

# Teaching with Technology, Setting an Example

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## ABSTRACT

Providing instructional technology support for faculty requires a range of skills, from knowledge of software and hardware, to an ability to communicate, teach workshops, and relate to faculty. Teaching experience is advantageous for the instructional technology specialist in that it can be used to extend discussions of technology to the meaningful use of the technology in the classroom. For these discussions to have authenticity, the technology specialist needs to have classroom teaching experience using software in a technology-equipped classroom. Unfortunately, for the instructional technology specialist, this experience is usually limited to brief workshops, and increasingly, one on one instruction with faculty.

Two Instructional Technology Specialists from Williams College team-taught a four-week long Williams College Winter Study course for college students called "Teaching with Technology." The course focused on creating learning modules using Macromedia Flash and Dreamweaver, Apple iMovie, and Adobe Photoshop. The course also covered copyright, pedagogy, and accessibility, and made use of a course management system.

The shift in perspective for the instructors from supporting the use of technology in the classroom to actively teaching with technology helped the instructors realize the pedagogical potential of electronic classroom tools. In addition, the students demonstrated thoughtful use of the software for teaching, and a regard for copyright and accessibility. Together the students and instructors explored a range of topics relating to the use of technology in the classroom.

In their roles as Instructional Technology Specialists, the instructors advise faculty on the use of technology in the classroom. By teaching the course, the instructors applied and tested their own advice and set an example of how technology can be integrated into a curriculum. This paper covers some of the insights that the authors gained from teaching the course.

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## Categories and Subject Descriptors

K.3.2 [Computers and Education]: Computer Uses in Education

## General Terms

Design, Experimentation, Human Factors

## Keywords

Web Portfolio, Pedagogy, Learning Modules, Multimedia, Technology, Electronic Portfolios, Education, Video, Animation, and Audio.

## 1. INTRODUCTION

Williams College has a January term when four-week courses are offered pass/fail. These courses are typically exploratory and taught by a combination of faculty, alumni, community members, and adjuncts. The Instructional Technology group of the Office for Information Technology at Williams College assembled proposals for courses for January of 2003. OIT staff offering Winter Study courses was an experiment without precedent.

Reasons for offering a winter study course included:

- adding credibility to Instructional Technology through visible use of technology in the classroom;
- educating students who might provide technology support for faculty in the future;
- improving technology/software workshops through practice and the development of workshop examples;
- obtaining instruction and technology feedback from students;
- improving training for students who work on faculty proposed technology projects over the summer;
- field testing software, hardware, and electronic classrooms;
- professional development of instructional technology staff;
- and being able to relate real electronic classroom teaching experience with faculty.

The goal of the course was to have students develop a web based learning module using Photoshop, Dreamweaver, iMovie, and Flash. These applications were selected based on the variety of content types that they could accommodate. Students completed assignments on copyright, accessibility, and pedagogy that were to accompany their learning module. A course management

system, Blackboard, was used to post assignments, sample content, tutorials, and other resources.

The final project consisted of a web-based home page and navigation system that linked to students' movies and animations as well as to papers on accessibility, copyright, and teaching methods related to their specific projects.

Eight students enrolled. No technology background was assumed or required. The course was team taught by the authors, two Instructional Technology Specialists from Williams College, in a PC computer lab with a SmartBoard and data projection.

## 2. PROJECTS

The instructors talked to students about teaching methods and ideas that would guide the students toward a successful project. The instructors cited a list of situations where technology would most likely be beneficial [1]:

- instruction cost is high
- safety is a concern
- materials which are difficult to teach by other methods
- extensive learner practice is needed
- learner motivation is lacking
- traditional method leads to logistical difficulties
- learners have special needs

Students were directed to <http://www.merlot.org> [2] as a place to look for ideas or to see what has been done in a particular subject. It took some time for the students to develop ideas for topics to focus on. As soon as one student selected an athletic topic, the majority of the class suddenly opted for athletic topics. The topics the students came up with for their Winter Study project were:

- Broomball Strategy – fast-break
- Yoga for the lower back
- Frisbee – how to throw a forehand
- Weight Lifting – bench press
- Skiing – the basics of a GS turn
- Irish Step Dancing – slip jig
- Economic Model – Boycotting vs. Government Regulation: consumers in a political market
- Golf – the swing plane

Most of these topics fall under the "extensive learner practice is needed" category. While students certainly would encounter pedagogical issues in the development of their projects, the instructors feared that similar project types would limit the diversity of instructional approaches. Also, athletic topics do not fit many of Alessi and Trollip's [1] list of situations where technology is likely to be beneficial. Despite the fears of the instructors, students employed a range of effective pedagogical methods.

