USING Elluminate Live TO ASSIST DISTANCE LEARNING OF INFORMATION ASSURANCE CAPSTONE SEMINAR

Keyu Jiang, Ph.D., Fort Hays State University, 600 Park Street, Hays, KS 67601, 785-628-4684, kjiang@fhsu.edu

Xiaohong Yuan, Ph.D., North Carolina A&T State University, Greensboro, NC 27411, 336-334-7245 x464, xhyuan@ncat.edu

Hongbiao Zeng, Ph.D., Fort Hays State University, 600 Park Street, Hays, KS 67601, 785-628-5811, hzeng@fhsu.edu

ABSTRACT

The development of distance learning course of information assurance capstone seminar has fostered a revolution in the manner we communicate between/among teacher and students, and in fair evaluation. This paper describes the limitation of traditional on-line teaching management system and the improvement by introducing Elluminate Live to the teaching of an information assurance capstone seminar through distance learning which demonstrate the students’ ability of meeting at least three subcategory level standards of NSTISSI No. 4011 at the performance level.

INTRODUCTION

INT 891 Capstone Seminar in Information Assurance is a culminating course that studies Information Assurance (IA) through the use of case studies, research, and knowledge application for master’s degree seeking students. In this course students conclude their graduate studies with a project they have designed to demonstrate their academic achievements and enhance their IA capability from the awareness level to the performance level as defined in NSTISS 4011 [1]. Students work very closely with their advisor/instructor on a significant project that will serve as the master’s degree level culminating experience [2]. This course is delivered online through the Blackboard Learning Management, which provides a flexible way of long distance learning for the students. Students can choose their topic of interest to study within the structure of the class. Different students may study different topics at the same time. This makes the individual one-on-one teaching and research advisement necessary.

GRADUATE IA PROGRAM COURSE ALIGNMENT

All teaching approaches in the IA program are aimed toward one final goal: motivating students to reach the IA Performance Level. The NSTISSI dictates that Performance Level training “provides the employee with the skill or ability to design, execute, or evaluate agency INFOSEC security procedures and practices.” IA Performance Capability refers to “Playing the role of either a system penetrator or a system protector. The student will discover points of exploitation and apply
appropriate countermeasures in an instructor-supplied description of an Agency
AIS/telecommunications system [3].”

To develop IA Performance Capability, INT 891 Capstone Seminar in
Information Assurance is taught in four stages as listed in Table 1.

<table>
<thead>
<tr>
<th>#</th>
<th>Stage</th>
<th>Content</th>
<th>Requirement</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation (three weeks)</td>
<td>Choose material; Read &amp; study material; Unit Test</td>
<td></td>
<td>30%</td>
</tr>
<tr>
<td>2</td>
<td>Project Proposal</td>
<td>Scenario definition; Write literature review; Project plan or design</td>
<td>Cover at least three sub-categories at performance level of NSTISSI 4011; Easy Identification, Questions addressed, Effectiveness, Cost efficiency Pre-approved by advisor</td>
<td>25%</td>
</tr>
<tr>
<td>3</td>
<td>Project implementation (over 40 hours)</td>
<td>Conduct research Complete report; Compose paper</td>
<td>Research reports need to be between 25 and 150 pages in length in APA style. Design, implementation, result, and evaluation will stratify with three to four criteria of performance level standards of NSTISS 4011</td>
<td>35%</td>
</tr>
<tr>
<td>4</td>
<td>Project review</td>
<td>Presentation; Defense</td>
<td>Meet at least three subcategory level standards of NSTISSI No. 4011 at the performance level</td>
<td>10%</td>
</tr>
</tbody>
</table>

**LIMITATION OF THE TRADITIONAL ON-LINE LEARNING MANAGEMENT SYSTEM**

We adopt Blackboard Learning System to manage the on-line course to deliver the long distance teaching. Blackboard Learning System is a web based course management system. It provides access to the courseware for students through Internet.

Thanks to the Blackboard teaching system, each student can select any six chapters from the textbook during the preparation stage. If the students have
confidence in grasping the essentials, they could start to take part in the online Keyboard-and-Screen tests for the selected areas or chapters at their earliest convenient time. One limitation of the current online teaching system is that we cannot find out if the students were cheating during the online test.

We strongly encourage active student involvements in curriculum activities, which are important for generating good results. Based on our observations, students are most involved when they act in a group with competition and peer-evaluation. Another limitation of the current online teaching system is that we cannot initiate presentation/ small group presentation, small group discussion, technical competition, or role playing to fully motivate the students, or allow the students to demonstrate their ability during project implementation and review stage.

Flexibility is the most significant advantage of online learning; however, it also requires a great degree of self-discipline of the students. We found that some students may delay or give up the whole study process if they fail to brainstorm a feasible project proposal or communicate with the teacher. This often happens when they are incapable of identifying complicate problems, differentiating risks, creating efficient countermeasures and applying solutions. The third limitation of current online teaching system is that traditional ways of communication such as online message, email, and telephone is not sufficient. Stronger communication mechanisms are needed. Tools that not only help to realize additional initial guidance of courseware, but also establish closely simultaneous relationship between the teacher and the students are needed.

