postings in Facebook. Of course, most Web users have likely used or seen Google Translate at some point.

Skills and Objectives. Includes listening skills, language fluency, the appreciation of diverse cultures, information access, learning through multimedia, self-directed learning and resource exploration, and practice and review of content. Learners can revisit these sites and practice their skills repeatedly whenever needed.

Advice and Ideas. Languages are becoming endangered or abandoned completely at an alarming rate. According to the mission statement of the Living Tongues Institute for Endangered Languages (2013), "Every two weeks the last fluent speaker of a language passes on and with him/her goes literally hundreds of generations of traditional knowledge encoded in these ancestral tongues." Embedded in these languages is an immense store of knowledge about foods, plants, animals, sustainable living, and cultural traditions (Moskowitz, 2012). Educators are among those with a keen responsibility to help value and preserve the rich human cultural diversity of minority communities.

Have your students suggest a sentence that they want translated and listen to the results as a class. Such random searching through the database can excite and better involve students in the learning process. Or you could assign your students to learn a set number of words that they must use in their writing or be able to speak in front of the class. If you want to build on that, assign your students to teams that each write a document or rehearse a speech of that culture. Another idea would be for students to research a particular endangered language and use the talking dictionary as a multimedia component for their research papers or projects.

Variations and Extensions. Consider assigning students to create a product based on their learning from a talking dictionary site. For instance, they could create a short story, poem, or podcast. With younger learners, the product might be a storybook or some other basic literacy materials. Students can also compose test questions for their peers based on their learning. Alternatively, they could write a paper about a culture or people who utilized that particular language; as part of those efforts, they might interview one or more people who still use that language.

Key Instructional Considerations

Risk index: Medium
Time index: Medium
Cost index: Low
Learner-centered index: High
Duration of the learning activity: Every week or as needed

Activity 74. Interactive Timelines

Description and Purpose of Activity. We have found interactive timelines to be among the more powerful learning aids ever developed. Learners have a guided context in which they can explore and learn. They can scroll up and down along the timeline for key historical events, unique information, and something that is familiar or intriguing

to them. Increasingly, the developers of such timeline tools are embedding multimedia components. With such technology, learners can often find a video or audio clip that captures the actual event that they are reading about. As they do, they can see and hear history unfold as it really happened. When a particular interest is satisfied, they can scroll up or down to the next piece of information.

Timelines exist for all sorts of events, people, disciplines, and topic areas. Those wanting to stretch far back in time can explore the "Prehistoric Timeline" from National Geographic (see Web resources associated with this chapter). If recent technological changes are of interest, timelines that appeared in the press when Steve Jobs passed away as well as when Bill Gates retired (Mintz, 2008) are highly engaging (again see Web resources section). A simple scroll through the inventions in the Steve Jobs timeline heightens awareness of the fast pace of technological change as the user observes the personal computer in the 1970s, the Macintosh in the 1980s, the Newton in the 1990s, and the iPod, iPhone, and iPad in the 2000s. Such a journey is also a dynamic history lesson.

Educators wanting to stretch such a technology timeline further back in time are in luck. *The New York Times* published an interactive technology timeline in September 2010. This overview of "learning machines" started with horn-books or wooden paddles with lessons written on them in the 1600s, chalkboards in the 1890s, the radio in 1925, overhead projectors in 1930, educational television in 1958, Scantron-scored exams in 1972, hand-held graphing calculators in 1985, and the iPad in 2010. Those hoping to peer ahead can check out the timeline of the future of computing from *The New York Times* as well as estimate the year in which each of the inventions predicted might actually appear.

Such timelines of technology can be used to supplement course materials or lectures as a means to illustrate key points or foster learner engagement. When the event has paralleled students' own lives, it will be even more empowering. There are also timelines for US presidents where interactive content pops up as you click on a particular person or year. Similarly, the National Constitution Center in Philadelphia has a "Constitutional Timeline" encapsulating over 200 years of stories in the United States with key dates, events, issues, and people that shaped the nation as well as the Constitution. Journeys along the timeline are supplemented by images, audio clips, pop-up text, and other interactive content. Without a doubt, such interactive timeline tools are a sign of Web-based engagement possibilities to come.

Skills and Objectives. Includes interactivity, intrigue, system feedback, visual discrimination skills, data analysis, comparison and contrast, visual thinking, inquiry, self-directed learning and resource exploration, and application of what was learned. Timelines give learners a sense of wholeness or macro lens for a particular field or topic within a field.

Advice and Ideas. Spend an hour or two in a focused search on different key topics, people, concepts, or events related to your class. Search, share, and save timelines that are related to your field. If nothing appears, you might explore the website Timeline Help which has a wide array of timelines that you and your students can access for different countries (e.g., Ancient Greece, Africa, Ireland, and so on), subjects (e.g., Airplanes, Atomic Theory, Telescopes, and so on), events (e.g., the Cuban Missile Crisis, the Great Depression, and so on), people (e.g., Albert Einstein, Oprah Winfrey, Mark Twain, Eleanor Roosevelt, and so on), and technology inventions.

Alternatively, ask your students to find a timeline that relates to their papers or projects. For instance, if they are studying Martin Luther King Jr., there is an online timeline of his life from *USA Today* which was embedded in an online article the day that the MLK National Memorial was unveiled. In addition, you could ask them to make use of one or more timelines in any oral presentation assignments.

