Getting Started with Technology

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The phrase "teaching with technology" may conjure up a variety of different images depending on our own experiences as instructors, students, or even conference attendees. For some it might mean using PowerPoint or student classroom response systems in lectures; others may think of podcasting lectures; and still others may think of specific disciplinary applications, such as designing Web-based interactive learning modules and simulations to teach skills and concepts. While it is natural to think of the tool itself as a starting point, the use of instructional technology is more likely to be effective and appropriate (i.e., facilitate student learning and increase your own productivity) if it is integrated into a careful planning process that takes into account the various factors involved in teaching and learning.

From a systems approach, teaching with technology involves four major components: the course content, the instructor, the students and the technology tools (See Figure 17.1.). We need to attend to each component in order to make technology integration as successful as possible.

Each of these components is discussed in more detail below.

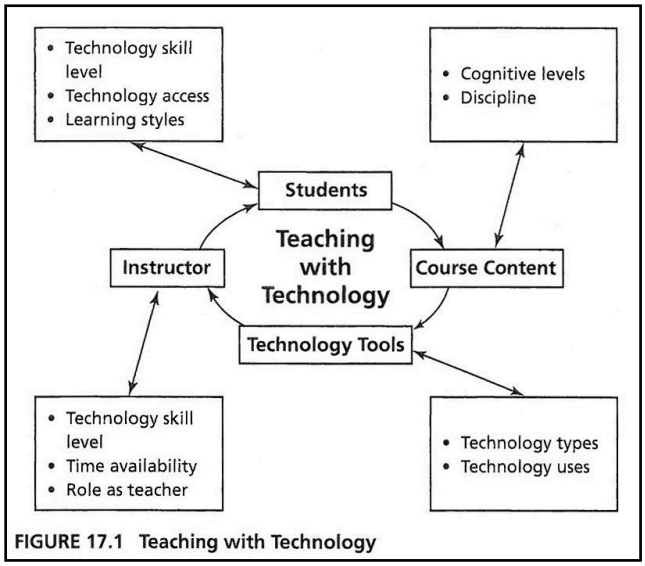

FIGURE 17.1 Teaching with Technology

Course Content

In order to use technology effectively in teaching, we must examine our course goals as we do when we plan a new course. What do you expect students to learn from the course? What skills and knowledge do you want them to acquire by the end of the term? What teaching strategies (lecture, discussion, group work, case studies, etc.) will best help students achieve these goals? Once you have answers to these questions, you can choose the appropriate technologies and design learning activities to help students reach the learning goals, and even employ technology to assess student learning.

To help make the connection between goals and technology tools, we can turn to the taxonomy of educational objectives developed by Benjamin Bloom (1956) and revised by Anderson and Krathwohl (2001). Objectives at the lower levels of the taxonomy involve acquisition of factual knowledge or development of basic comprehension. Higher-level learning involves skills such as analysis, evaluation, and creation. Figure 17.2 briefly illustrates the basis for selecting technology in accordance with this taxonomy of objectives.