During review stage, an on-campus student will give a 45 minutes final presentation 45 minutes to his committee and will be questioned for about 30 minutes face-to-face for an open-door defense. For a distance learning student, presentations can only be done through email with the mixture of PowerPoint and text document, voice over PowerPoint, Streaming Video, Interactive Video and/or conference call. The teachers or committee members can only challenge the student through telephone conference or email. However, in our capstone project, we must create and maximize the use of technology to make sure that students with different background meet at least three subcategory level standards of NSTISSI No. 4011 at the performance level. This is a challenge to the current online teaching system.

Given the current trend of providing IA education online, many researchers have started to develop “virtual lab” to support their IA courses remotely [4, 5]. Another major limitation of current IA courses online teaching system should be fail to share vision demonstration of the security laboratory infrastructure, which supports security course offerings during project implementation and review stage.

**IMPROVEMENT BY INTRODUCING ELLUMINATE LIVE**

Elluminate Live is “a real-time virtual classroom environment designed for distance education and collaboration in academic institutions and corporate training” (Wikipedia, 2008). Elluminate Live fosters a slogan called “No user left behind”, which means people are able to access Elluminate Live easily if they use any of the major operating systems, such as MS Windows, Mac, Linux, and Solaris.
We are using Elluminate Live to assist the teaching of IA capstone seminar with Blackboard Learning System during the preparation stage, proposal stage, implementation stage, and review stage as listed Table 2.

Table 2. Usage of Elluminate Live

We could not have virtual group discussing utilizing Blackboard system though there is on-line forum called "discussion board". However Elluminate Live can solve the problem. Using Elluminate, students can be divided into several groups within their own Breakout Rooms, and switch out their students among different groups. The function of each Breakout Room is like the Main Room. Students are able to use Whiteboard too. However, a student can only hear the voice spoken by those participants who belong to the group. Each group classroom is independent with its game rule, such as peer-evolution mode, voting mode and statistic method. Elluminate Live provides a scenario that is very similar to an on-campus classroom to carry out small group activity, i.e. small group presentation, small group discussion, group meeting or technical competition. Instructors can just monitor the discussion of all Breakout Rooms, or join in any of the Breakout Rooms to participate in the group discussion, or help any students from any Breakout Rooms if they have questions. It allows a number of participants (students and faculties) to interact with each other in real-time. A faculty or a meeting chairman is able to monitor and administrate the entire progress.

Elluminate Live helps users develop much richer content of learning and teaching. Importing PowerPoint, recording voice, transferring files, playing multipoint video, surfing web tour, using graphic calculator, and displaying math symbol are all supported by Elluminate Live. The most useful function is the communication and multimedia application. If you are MSN user, you will be familiar with the chatting function, which can send text message, video and audio message. The difference from instant communication software is that Elluminate Live can play multimedia
applications, such as Webpage, MPEG, MPEG4, QuickTime, Flash, PowerPoint, Word, and Excel at the same time. For example, a distance learning student will be responsible for scheduling his/her committee exactly his/her on-campus classmates and he/she will present the completed project to his/her committee and defend “face-to-face”. They can exhaust their resources to demonstrate their mastery of entry level of Performance Level of NSTISS 4011 based upon the type of project. This helps the committee members not to get lost in the presentation; the committee members do not have to flip over papers to look for a specific point in the paper. The committee members can also ask questions by audio chat, and the students are able to respond to those questions by speaking though the microphone. Committee members may use the Whiteboard to point out the places where they would like the students to explain. At the end of the process, the committee members could be moved into a Private Breakout Room to discuss and vote for the results. The results may be posted on the Whiteboard in the Main Rooms, or be announced by voice to the students.

Therefore, it is important for instructors to consider the use of the virtual system to address the issues carried from within the traditional classroom or in the context of virtual space in near future. For example, “Test Administrator” can create small stimulation tests to help students to understand formal test content and depth. The time could be set and the score could be finalized in a minute. If a student turns on webcam and selects the button of “Live Broadcast” and “Course Record”, we can automatically record the whole process of his on-line test. This function is aimed to prevent cheating. It also can make sure that each passer should understand key concepts of the awareness level. This will help to find students’ aptitude and interests, laying a solid foundation for carrying out research later in the learning process. Another function, “Sharing application” allows sharing entire desktop or specified application through long distance. We can select several computers at security laboratory connected to internet to share laboratory infrastructure to long distance learning student. In the future, we may open a server to long distance student to fulfill the dream of “virtual lab”. Those changes will encourage long distance learning students to fully use on-campus resource to increase their IA performance competence.

CONCLUSION

We have presented our hands-on teaching experience of INT 891 Capstone Seminar in Information Assurance, and compared different teaching systems we used. Elluminate Live affects the distance learning experience, especially in the IA Capstone Seminar. Our experience should help IA educators in implementing on-line IA courses and in bringing more interesting and informative learning environment to the students. We will continue to assess the effectiveness of our approach through a longitudinal study.

REFERENCES
1. Jiang, K. and Bannister, M., Enhancing IA Performance Capability through an