Timelines or portions of them may reappear on course quizzes and examinations, with questions related to identifying events, people, and places. Such exams could also ask students to compare and contrast the timelines of two or more people, inventions, wars, religions, or political systems. To push them deeper in a topic, person, or event, you may also ask them to identify key elements or pieces of information missing from a particular timeline. Be sure to evaluate their effectiveness with students and share the results of such activities with colleagues.

Variations and Extensions. Consider having learners create a timeline, either individually or as a group, of a particular topic, unit, product, person, time period, event, and so forth. To accomplish this, they could use a tool like Capzles, Dipity, xTimeline, Simile (MIT), or the Timeline Tool 2.0 from the University of British Columbia. Peer review of timelines created could be incorporated to enhance the quality. When done, consider presenting those timelines in a synchronous or F2F class session. A gallery of timelines created each semester that the course is taught would be a means to showcase student work as well as expand the potential audience for it.

Key Instructional Considerations

Risk index: Medium
Time index: Medium
Cost index: Low
Learner-centered index: High
Duration of the learning activity: Every week or as needed

Activity 75. Exploring Animations, Simulations, and Pop-Up Media

Description and Purpose of Activity. Much experimentation in the forms and types of interactive content has taken place since the emergence of Web-based learning. Many graphs, pictures, and diagrams now contain additional content that can be accessed by clicking on it. Such pop-up media is common in digital books and interactive timelines. In opinion polls about politicians, for instance, pop-up media often indicate how males and females voted as well as how people from different educational levels or income levels feel about an issue.

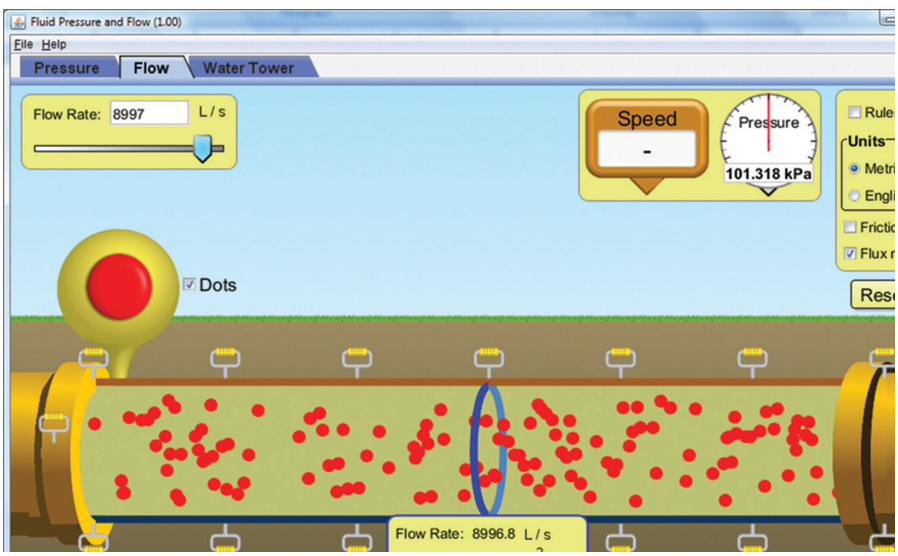
As development and storage costs have come down, there is much experimentation with animation of prior events as well as interactive forecasts of the future. In the previous activity, we noted that timeline tools are especially engaging. Now add rich animation to the mix and the types and forms of learning accelerate.

For instance, in "Visualizing Emancipation," there is an interactive timeline that looks back 150 years to slave emancipation in the United States from January 1, 1861 to January 30, 1866. With this tool, students can watch events unfold over the months and

years of the Civil War. This animation sequence can be paused and reviewed at any time to reveal emancipation events, union army locations, the changing legality of slavery, and event "heatmaps" indicating areas where much news was occurring (Chen, 2012). Any event can be selected and additional information will appear. Such a timeline sheds light on where and when slaves become free during the Civil War. It reveals the complex stories of emancipation through letters, military correspondences, newspaper reports, and assorted diaries of the time. Students could be asked to compare the events and resources found here to other online Civil War records such as "The War of the Rebellion: a Compilation of the Official Records of the Union and Confederate Armies."

Animations like "Visualizing Emancipation" are just one form of media that can enhance learner engagement. We have also seen an increase in simulations and science lab activities for chemistry, physics, biology, and other scientific content areas. The University of Colorado at Boulder, for instance, has built a set of research-based simulations for middle school through college age students called the PhET. These interactive simulations are fun, engaging, and highly informative. In PhET, students test hypotheses and deepen their understanding of important scientific and mathematical phenomena. Instruments like stopwatches, voltmeters, and thermometers allow users to measure or view the results of different tests or settings. For instance, learners can see what happens in a fluid and pressure simulation when flow rate, gravity, or fluid density is manipulated. In this particular simulation, the learner can predict pressure in a variety of situations as well as how fluid motion affects the pressure and how to convert water pressure to water velocity (see Figure 11.1).

FIGURE 11.1: FLUID PRESSURE AND FLOW SIMULATION FROM THE PhET INTERACTIVE SIMULATIONS PROJECT AT THE UNIVERSITY OF COLORADO (PhET).