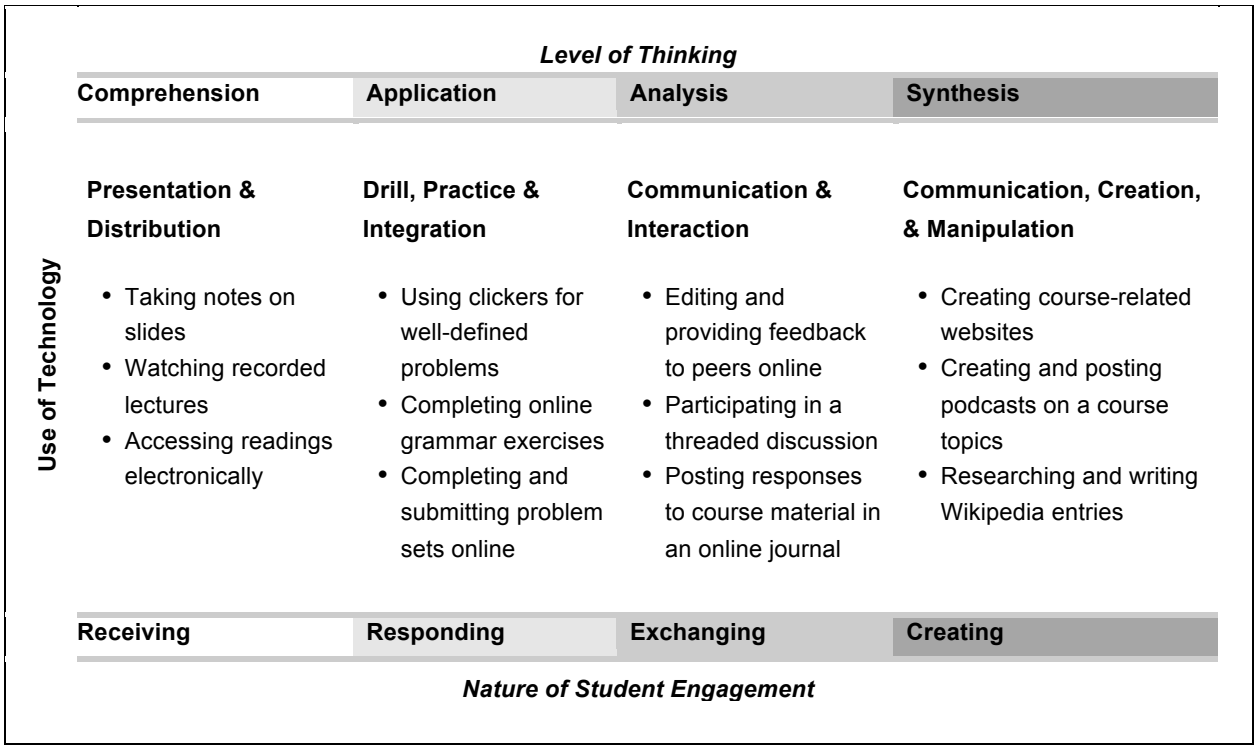

Figure 17.2 Technology and Learning Objectives

For example, if you want students to record and remember materials effectively, you could use software programs such as Microsoft PowerPoint to ensure clear, readable outlines and post them online so that students have easy access for review and correction of their own notes. However, if you also wish to promote critical thinking through active learning during lectures, software programs alone may not be the best choice. Presentation software can lead to a teacher-centered mode of instruction in which students are relatively passive spectators (Creed, 1997). To avoid placing students in a passive learning mode, you will need to incorporate activities that engage students in performing tasks, actively thinking, and reflecting on their own actions. In this case, you can supplement PowerPoint slides with the use of a classroom response system ("clickers") to involve students actively in lecture and reinforce their understanding. You could also extend the discussion of difficult concepts or problems beyond the class in an online space such as a discussion board or a blog space.

The Instructor

Once you have a clear view of the course goals and learning objectives and how technology can support students' achievement of the goals, you will need to ask some questions about your own skills and confidence: 1) How skilled and experienced are you in using technology? 2) How much time do you have for course planning and selecting teaching strategies suited to your choices of technology? 3) What is your role as an instructor?

If you have little or no experience using technology, it might make sense to start slowly with tools that are established and easy to use so that you build your confidence and support your students' learning. You can learn from colleagues in your department or attend a technology workshop to get started with software programs commonly used at your institution.

The time you have available for course planning and skill development should also influence the extent to which you undertake the integration of technology into your courses. (See Table 17.1.) The more complex and unfamiliar a particular tool is, the more time you will need to dedicate to course planning, development of materials and learning activities, and your own skill development. Time for starting up and managing such activities throughout a term may be greater than you expect or wish to spend on teaching. You need to be aware of this and be ready for such a time commitment when you make the decision to integrate technology into your courses. Failing to do so could negatively impact your teaching and student learning.

Easy (little time) Commonly available and easy-to-learn tools	**Moderate (some time)** More complex learning curve	**Complex (more time)** Specialized software and special training may be necessary
Examples: • Email, listerv • Text-based presentation software • Course Managment Systems • Chat, blog, and bulletin boards	Examples: • Multimedia presentation • Audio or video clips • Websites • Web-conferencing • Podcast • Wiki • Social networks • Collaboration tools	Examples: • Complex animation • Simulation/game • Interactive database • Virtual world or learning environment

Table 17.1 Common Technology Tools and Their Uses

Technology can support student learning, but it can also become a distraction (Lloyd, Dean and Cooper, 2007, p. 493). Research indicates that multitasking (e.g., surfing the Web, texting, or using social networks during lecture) has a negative impact on learning (Clapp, Rubens, Sabharwal, & Gazzaley, 2011; Ellis, Daniels, Jauregui, 2010; Hembrooke & Gay, 2003). You may want to establish ground rules in your class to ensure students get the most out of technology tools, rather than being distracted by them. Having such policies on your syllabus, for example, can help avoid misunderstandings by making your expectations clear from the outset. The following examples can be adapted for your own teaching context:

> *Do not use laptops for entertainment during class and do not display any material on the laptop which may be distracting or offensive to your fellow students. (Northern Michigan University, 2010)*

> *Laptops may be used only for legitimate classroom purposes, such as taking notes, downloading class information from TWEN, or working on an in-class exercise. E-mail, instant messaging, surfing the Internet, reading the news, or playing games are not considered legitimate classroom purposes; such inappropriate laptop use is distracting to those seated around you and is unprofessional. (Mazzie, 2008)*

When you notice students using laptops in lectures only to check Facebook pages or browse websites that are non-related to lectures, you can ask them to close the laptop until it is needed for a specific activity. You can also designate a specific laptop-free location at for students who do use computers in class and do not wish to be distracted by others who do.

One final issue we need to consider in this category is how the instructor views his or her role in the teaching process and how technology integration can support or conflict with that view. If you see your main role in teaching as that of an expert, an authority in a given field whose main task in teaching is to convey information, you may find it disconcerting to discover that the incorporation of technology can situate you as a guide or facilitator. Moreover, in some cases you may discover that your students know more about and are more comfortable with technology than you are. It is best to think carefully about your own view of teaching and learning, how your use of technology might challenge your teaching philosophy and change the dynamics in your class, and whether you are willing to make that shift.