## 3. PEDAGOGY

### 3.1 Teaching the Course

OIT at Williams College offers about fifteen workshops per semester. Most of the classes are 90 minute sessions taught by Instructional Technology Specialists. Workshops are usually tool specific, covering software applications such as Photoshop or video editing with iMovie. The Winter Study course gave Instructional Technology Specialists an opportunity to team-teach a four-week long, intensive, hands-on, and project based course. The instructors created a list of topics necessary to reach the final goal of a successful student project. These topics included:

- planning: choosing a topic, project planning;
- software: ElementK, Blackboard, Dreamweaver, Photoshop, Flash, iMovie, audio recording;
- development: copyright, design and layout, accessibility, typography, pedagogy, file management, how to critique multimedia;
- production: technical writing, CD burning;
- presenting the final projects.

The Library of Congress website [3] was used as a resource for covering copyright. Sarah Horton's NERCOMP SIG materials [4] were used to cover accessibility.

The instructors team-taught the course. Both instructors were present for each two-hour class. When one instructor was covering content, the second instructor would assist students with technical questions or help the students catch up to the group if they fell behind. This technique of alternating lead instructor made preparation for each class more manageable. An instructor would have three hours of content delivery to prepare for the class per week rather than six.

Blackboard was used to distribute course documents, references to websites, examples of work in Flash and Photoshop, and assignments. Assignments were collected using the discussion board feature of Blackboard making them visible to the other students in the class. Posted assignments were time stamped by Blackboard revealing which students submitted assignments on time and which students posted them during class on the day they were due. Blackboard statistics also showed the amount of time students used Blackboard and also served as an indicator of which students were falling behind.

The Winter Study class took a day trip to Middlebury College, where a similar winter term course was being taught, to attend a session where students and faculty discussed technology and pedagogy. Discussion covered the logistics of teaching a course with technology, the pros and cons of specific applications, the benefits of student access to course content in between classes, student reactions to the use of technology, and pedagogical methods. Several Middlebury faculty explained how they use technology in the classroom. The trip to Middlebury provided students with a reminder of the big picture of what teaching with technology is about.

Students critiqued each other's work during the final week and practiced for their final presentation. The final presentation was public. Members of the Williams College Office for Information Technology and Williams College faculty attended.

### 3.2 Student Work

The students were resourceful in finding the pedagogically useful features of the technology and applying them to learning content. Many of the modules included video for demonstrating physical motion. Some creative video techniques were employed including slow motion, still frames with text in video, and using video for motivation. Also impressive was the use of animation to cover equations in the economic model project.

Techniques used in student projects included:

#### 3.2.1 Video: Slow motion and still frames

While the Frisbee module made use of slow motion, the skiing module would freeze on a frame reflecting one of the four phases of the GS turn with text to describe the phase and how it leads to the next phase of the GS turn. The video returns to full speed until the next phase is reached where it again freezes to present more text. The result was an effective presentation of content in the context of the whole process of completing a GS turn.

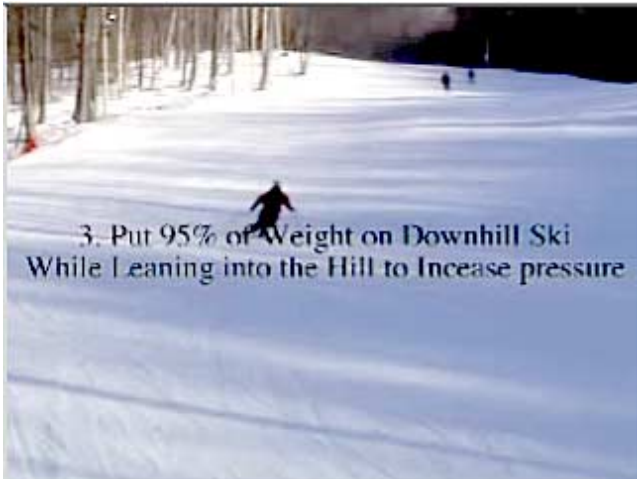


Figure 1. Screen shot of the GS turn video.