Other physics-related simulations include magnets, sound, light, radiation, electricity, and circuits. Students can explore generators, Ohm's Law, battery voltage, and semiconductors, among many other concepts. In addition to physics, there are dozens more simulations for biology, chemistry, earth science, and mathematics, each of which is available in other languages such as Chinese, Serbian, Korean, Turkish, Arabic, Spanish, and many more. It is a stockpile of math and scientific concepts vital for digital learning

in the twenty-first century; especially in an age of vast concern about student abilities related to STEM. Suffice it to say, PhET is an amazing resource!

Another simulation we found exceptionally engaging is an interactive guide to toxic substances and the environment. This simulation, developed by the National Library of Medicine in Bethesda, Maryland, is called Toxic Town. Users of Toxic Town are typically in high school or college. When in the simulation, they can explore a port, town, city, farm, or the US-Mexico border community and discover different types of environmental hazards. If the user selects a port neighborhood, options appear for different port locations such as the beach, cruise ship, river, and fish farm with links to health and hazardous material information for each one. After selecting beach, for example, links will appear for information related to sun exposure, drowning, water pollution, water safety, and oil spills. The selection of office locations will bring up issues of drinking water, ergonomics, molds, secondhand smoke, and so on. In effect, Toxic Town is a fascinating review of the chemicals and substances that are encountered in a variety of environments or situations.

These are but a few examples of animations, simulations, and pop-up media that can augment and potentially transform learning. Simulations of manufacturing environments exist for business classes, school simulations for education classes, and mock courtrooms for law courses. Each is ripe for engaging learners.

Skills and Objectives. Includes empathy, visual discrimination skills, reflection, learner involvement, insight, trial and error testing, intrigue, learning through multimedia, self-directed learning and resource exploration, comparing and contrasting, visual encoding of information, and application of what was learned. Clearly, such animation and simulation tools provide rich ways to grasp complex content.

Advice and Ideas. Conduct literature reviews and online searches for animations and simulations in your discipline. Search open educational resources such as MERLOT, Connexions, Jorum, and the Open Educational Resources Commons for such media elements. Also talk to colleagues known for their creative and engaging pedagogy. Be sure to obtain the necessary copyright permission to use their materials. Given that animations and simulations can be powerful learning tools, make sure that they match your course learning goals and objectives. Also consider focusing student search and use with guiding questions and activities. When done, debrief on the activity and discuss other possible uses and activities.

Variations and Extensions. An animation, simulation, or pop-up media element could be used to start class discussion, or as a conceptual anchor for later discussion. Consider asking students to rate such resources at the end of the semester. Alternatively, students could sign up to find and present one or more forms of media during the semester. In this way, the pool of media elements continues to expand.

Key Instructional Considerations

Risk index: Medium
Time index: Medium
Cost index: Low to high (depending on availability)
Learner-centered index: High
Duration of the learning activity: 1–2 weeks or as needed

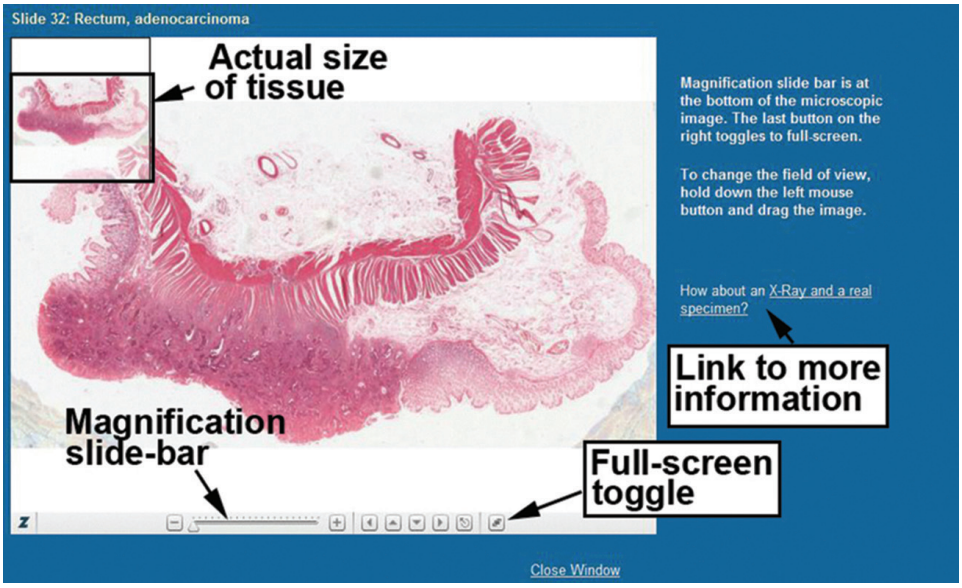
Activity 76. Virtual Tools & Scientific Instruments

Description and Purpose of Activity. The Web offers innumerable new ways to manipulate objects and understand content without stepping into the real world. Many tools and objects are first touched and employed in a virtual space. It is a safe harbor for experimentation, hypothesis generation, and reflection. Such devices include drawing tools for architects, interactive spreadsheets for accountants, virtual companies for future business managers, virtual telescopes for budding astronomers, and online grade books and student portfolios for teacher trainees.