Students

As you adopt technology tools into your courses, you will need to consider students' previous experience with technology, their expectations and access to technology, and the variety of learning styles they bring to your course.

Despite encouraging statistics about students' comfort with technology (http://nces.ed.gov/surveys/frss/publications/2004011/2.asp#one), there are still segments of the population that may be far less familiar with technology. While the digital divide has narrowed over the past several years as Internet connectivity and home ownership of computers have increased, there are still disparities in who has Internet and broadband access and the use of specific technologies. For example, recent reports indicate that households earning higher incomes ($75,000+) use the Internet at much greater rates than lower income households, have higher levels of computer ownership, and are much more likely to use the Internet multiple times each day for a variety of tasks (Jansen, 2010). Similarly, individuals living with disabilities use the Internet at much lower rates than those who do not report disabilities (Fox, 2011).

Thus, it is important not to assume that all students have had the same exposure and access to the technology you plan to use in class. Instead, you can conduct a brief survey at the beginning of the semester to find out where your students stand. Even students who come from households where technology was present might not have spent much time with it and might not be familiar with the applications you expect them to use. For example, a large number of students on college campuses know how to use iTunes and have MP3 players or iPods, but they may not necessarily know how to create a podcast. When you ask students to do a podcast project, a brief orientation to the technology, as well as some tasks that would allow them to learn the technology, will help all students succeed in completing the project and accomplishing course-specific goals. It is also important for you to tell them about the resources available and where they can go for help with technology questions. Finally, you can seek out the office on your campus that supports students with disabilities to learn more about services they offer so that you can be proactive (in your syllabus and in introducing the technology) about discussing accommodations for disabled students.

Beyond addressing differences among students, you will need to consider how technology alters the roles students need to take on in your classes. When you use technology in teaching, students may be required to assume new responsibilities, such as monitoring their own learning goals, setting priorities, and controlling the pace of learning. Some students may not be ready or willing to take on these responsibilities. They may even be resentful of new expectations and challenges because they are used to learning in a passive and responsive way, rather than being active and taking the initiative. If you adopt a more student-centered approach, some students might see it as an abdication of responsibility, rather than a positive development. As you move toward greater student involvement and autonomy, you will

need to explain your rationale for doing so and build in enough structure so that students do not feel lost. The following suggestions should help.

- Be clear about your expectations for using technology for any projects and assignments and tell students how these activities will benefit their learning.
- Build in multiple milestones for independent or group projects so that you can check student progress.
- Provide opportunities for feedback about the class so that you can make minor adjustments when problems arise.
- Discuss options for support should students encounter difficulties.

Technology Tools

Now that we have carefully considered the context of teaching and learning, we can turn to an examination of the technology itself. One of the challenges we all confront is the need to understand the possible uses and functions of an ever-expanding array of technologies. You need to consider which applications are appropriate for your students, disciplinary learning, course content, and teaching style. Not all tools are the same. Some are better at promoting learning in specific content areas while others are useful for a wide range of disciplines. Some technology tools are built for specific instructional goals, while others are more generally applicable.

Examples of various technology tools are available on the CRLT website.

References

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxomony of educational objectives.* New York: Longman.

Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives: The classification of educational goals.* New York: Longman.

Clapp, W. C., Rubens, M. T., Sabharwal, J., & Gazzaley, A. (2011). Deficit in switching between functional brain networks underlies the impact of multitasking on working memory in older adults. *Publications of the National Academy of Sciences, 108*, 7212-7217.

Creed, T. (1997). PowerPoint, No! Cyberspace, Yes. *National Teaching and Learning Forum, 6*(4), 5-7.

Ellis, Y., Daniels, B., & Jauregui, A. (2010). The Effect of multitasking on the grade performance of business students. *Research in Higher Education, 8*(1) 1-11.

Fox, S. (2011) *Americans Living with Disabilities and Their Technology Profile*. Pew Internet and the American Life Project. Available at http://www.pewinternet.org/Reports/2011/Disability.aspx

Hembrooke, H., & Gay, G. (2003). The laptop and the lecture: The effects of multitasking in learning environments. *Journal of Computing in Higher Education, 15*(1), 46-65.

Jansen, J. (2010). *Use of Internet in Higher Income Households*. Pew Internet and the American Life Project. Available at http://www.pewinternet.org/Reports/2010/Better-off-households/Overview.aspx

Lloyd, J. M., Dean, L. A., & Cooper, D. L. (2007) Students' technology use and its effects on peer relationships, academic involvement, and healthy lifestyles. *NASPA Journal, 44*(3), 481-495.

Mazzie, L. (2008, October 27). Is a laptop–free zone the answer to the laptop debate [Web log post]? Retrieved from http://law.marquette.edu/facultyblog/2008/10/27/is-a-laptop-freezone-the-answer-to-the-laptop-debate/

Northern Michigan University Instructional Design and Technology. (2010). Suggestions for laptop use in classrooms. Retrieved from http://idt.nmu.edu/laptopuse.php