#### 3.2.2 Video: Voice-over

The yoga module used voice over to clearly describe each of the yoga poses.

#### 3.2.3 Video: Motivation

The economic model project had footage from a local grocery store that tied the economic model to everyday life.

#### 3.2.4 Video vs. Animation

The broomball module used both video and animation for a successful fast-break and two fast-break errors. The animation provides a clear view from above with clearly identifiable players that illustrate perfectly the concepts of a successful or unsuccessful fast-break. The video is shot from the stands and the players illustrate the concepts with some ambiguity of who is on which team and some superfluous movement, but it is more authentic and closer to what you actually see on the ice. Both were useful for teaching the content. It was interesting to see the techniques used together.



Figure 2. Screen shot of the fast-break video.

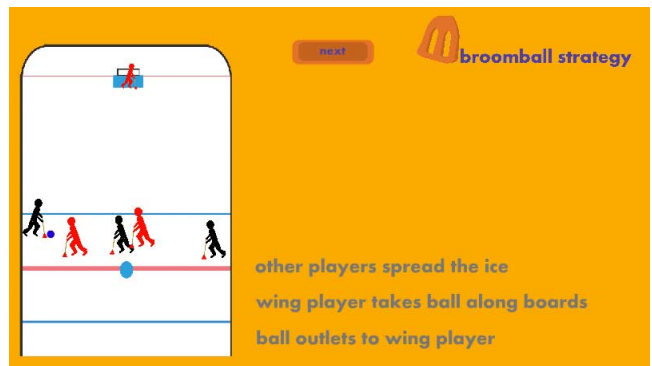


Figure 3. Screen shot of the fast-break animation.

#### 3.2.5 Animation: Motivation

The yoga module had an introductory Flash animation with promotional information about yoga and the back.

#### 3.2.6 Animation: Equations and Graphs

The economic model module included a Flash animation that linked each variable in the equation to the information about how it fits with the model. An animated graph further illustrated the relationships between the variables and how the model applies to real life.

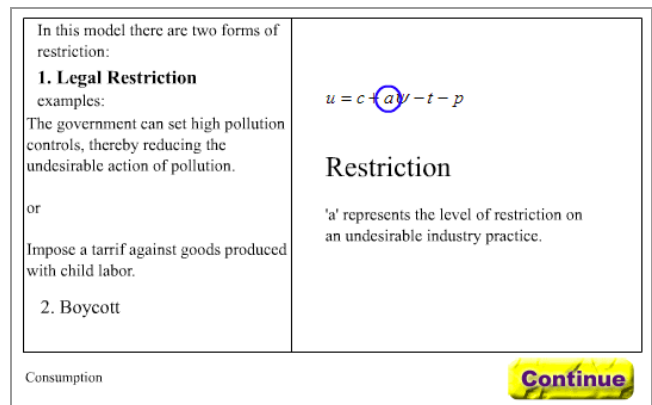


Figure 4. Screen shot of the animated equations.

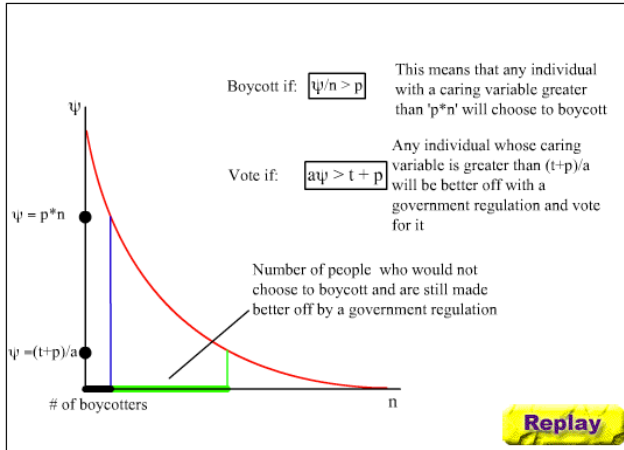


Figure 5. Screen shot of the animated graphs.

### 3.2.7 Animation: Motion Analysis

The golf module used stills captured from video and put them in successive order. For each consecutive image, vector graphics were overlaid on the image to illustrate spatial principles in golf.