Virtual microscopes are popular in training future biologists, pathologists, and biomedical scientists. In the case of virtual microscopy, an entire microscopic slide is scanned at great detail and stored as a series of indexed, tiled images. When a student, physician, or researcher accesses the digitized slide, the indexed images are streamed and organized on the client's monitor based on the location of the client's cursor. Moving the cursor changes the field of view while a slide-bar permits change in magnification.

Unlike traditional courses in pathology and histology where microscopic glass slides can become faded or clouded by aging, smeared with dirt, or even broken, virtual samples can be reused by unlimited numbers of students without such concerns or constraints. In addition, students can change the brightness, opacity, contrast, area to be studied, and magnification (see Figure 11.2). They can also capture the screen image, write a caption, provide a comment, or insert an annotation related to what they found. Such features foster innovative ways for instructors to promote cooperative learning and the peer-to-peer sharing of information. A virtual microscope sample might contain an endoscopic biopsy, a surgical specimen, a blood smear, or even a doctor's office biopsy.

FIGURE 11.2: FEATURES OF VIRTUAL MICROSCOPE (Courtesy Of Dr. Mark Braun, Indiana University).

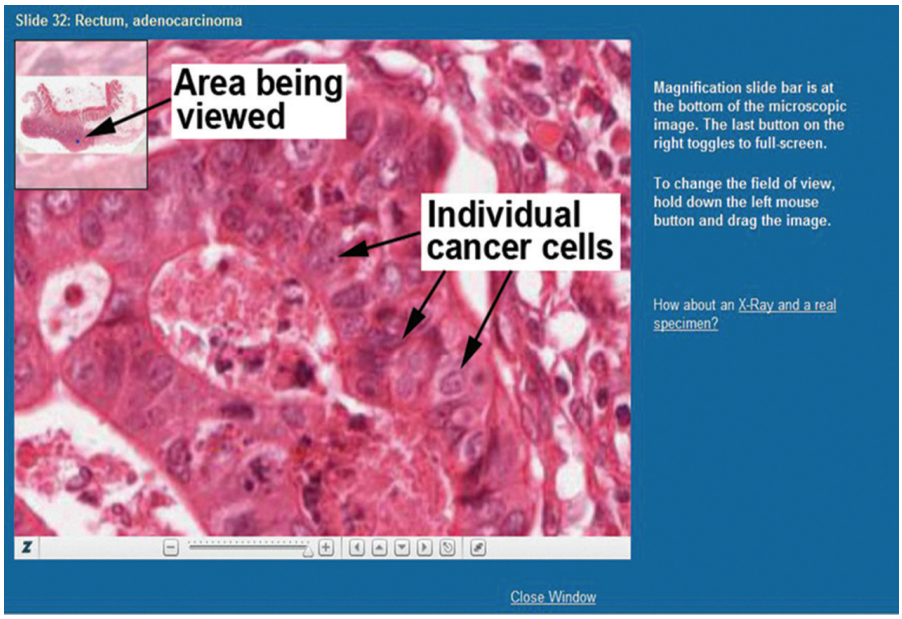


According to Dr. Mark Braun in the pathology department at Indiana University (IU) in Bloomington, Indiana, second-year IU medical students must complete all of their

graded laboratory assignments and related assessments online. For the individual assignments, each student receives an e-mail message with links to virtual microscopic samples of conditions they have previously been assigned (see Figure 11.3 for a sample slide). Students are required to describe and diagnose the "unknown" microscopic sample. To assist in this process, each assessment exercise comes with a short medical history and appropriate clinical laboratory or X-ray data. As they work their way through a problem, students are required to describe the salient features of the tissue sample that supports their diagnosis.

A related group exercise reverses this process. In this case, previously designated groups of four to five medical students work collectively. Each member of the group receives the same e-mail of a link to a virtual microscopic slide. Their job is to identify the name of the organ that the biopsy came from and provide a short diagnosis. Now, instead of describing the salient microscopic features of the mystery challenger slide, each group must collectively write a plausible clinical scenario of that patient. In addition, they must devise clinical laboratory results, and possibly X-ray findings, compatible with the condition that they feel the slide represents. When done, the group collectively authors two multiple choice–style questions regarding their diagnosis and clinical scenario. Groups are given about thirty minutes to complete their scenarios and questions. Finally, all groups present their work to the class during a discussion session.

FIGURE 11.3: SAMPLE SLIDE OF CANCER CELLS WITH VIRTUAL MICROSCOPE (Courtesy of Dr. Mark Braun, Indiana University).



Skills and Objectives. Includes excitement and involvement in learning, discovery and inquiry learning, analysis, visual discrimination skills, data analysis, evaluation, self-directed learning, and the application of what was learned. Learners assume the role of scientist as they peer into virtual blood, algae, pollen, mites, human cells, bacteria, viruses, and various microbes.

Advice and Ideas. List the instruments, devices, tools, and artifacts used by professionals and practitioners in your discipline or related to a particular course or unit. Next, conduct a focused search for animations, demonstrations, simulations, or other media related to such devices. Explore the functionality of those discovered. Ask a couple of prior students of the course to rate or rank such media elements. Together you might author a screencasted demonstration of the tool or device if one does not exist. Prior students could also assist you in designing a set of FAQs related to the activity.

