

## Before, During, and After Class – Online resources for students and faculty at Sir Sandford Fleming College

### Opportunity

Innovation in online learning is taking place across Sir Sandford Fleming College in Peterborough as professors initiate courses that are enhanced by, and offered entirely, through digital media. As the College works to develop a broader digital learning strategy, faculty, in cooperation with the Centre for Learning and Teaching, seek to enhance student learning, access, and experience through the introduction of online learning.



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### Innovation

The diversity of digital resources available include learning materials to prepare students for work in the laboratory, a course in classroom management for college faculty, web-based demonstrations for after class learning, and software and technology that allow presenter mobility and interaction.

The first example looks at digital resources designed to be used before class, to prepare students for more effective learning:

**The Flipped Classroom:** Blair Brown, Program Co-ordinator for the Computer Security and Investigations Program, teaches a course in Internet Investigations. The course had been offered as a one hour lecture and two hour lab; his design was to flip the classroom so that the students work online prior to the lab sessions and are then able to move more quickly and creatively through the tools and assignments. Rather than presenting a lecture, he offers online modules in 10-15 minute segments that set the context with learning materials, experiments, and assignments for independent research. A detailed menu for the slides linked to audio is provided so that the students can pinpoint the exact information they need. Each online module outlines the specific skills to be covered and what the students need to know - and be able to do - prior to the weekly lab session. The

modules are offered outside of the learning management system in various formats – Windows, Flash, MP3 – for easier and more flexible access.

The second example describes an online course offered to college professors:

Classroom Management: Faculty Cyber Connections is a network designed for college faculty wishing to advance their teaching practice through online collaboration with colleagues in the six colleges in Eastern Ontario – Algonquin, Durham, Fleming, La Cité, Loyalist, and St Lawrence. Nine practical, interactive online modules, each of which can be completed in 6 to 8 hours, are offered. The modules share a common design, integrating overviews, content, activity, discussion boards, and surveys. Terri Geerinck, Instructor in the Classroom Management module, incorporates currently available videos featuring classroom management challenges. As part of the course, participants pick a particular problem student in the video and a strategy to respond to behavioural issues; outcome and interviews with students and experts on choices and options are then shown. After navigating through their chosen vignette, the course participants prepare a mandatory posting to the discussion board on one student and one strategy. The instructor responds to each major posting and the participants also comment on each other's contributions. Other posted discussions in this module centre on current classroom management issues and how to more adequately prepare classes for engaged learning. Participants collaborate to discuss possible techniques to manage issues and come up with a variety of solutions and alternatives. The participants are graded on their contributions and receive a certificate of completion.

The final two applications provided digital materials for use after class and laboratory sessions:

Web Demos: Josh Felthan, Professor in the Ecosystem Management Program, teaches a data management course in which students use information technologies to manipulate data from a variety of disciplines within the School of Environmental and Natural Resource Sciences. The program co-ordinators want all of the students, a mix of mature students and recent secondary school graduates with greatly differing technological capacities, to have more experience with data management. To facilitate this, Professor Felthan has created web videos for the students to work through after class, using Flash videos and audio. Over 14 weeks of class, more than 60 demonstrations of 2 to 5 minutes each are made available.

Introductory Computing: All 1,600 first semester students at Fleming College are required to take a course in Introductory Computing, which covers basic terminology, e-mail, file management, word processing, presentation software, and spreadsheets so that they can make productive use of computers for learning and in the workplace. The students attend

labs and are given paper-based reference materials. At the end of each week, web modules are released for student review and practice. The modules are divided into 2 ½ minute segments so students can pinpoint their areas of need.

## Outcomes and Benefits

The Flipped Classroom: In a focus group held after course completion, students responded very positively to the new structure of the Internet Investigations course. As they are technologically savvy, they were able to use the resources successfully for anytime, anywhere learning, especially with the choice of formats offered. The menus were appreciated for pinpointing information for lab preparation and for later review. The students felt well prepared for more effective learning in the lab and would be very willing to use online learning in the future. Professor Brown found that the level of lab preparation of the online students was much higher than that in previous classroom-based courses.

Due to the amount of work involved in preparing the materials, it is best to choose a course with relatively stable content for conversion to online. Given the success of the model, Professor Brown has developed online resources to provide students with extra help with the course material, integrating videos to answer commonly asked questions.

Classroom Management: The college faculty have found the online learning to be well-targeted to their learning needs, with immediately applicable skills and knowledge. The Classroom Management students were particularly appreciative of the instructor's involvement and modelling of online classroom management techniques – useful for online and in-class application. By sharing the development and provision of the modules, the six Eastern Ontario colleges reduce duplication of effort, share costs, and provide opportunities for the recognition and showcasing of expertise in the various institutions. The collaborative, interactive learning environment creates an online community of practice that can endure long after course completion.

Web Demos: The students who were not comfortable with using technology for data management were particularly appreciative of the chance to work through the materials at their own pace or with the help of student support workers in the Learning Commons. Having students refer to the web demos also lessened the teaching and coaching load for the professor. As the content of the data management course does not change extensively from year to year, the materials can be re-used for successive classes.

Introductory Computing: The web modules are available throughout the semester for review and just-in-time learning; students who tested out of the course can also access them for specific learning needs. The modules have been made more widely available by

putting them in a wiki, rather than restricting them to the learning management system. Students in all programs can use them for specific skill learning.

## Challenges and Enhancements

The Flipped Classroom: Professor Brown, despite being very familiar with computers, found the development process for the online materials to be lengthy – often more than 2 hours for a 10 minute segment. He had to create a multi-track development process, producing the parts separately. This advanced use of technology requires high-end support and technological infrastructure. The issue of intellectual property rights is difficult for a course developed completely on a professor's own time and resources. Copyright regulations and permissions also create challenges, such as the inclusion of Facebook and Twitter logos in the course modules.

Classroom Management: Leading the course was demanding as the instructor was very active in the discussions, offering considerable support and positive reinforcement. Online classroom management skills were needed to ensure online etiquette was maintained.

Web Demos: The preparation of the materials required considerable time and expertise, especially for the editing process.

Introductory Computing: The web materials are most useful when used with the paper-based materials as the exercises and explanations are built around the paper resources.

## Potential

The Flipped Classroom: The development of the online resources for the course requires a new way of thinking about teaching, learning, and presentation of information. Designing in modules with multiple resource choices is exhilarating and demanding, offering enormous potential for application to other courses. Considerable support is necessary, including release time, training, infrastructure, clarity on intellectual property rights, and support with copyright regulations and clearances to ensure that the best possible online resources are created.

Classroom Management: A manual is being prepared to guide the preparation of new modules, integrating best practices for online learning.

Web Demos: The information and skills in the web demos are useful beyond the class for which they were prepared and could be offered more broadly as reference tools for

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student learning. The timing of their use could also be moved to prior to the lab sessions for preparation rather than review, which could make the time in the labs more effective for learning.

Introductory Computing: Andrew Bohart, who designed and teaches the introductory computing course, has been adding mobility to his seminar presentations through virtual network computing, a desktop sharing system that allows remote control of another computer connected to a projector so that a presenter can change slides from anywhere in the room. He is also working with a Tablet PC and Classroom Presenter 3 Program, both of which allow him to write directly on Word documents and PowerPoint slides while moving around the room during presentations.

The professors, as well as the staff in the Centre for Learning and Teaching, are very open to talking about their digital learning innovations with colleagues in other post-secondary institutions in Ontario and exchanging ideas on the enhancement of student learning. Also of interest is how colleges can best support staff developing online and hybrid learning courses and resources.

## For Further Information

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