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**Actively Engaging Students in Learning Information Networking
Systems and Security**

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Course Development Grant (Spring 2007):

**Actively Engaging Students in Learning Information Networking Systems and
Security**

PURPOSE:

The course development grant was used to redesign a required MBA information networking systems and Security course with active learning. With the recent change in the information-networking field toward a more security and assurance approach, it was vital to integrate new *teaching strategies, activities* and *hands-on labs skills* into Info648 a traditionally lecture-based, none-lab course. The “actively engaging students in the learning process” workshop with Dr. Donald Mass TRC brought to campus during the winter break of 2006 served perfectly as the guidelines for this course redesign. The course redesign project used an integrated collaborative and cooperative approach which involved redesigning syllabus, course activities and hands-on labs to actively engaging students in the learning process and evaluation rubrics to make sure the newly designed procedures would help students learn more effectively.

IMPLEMENTATION TIMELINE:

The newly developed course was implemented in Fall, 2007 in Info648 - **Information Networking Systems and Security**.

PROJECT DESCRIPTIONS:

Info648 is a concentration course for information management majors in the CBPA MBA program. The major goal of this course includes advanced study of developing, implementing, securing and managing information networks. Topics include use of hardware, software, routers, wireless communications, and Voice over IP. Management issues such as access control, privacy, protocol, security and policies are also explored.

However, because of the diversified student groups (some were INFO majors from their undergraduate programs; some were not), the course was mostly lecture-based. Hand-on work on actively managing networks became hindered with diversified levels of networking competency. Students took notes from lectures and reviewed books. Projects were mostly research-based analysis.

Participating in a winter teaching seminar by *Dr. Donald Mass (TRC sponsored)*, I saw possibilities in changing ways this class could be taught: Using cooperative and collaborative learning to actively engaging students in the learning process, the dilemma of students’ different entry-level competency on networking could be solved by paring, cooperation and active engagement. In consultation with the department chair, Dr. Stewart and some colleagues, I proposed to expand the current course to include **cooperative and active learning** in Info648 starting fall of 2007.

PROJECT IMPLEMENTATION:

I followed the following stages for the project implementation:

1. Project Preparation (March 2007 through Summer 2007):

- a. Material Preparation:

- i. Computer workstations were setup for lab preparations using virtual PCs in Windows and Parallels in Mac
 - ii. Install and test screen capture program which was needed for lab demonstrations
 - iii. Lab testing
 - b. Course Material Design and Development:
 - i. Syllabus reconstruction
 - ii. Lab requirements and sample lab creation
 - iii. Business Network evaluation project redesign Requirements

2. Course Implementation in Fall 2007 (Info648 is taught only once during Fall):

- a. Lectures: 1) Two students team up for presentation of at least two course topics, e.g. wireless networks, information security; 2) Instructor led discussion related to presented topic each session
- b. Lab Activities (Guided as well as requirements based)
- c. Virtual collaboration of a case study (Using Google Documents)
- d. Team project – Business network evaluation and redesign

3. Evaluation of Course Effectiveness:

The evaluation of the redesigned course effectiveness is based on a combination of active learning benefits again four key course modules.

- Active Learning Benefits
 - a. Motivation vs. memorization
 - b. Simulation of experience
 - c. N-way Interaction
 - d. Linking classroom to business
- Four Key Course Modules:
 - a. Interactive lectures
 - b. Lab Exploration
 - c. Virtual Collaboration
 - d. Team Projects

Results Of The Projects:

Two distinctive gradable results were 1) interactive presentation of lab process and results – Video podcasts; 2) quality network evaluation and design projects that students could use in their MBA portfolio to show case their learning.

To evaluate the effectiveness of the redesigned course, I created a simple questionnaire with the following 5 questions (14 total students in class, scale 1 to 5 with 5 for greatest)

1. Rate your experience on virtual collaboration (*Mean = 4.43*)
2. Rate your experience on cooperative lab assignments (*Mean = 4.71*)

3. Rate your experience on Collaborative network evaluation and design project (*Mean = 4.79*)
4. Rate your total learning experience in this class (*Mean = 4.64*)

Verbal Comments from Students:

“I had very limited networking experience or knowledge before this class. The hands-on learning was very helpful in this class. I could not only learning from the instructor, but also my team member who happened to have more experience than I did. We were so amazed by the tools we used to record our lab process and to present the results in a podcast format.”

“I was an young IT manager. I came to the class to enhance my experience, not to watch to Powerpoint slides. Dr. Zhu’s integrative learning approached helped with that.”

Lessons Learned:

In the report of a 2004 TRC Summer Course Design and Development grant, I wrote:

“Even though a course model redesign helps students’ learning of that module, it is better to redesign all modules of that course so that students can experience the systematic changes. In a quarter system, a module only involves one to, mostly 3 weeks of work, if students are required to do things in one way in one module in other ways in other course modules, it is hard for them to adapt to such changes”

The current course redesign is an extension of this previous grant. Besides the original hands-on approach, this class incorporated collaborative and cooperative components in class material presentation, virtual teamwork, and a comprehensive team project. The class “create(s) experience that stimulate or match reality” (Silberman, 2006).

One lesson learned was that we, as university teachers, couldn’t ignore the power of learning tools. We need to select the right information tools for the classes we teach.

My future plans for course redesign and development are to use information tools to enhance teaching.

I plan to present the fully analyzed results at the TRC poster session in September 2008.

References:

Silberman, M. (2006). Teaching actively: Eight steps and 32 strategies to spark learning in any classroom. Boston: Pearson/A&B.

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