Whether you are using virtual microscopes, telescopes, stopwatches, binoculars, or cameras, you should indicate the type of analyses you are expecting, where students should record and share their results, and how they will be evaluated. You might start with a simple task to help adjust students to the virtual environment.

Variations and Extensions. Students could be assigned virtual lab partners with whom they collaboratively complete a set of assignments. Their findings could be posted in a virtual classroom space which is reviewed by two or more other teams. Results across the various teams are compared.

Our friend Professor Braun has a different approach. He has his students view an assortment of slides and then write case scenarios and a few test questions from them. He refers to his method as a reverse problem-based learning approach.

Key Instructional Considerations

Risk index: Low
Time index: Medium
Cost index: Medium
Learner-centered index: High
Duration of the learning activity: 1–2 weeks or as needed

Activity 77. Microblogging Course Discussions

Description and Purpose of Activity. Microblogging has proliferated during the past few years. With technology like Twitter, such microblogging is typically limited to 140 character posts. David Parry, an early adapter of Twitter at the University of Texas at Dallas, finds that it changes the classroom dynamics and gets students to build closer relationships with instructors as well as peers (Briggs, 2008).

Similarly, Professor Reynol Junco of Purdue University has conducted several studies revealing that such technology can engage students in very positive academic ways. In his studies, Twitter encouraged cooperative learning among students, improved contact between students and faculty, offered prompt forms of feedback, increased time on task, provided an outlet to discuss and show respect for diversity, communicated high expectations, and helped students relate course material to their lived experiences (Junco et al., 2010). Not only were students more engaged when using Twitter, but their instructors assumed a more active and participatory role.

Junco and his colleagues have used Twitter as a tool to extend class discussions about book assignments beyond F2F sessions. He and his colleagues have found rich discussions of themes as well as new friendships emerging from the short tweets. In addition to extending class discussions about assigned books, Twitter was used to remind stu-

dents about course assignments and campus events. It also provided a low-stress way to ask questions, support students, organize study groups, and coordinate projects. Some instructors also use Twitter as a means to gather class opinions and to vote on different polling questions. Finally, Twitter can connect online and on-campus students by providing a vehicle to share advice, successes, and struggles while cheering each other on to other course milestones and accomplishments (Billiot, 2011).

Skills and Objectives. Include prompt feedback, peer-to-peer as well as student-instructor interaction, reflection, learner involvement, multiple levels of information processing, responsiveness, resource sharing, and community building. Provides automatic course and general information updates.

Advice and Ideas. Be clear about the activity. Junco and his colleagues, for instance, included four required Twitter assignments during the final four weeks of the semester. In three of them, students were required to post two tweets as well as two replies to other students' posts about what they had read, watched, or browsed. While this occurs, the instructor should monitor the postings and interactions as well as model such behaviors. Instructors may need to conduct a training session or provide an online guide sheet or job aid for those who are unfamiliar with microblogging. Before you do that, conduct a quick poll of student experiences with blogging as well as microblogging.

Our colleague Dr. Noeline Wright at the University of Waikato in New Zealand conducted a study with teacher education students using Twitter to post weekly reflections (Wright, 2011). Her question choices for students included:

- What am I learning now?
- What might I say about my learning right now?
- What do I need to overcome or solve?
- Where am I learning right now?
- What am I going to do next?

Twitter was used successfully during this seven-week teaching practicum to help students stay connected as a community of learners while developing into reflective practitioners.

Variations and Extensions. There are many simple extensions of using Twitter for course discussions. First, you could require students to post one online resource with each Tweet. Second, you could assign them a specific person or pair of people to follow or respond to in Twitter each week. Third, Twitter posts could provide the base or starting point for weekly podcasts produced by the students in the class. Fourth, the Twitter posts could also be used as a means to foster student questions for the instructor to respond to at a set time each week. And fifth, an assignment could be to have students link as many of the weekly Twitter posts as they can into a story, case scenario, or set of course themes.

Key Instructional Considerations

Risk index: Medium
Time index: Medium
Cost index: Low
Learner-centered index: High
Duration of the learning activity: All semester or as needed

Activity 78. Online Subject-Specific Picture Galleries

Description and Purpose of Activity. In previous chapters, we discussed how video and sound can augment or enhance learning. Selecting and rewatching a video segment can be deeply engaging. Content-specific video and audio files, however, can be complex and time-consuming to develop, and instructors may resort to pictures, graphics, charts, and other image files instead. Using images, in fact, can inspire students to delve deeper into a content area. For instance, in physics, inertia is a fundamental principle wherein an object resists changes in its state of motion. An image of a game of tug-of-war could be used to prompt a discussion of how force is exhibited by the push or pull that is exerted upon an object by way of interaction with another object. The force exhibited by participants in tug-of-war when pulling on the rope is transmitted through the rope to opposing team participants.

Not only can force be illustrated through one or more pictures of tug-of-war but other pictures can display inertia or Newton's First Law of Motion (e.g., a hovercraft), equilibrium (e.g., resting a nail or a screw head on a sheet of paper or a table), and constant speed (e.g., a hockey player skating across the ice). Searching that database of pictures, students will also find examples of Newton's Second Law of Motion related to objects accelerating when they experience an unbalanced force (e.g., a bicyclist falling down). Also contained in that portal of pictures will be those that exemplify Newton's Third law that states that for every action there is an equal and opposite reaction. This principle can be graphically illustrated by a photograph of a bug splattered on a windshield. Want more? Speed of objects, friction, acceleration, circular motion, and so on, can all be displayed through pictures of stopwatches, Ferris wheels, speedometers, radar guns, games of billiards, speed motion detectors, snowboarding, skydiving, and so forth. Fortunately, access to such resources is nearly instantaneous today.

