

Creating a module: A Personal Journey towards Incorporating Technology

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I am a middle-aged physical science professor at a rural two-year community college in extreme downstate Illinois where I teach courses in Earth Science and Physics for non-science majors. My educational background does not include any courses in education or educational methods, nor do I have an extensive transcript of computer courses.

A few years back I was asked if I would be willing to develop some “technology-infused modules” for the courses I teach. I thought that sounded interesting, and agreed to the project, but was unclear about what was meant by “technology” and “module.” It soon became apparent that the reference was to digital technology (i.e. computers) and the modules could be a lesson or a topic that I covered in class. This all sounded fairly straightforward and I started to plan my first module. What follows is a general account of that process.

The first step was to decide on what type of technology would be appropriate. In other words, should I incorporate spreadsheets, electronic portfolios, web searches, word processing, discussion groups, etc? There was so much out there that I didn’t know exactly where to start! I decided that the easiest and simplest technologies to use would be the ones I am currently using and hence am the most comfortable with. This included presentation software (PowerPoint), acquiring information from the Internet, and using prepackaged animation software. This way I could concentrate on adapting topics to the technology and not spend all my time learning a new technology. Furthermore, I didn’t want to develop a module that unnecessarily distracted the student away from the topic or lesson at hand. I saw my role as enhancing learning by *using* technology and not *teaching* the technology. I also made the assumption that most students today possess basic computer skills and are familiar with navigating the Internet.

I had focused on the type of technology that I wanted to incorporate and needed to examine my teaching area to find topics that might be enhanced by computer-based learning. For me it came down to two questions: “What topics do I teach that students have difficulty understanding using the traditional lecture/textbook format?” and “What type of technology (software, hardware, online resources, etc.) is available to support these concepts?” Every teacher probably would have different answers to the first question, but after doing some research for the second question it was my conclusion that there is no shortage of technological resources available. In my case, and for reasons I won’t get into here, I decided to develop modules for a lecture on minerals and a laboratory dealing with maps.

My original thought for the mineral module was to download an animation plug-in and use it to supplement a lecture session on mineral properties. It was free for educational

purposes, many mineral structures were available on the web, and the mineral diagrams in the textbook were not very impressive. I proceeded to write up the instructions for the module and to explain how it might be used in the classroom as a lecture aid. Then I realized that students could operate the animations themselves on laptops and the module could be adapted to a lab exercise on minerals. Additionally, I discovered that many excellent mineral sites were available on the Internet and could be accessed outside of class. In the final stage, what had started as a simple lecture demonstration module had evolved into a complete stand-alone, computer-based lab exercise. Students downloaded software, researched various minerals specimens (some not easily obtainable), and applied what they learned to the traditional lab. I may again refine the module by assigning minerals to student groups and having them develop a presentation for the class.

The same evolutionary process occurred when I developed the module on maps. I originally intended to use computer animations to explain a lab exercise. After a few revisions, students were using individual laptops to manipulate the program and to complete worksheets. Further revisions incorporated downloadable maps from the Internet and a short web-based exercise on GPS technology. In the future, I plan to again revise the module by linking digital maps to photos I have posted on the web. The map modules became so large and complex I was forced to extend them over two lab periods.

Once I settled on a general topic and chose the appropriate technology, the modules seemed to increase in complexity the more I tweaked them. In fact, it soon became a process of how to limit an exercise to a manageable size. From my experience I would like to offer a few things to consider when adapting a lesson to infuse technology:

Self Analysis What types of technology are you already comfortable with? Are you willing (i.e. have time) to learn a new technology? What topics in your subject are you most familiar with or would like to learn more about? In my opinion, try and choose things that you already possess some background in. As the project progresses, you will be surprised at the number of new and interesting ideas you uncover.

Research When I was first given the task of infusing technology into a lesson plan, I was completely dumbfounded as to what I was expected to produce. Search the web, examine some educational journals, and poll some of your fellow students or colleagues for ideas. There is nothing wrong with applying effective practices in a new and innovative way. Some of us, like me, simply need an example to get started. I know that it's out of fashion to suggest this, but don't forget to consult a textbook for ideas.

Hardware Do you own or have access to the proper facilities for your project? Are you capable of solving hardware problems that may, and will, arise? Do you have access to people who can give tech support? Take an inventory of what you already have available. A digital camera or scanner can be used to develop a virtual tour or web page. A graphing calculator can be applied to many data analysis applications.

Start Simple I can't emphasize this enough. Don't devise a plan that is unwieldy at the beginning. As already stated, these projects have a way of snowballing throughout their development. Begin by asking yourself: "What is the main concept that I want to convey to this audience, and what is the most effective way to do it." View technology as a tool and avoid the pitfall of letting it guide the process.

In the end, you might develop a new lesson that could not have been taught without technology. It is likely that you will discover some new things about the subject lesson you are already working with. You might acquire new computing skills, or devise innovative ways to adapt technologies you are presently using. I sincerely believe you will find the experience worthwhile.

Outline for Module Development:

- Evaluate the technological tools you are already familiar with and try to determine the most appropriate to incorporate into a teaching module.
- Choose a subject area topic that you believe would benefit from the infusion of technology.
- Research technology-based resources that could be used to enhance your chosen topic.
- Based on your acquired information and analysis, complete a first draft "working module."
- Field test modules, obtain feedback, and revise as needed.
- Limit your final product to a manageable size and avoid producing something that is overly complex.