### 3.2.8 Still images

The yoga module, in the interest of being accessible, had a collection of clear stills accompanied by text that lead the reader through yoga poses.

### 3.2.9 Audio

The slip jig module included music to dance to and audio of the counts to aid the dancer through the routine.

### 3.2.10 What's Missing from the Student Projects:

Gagne's Theory of Instruction has several parts. [5]

1. gaining attention – alert the learner to focus on desired features.
2. informing the learner of objective.
3. stimulating recall of prior learning, remind learner of prerequisite knowledge.
4. present the stimulus – activity or content.
5. learning guidance – cues or strategy for encoding.
6. elicit performance – practice.
7. provide feedback – corrective, to improve performance.
8. assess performance – demonstrate what has been learned.
9. Enhance retention and transfer – activities that go beyond the context of instruction.

Student projects lacked feedback and assessment. This is a significant omission for all of the projects.

The students found the strengths of the software applications and applied that to their goals for instruction. It is striking that the students would be able to find the balance between video, animation, text, still image, and audio and find ways to

incorporate materials creatively and successfully to illustrate a concept.

## 4. PROFESSIONAL DEVELOPMENT

Teaching the course was valuable professional development for the instructors. The instructors spent time in an electronic classroom using digital video cameras, tripods, video editing stations, electronic classroom podiums, and data projectors. The instructors learned from the students who rigorously tested their knowledge, and also enthusiastically investigated the most obscure functions of the software.

The experience was a good way to extend the instructors' knowledge of pedagogy, interact with students, and field test the lab computer image, software, and hardware.

The faculty were intrigued that the instructors were teaching a Winter Study course and genuinely interested in the content. The main outcome of teaching the course was the development of the instructors' hands-on classroom teaching experience. The instructors use this experience to discuss with faculty how they use technology in their teaching.

## 5. CONCLUSIONS/LESSONS LEARNED

### 5.1 Teaching

For Instructional Technology Specialists with other duties to perform, preparation for a two-hour class was time intensive, and four weeks was a short period of time to teach a full course. The instructors found that teaching the course was more intensive than teaching a series of two-hour workshops. Classes would often end before all student questions were answered and some students needed assistance with technology. Team-teaching was a great opportunity to distribute responsibility for course content and keep the class manageable. The course would have benefited from more student critique of work and more examples of instruction with multimedia. Grading papers was more difficult than the instructors anticipated.

### 5.2 Classroom Management

Having a firm attendance and grading policy is essential. The instructors thought their policy was clear, but students found exceptions to and holes in the policy.

### 5.3 Pedagogy

There are probably as many ways of teaching content to students as there are methods of reaching students. Technology opens up an opportunity to reach students in new ways and with a variety of media working together to illustrate concepts. Success in using technology in the classroom starts with the thoughtful implementation of a plan that combines the strengths of software precisely with the course content where there is likely to be the most benefit. Animation and video hold a great deal of promise as they become more accessible.

### 5.4 Projects

Students exceeded the expectations of the instructors. The creativity of the students revealed unexpected resources for teaching in software that the instructors thought they knew well. When the course is offered in the future, more of an effort will be made to have a greater diversity of project type.

## 5.5 Feedback

Students said that the course was valuable and that it was worth teaching again, and also, that they could have been pushed harder.

The ability to reference real classroom experiences makes a big difference when it comes to relating to faculty. Faculty did recognize and value our efforts in teaching the course. The students benefited from the course and thought it should continue to be offered. As Instructional Technology Specialists, the authors have certainly benefited from teaching the course and hope to continue to develop their classroom experience.

## 6. ACKNOWLEDGMENTS

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## 7. REFERENCES

- [1] Alessi, S. M. and Trollip, S.R. *Multimedia for Learning*. Allyn and Bacon. Needham Heights, MA, 2001, page 6.
- [2] Website. Multimedia Educational Resource for Learning and Online Teaching. <http://www.merlot.org/>.
- [3] Website. Library of Congress United States Copyright Office. <http://www.loc.gov/copyright/>.
- [4] Website. Nercomp Web Accessibility Links. <http://www.dartmouth.edu/~cc/principals/nercomp/index.html>.
- [5] Reiser, R.A. and Dempsey, J.V. *Instructional Design and Technology*. Merrill Prentice Hall, Upper Saddle River, NJ. 2002, page 65.