Pictures can help the learner understand laws and principles related to light refraction, energy, static electricity, and sound waves. In fact, photos can assist students in almost any content area or discipline. In particular, they can enhance the learning of history, geography, statistics, politics, and sociology. Rich sets of pictures for cities like Salt Lake City, Chicago, Buenos Aires, Manila, Seoul, or Helsinki can help students understand how a city evolved over time. Pictures of different animals can bring to life text-related information about endangered species and the loss of habitat.

What is clear is that we are no longer limited by what the publisher has provided in textbooks, digital media, or other supplemental resources. Today, instructors have ready access to digital images from award-winning photographers and established organizations like National Geographic, the BBC, and Earthwatch. In addition to websites from established institutions and nonprofit organizations, instructors can now link any activity, assignment, or project to visual image resource-sharing sites like Flickr, Picasa, Photobucket, Pinterest, and SmugMug.

Physics, earth science, and biology class tasks might entail linkages from theory to the real world. Students might be asked to find a visual that represents a term, concept, idea, or principle. Other activities might be self-paced matching tests or quizzes or reflections

on how a particular photo or illustration depicts a key term. Photos can also be repackaged into visual glossaries and chapter concept overviews.

Skills and Objectives. Include visual discrimination skills, reflection, matching, evaluation, dual coding of content, comparison and contrast, visual thinking, multimedia learning, and application of what was learned. These techniques strengthen student conceptual understanding and provide multiple cues for retrieval.

Advice and Ideas. Reflect on how you might augment or enhance your class with a photo sharing site. Spend an hour or two searching for photos and other visual elements related to your field or course. As part of this effort, be sure to search Creative Commons for freely available photos. Index or bookmark those photos that are comprehensive, eye-catching, or show promise. If the usage rights are not clearly spelled out, write to the author or designer for permission to use in your classes.

Place different pictures in a wiki and have the students work in small teams to explain the concepts that are demonstrated. You could also have them sequence pictures according to stages or phases of a theory or perspective. Another idea is to provide a series of pictures for each concept and ask students to rank the quality of each picture or find the best match. In this way, students become more engaged in the task than they would simply reading or browsing content. To foster critical thinking, they could be required to rate, rank, compare and contrast, or evaluate each image. Students might also use tools like VoiceThread to comment on a sequence of pictures that teammates could expand upon or other teams could counter and debate.

Variations and Extensions. Students could add to the database of photographs with one or more of their own. Consider establishing a discussion forum for students to comment on each other's visual connections. The top three or four such visuals can then be added to the database for the next time the course is taught.

Key Instructional Considerations

Risk index: Low
Time index: Medium
Cost index: Low
Learner-centered index: Medium
Duration of the learning activity: Anytime as needed

Activity 79. Interactive Online Exhibits (e.g., Art and Bones)

Description and Purpose of Activity. Learners are often most engaged when they can manipulate objects and artifacts that they are learning about or can experience them in different ways. In the past, those teaching art relied on books, slide images, and visits to an art museum. Today it is increasingly common to experience art and other types of museums virtually. In fact, virtual encounters with art are likely much more common today than physical experiences.

Instructors of art, literature, history, world cultures, and many other topics can explore the Google Art Project. Places to explore virtually include the National Gallery

in London, the Art Gallery of New South Wales, the Museum of Modern Art (MoMA) in New York, the Hong Kong Heritage Museum, and the Tokyo National Museum. In a word, the Web is expansive.

Immersed in the Google Art Project, the user can search over 32,000 artworks in high resolution, more than 150 art museum or institute collections, and 5,400 user galleries, representing the work of thousands of artists. The browsing can take place by type of art, artist, the artwork, the museum, and the country, city, and collection (Google, 2012). Often, there are only partial views of what a particular museum holds; still, the Google Art Project is extremely rich in culture and content. As with Street View in Google Maps, the user can walk down museum hallways and approach different pieces of art for close-up views (Croxall, 2011). In fact, with zooming capabilities, the close-up views are quite stunning. Google includes details of the catalogue and viewing notes as well as links to other pieces of work by that artist. It even includes links to associated videos in YouTube if available. Finally, users can build their own collections of favorites and share those collections publicly.

The Google Art Project is not the only game in town. Such resources are also available for disciplines like archaeology and anthropology. For instance, there is an amazing virtual tour of the Smithsonian National Museum of Natural History. For those wanting to explore actual bones of animals, anthropology Professor Herbert Maschner of Idaho State University has developed a "Virtual Zooarchaeology of the Arctic Project" that includes an online, interactive, virtual museum of animal bones from the North American Arctic as well as Greenland, including fish, birds, and mammals (Monaghan, 2011). Once there, visitors will find thousands of two- and three-dimensional images to search through.

Skills and Objectives. Include interactivity, student autonomy and choice, reflection, visual discrimination skills, multimedia learning, data analysis, evaluation, comparison and contrast, visual thinking, inquiry, self-directed learning and resource exploration, and identification of key concepts. There are ample hands-on learning experiences as learners experience the artifact, product, or item.

Advice and Ideas. If you find virtual exhibits in your domain, you can embed them in many ways. First, the exhibit can be a supplement to course readings for one or more weeks. In a psychology course, for instance, students could engage in specific well-known experiments that display particular principles or concepts (e.g., figure-ground experiments in perceptual psychology). They could write reviews of the exhibit and reflect on how such principles are used in real life. In art or art history classes, virtual exhibits can bring students closer to a particular masterpiece or a less well-known part of a collection. Students can write reflection papers on their encounters with the works of one or more artists. Alternatively, prior to the virtual experience, they can read background materials on a particular artist, exhibit, or time period, reflecting on the degree to which the experience matched their incoming expectations.

Reflection papers are one form of engagement. Instructors may also consider having teams of students create a rubric for evaluating the interactive online exhibit and overall experience. Next, they should write reflections papers on the collaboration process as well as the resulting rubric.

Variations and Extensions. Consider surveying students on the user experience, including questions probing specific interactive features or content that could be added to the user experience. Alternatively, have students create surveys for users of a particular site, and then send the survey results and written report to the site development team. Such research could also be presented at conferences.

Key Instructional Considerations

Risk index: Medium
Time index: Medium
Cost index: Low
Learner-centered index: Medium
Duration of the learning activity: Anytime as needed

Activity 80. Three-Level Questioning

Description and Purpose of Activity. Since ancient Athens, engagement and involvement in learning were often made salient through different forms of questioning. During the past few decades, educational researchers have dug deeply into the types and levels of questions asked in the classroom. Whether in K–12 or higher education settings, what they discovered was that the instructional focus is too often at the knowledge level, which, as many know, is the lowest level of Bloom's famed taxonomy. Here, learners are asked to match, list, or identify something. Some educators suggest asking questions at all six levels of Bloom, namely, knowledge, comprehension, application, analysis, synthesis, and evaluation.

There are simpler ways to foster discussion than the six levels of Bloom. Arthur Costa, for instance, introduced the three-level questioning technique. At Level 1, the questions asked are at the factual level to determine what students do and do not know. This is akin to the first level of Bloom's taxonomy (i.e., knowledge). For instance, you may ask, "What do you know about this particular case or situation already?" or "What is the formula or equation for this problem?" Common knowledge level words include name, define, state, label, select, and recall.

At Level 2, the questioning shifts to interpretation and analysis, not just facts. Interpretative questions address implications of different results or data, the motives or causes of a particular historical event or recent news reports, and searching for relationships between pieces of information that are provided. Words like organize, grouping, break down, compare and contrast, infer, and sequence could be used here.

At Level 3, thinking shifts to still higher-level concerns where learners evaluate datasets and make hypotheses about a particular psychological experiment. They may also use their imaginations to design a model or framework, compose a poem or song, or make predictions about a company's performance or the entire industry sector. Commons words here include decide, summarize, evaluate, apply, assess, construct, and critique.

With such a three-level framework in hand, an instructor can attempt to foster different types of thinking in an online discussion forum or in a synchronous class chat or reflection activity. One or more questions of each type can be posted weekly. Alternatively,

instructors could have a question at each of the three levels for every article, chapter, or other resource required for the week.

Skills and Objectives. Includes feedback, fostering reflection, evaluation, comprehension, concept attainment, depth of information processing, and content review. With multiple levels of questioning, there are alternative ways for learners to demonstrate their learning.

Advice and Ideas. Be clear regarding how many questions to address each week as well as the length of responses. Also provide explicit assessment criteria. Consider having three separate discussion forums each week: one for factual or declarative questions, one for interpretative types of questions, and one for application and evaluation questions. Alternatively, three or more questions could be embedded within discussion threads for each article or topic of discussion. Instructors may also consider adopting a policy of including several of these discussion forum or practice questions on course quizzes and examinations.

Experiment with other forms of questioning or make up your own system. The important factor is to push students to reflect on what they are reading, browsing, exploring, or critiquing. With the wealth of content available online today, it is vital to find ways to involve or engage your students in the content. Perhaps have them cite page numbers or mention new concepts learned each time they post. You could also have them offer linkages between concepts mentioned in two or more postings. And each time a student posts a response or answer to a particular reflection question posed by the instructor or fellow students, that person must also reply to one or more peer posts. You may also employ the "three sentence" rule detailed in Starter-Wrapper Technique (Activity #43) in Chapter Eight.

Bear in mind that incorporating Costa's ideas about levels of questioning into your fully online and blended courses will only work if you are explicit about the purpose of the activity with your students. You could attempt to foster metacognitive aspects of reading and writing by requiring short and perhaps sporadic reflection papers on their responses to the questions. Remember Claude Cookman's TAR method back in Chapter Six when discussing Just-in-Time-Teaching (Activity #25). Using the TARs approach to capture student comprehension of the content in a discussion forum prior to class can help the instructor shift the live class session toward student interests as well as misconceptions.

Variations and Extensions. One obvious variation would be to assign students to design their own sets of questions and post them to the course management system. Another extension could be to use four, five, or six levels of questions; for example, following Bloom's taxonomy, have students post questions at the following six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. At the end of the course, students could be asked to select the best questions posted from each of the six categories of Bloom. You could reuse the highest-rated questions during the following semester.

Key Instructional Considerations

Risk index: Low
Time index: Medium
Cost index: Low
Learner-centered index: Medium
Duration of the learning activity: 1–2 weeks or as needed

Final Reflections on Engagement

There is little doubt that students want to be involved and engaged in the learning process. When that happens, there are increased levels of student investment and effort. The ramifications are immense. If an instructor or entire program found ways to engage learners at higher levels than normal, retention and completion rates would certainly rise. As Richardson and Newby (2006) argue, we hope that some of the ideas we have mapped out can help professional educators design more engaging and successful online learning environments and activities.

The forms of engagement discussed in this chapter have mainly addressed the learner-content variety though we included a couple of learner-learner and learner-instructor interaction ideas as well. Our examples included the use of interactive timeline tools, exhibits, glossaries, simulations, talking dictionaries, comprehensive databases, and scientific equipment like virtual microscopes. We also described new forms of pop-up media that can engage learners as they read a digital book or browse an online portal or reference resource. In addition, with creative insights and a bit of thoughtful tinkering, engagement can be fostered by using the countless free and open picture galleries, sound clips, Twitter feeds, and animation files at our disposal today. What might have been deemed a static picture can quickly come to life when juxtaposed against difficult course concepts and thorny theoretical principles that the picture helps to clarify.

Such forms of learner-content engagement are proliferating so quickly that it is extremely difficult to keep up. Without a doubt, there will be many unique ways for learner engagement and involvement that will spring up during the coming decade in every discipline. These learner-content experiences will feel highly authentic and visually realistic. As virtual spaces increase in fidelity and take on an increasing sense of realism, there will be a reduced need for early field experiences and direct contact with the materials, resources, and tools of the practitioner. This is not to say that physical experiences will no longer be important. What we do believe, however, is that Principle #8 of the TEC-VARIETY model will become a centerpiece of most any fully online or blended course or experience. To raise completion rates and success, the recent emergence of MOOCs and other unique course delivery methods and innovations will need to incorporate activities for greater learner engagement and investment in the learning process. Electronic page turning will no longer suffice.

The ideas mapped out in this chapter can only be a starting point. It is up to you to find the content, resources, and tools that can send learner engagement soaring to new heights. As already mentioned several times, the focus of the previous chapter on learner-learner interactivity should be combined with the learner-content examples of this chapter. Additional forms of learner-content and learner-learner interactivity and engagement are discussed in the following chapter. Chapter Twelve is concerned with taking advantage of the power of tension and conflict or sense of dissonance when learners realize that they do not have all the requisite skills and knowledge or that they actually misunderstand a key term or concept. When that is case, learners are motivated to seek out additional information. Online instructors and instructional designers must find innovative ways to take advantage of such a sense of controversy, conflict, and bewilderment. Effective learning environments include collaboration and engagement,

discussed in the previous two chapters, as well as some sense of conflict and competition elaborated on in the next. Just witness the success of massive multiplayer online gaming.

And so we push on to a chapter on how to foster some sense of conflict and competition. In Chapter Twelve, we will discuss Principle #9, namely, Tension as well as Challenge, Dissonance, and Controversy. Before you turn the page, we want you to reflect on the times in which you were tense or felt a state of dissonance and then sought additional information. Then list the factors that nudged you to want to learn more. What were they? How might you take advantage of such forms of dissonance in your fully online and blended courses? Read on.

Praise for *Adding Some TEC-VARIETY*

"There are books on theory and books on practice, however this is the best volume ever written for using learning theory to inform effective practice. This book is a tour de force for creating an environment where students not only succeed in online learning, but they achieve excellence as well."

—**Charles (Chuck) Dziuban,** Director, Research Initiative for Teaching Effectiveness (RITE), Professor Emeritus and Inaugural Pegasus Professor, University of Central Florida, and Sloan-C Fellow

"An excellent book from world leaders in the field that will be of great value for educators and designers. Presents concrete examples grounded in solid 'practical' theory."

—**Charalambos Vrasidas,** Executive Director of the Center for the Advancement of Research & Development in Educational Technology (CARDET), Associate Dean for elearning, University of Nicosia, Cyprus, and author of several information technology and distance learning books

Based on 10 theoretically driven and proven motivational principles, *Adding Some TEC-VARIETY* offers 100 practical yet innovative ideas to motivate online learners and increase learner retention.

What motivates?

1. **Tone/Climate:** Psychological Safety, Comfort, Sense of Belonging
2. **Encouragement:** Feedback, Responsiveness, Praise, Supports
3. **Curiosity:** Surprise, Intrigue, Unknowns
4. **Variety:** Novelty, Fun, Fantasy
5. **Autonomy:** Choice, Control, Flexibility, Opportunities
6. **Relevance:** Meaningful, Authentic, Interesting
7. **Interactivity:** Collaborative, Team-Based, Community
8. **Engagement:** Effort, Involvement, Investment
9. **Tension:** Challenge, Dissonance, Controversy
10. **Yielding Products:** Goal Driven, Purposeful Vision, Ownership

This is the book you need to grow your online teaching repertoire in innovative ways that will grab your students' attention and imagination. **Additional book resources as well as a free e-book are available for download at http://tec-variety.com.**

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