STUDENT CREATED ~ STUDENT EDITED
ONLINE COURSE MATERIALS: TEACHING APPROACH FOR AN ADVANCED TECHNICAL COURSE

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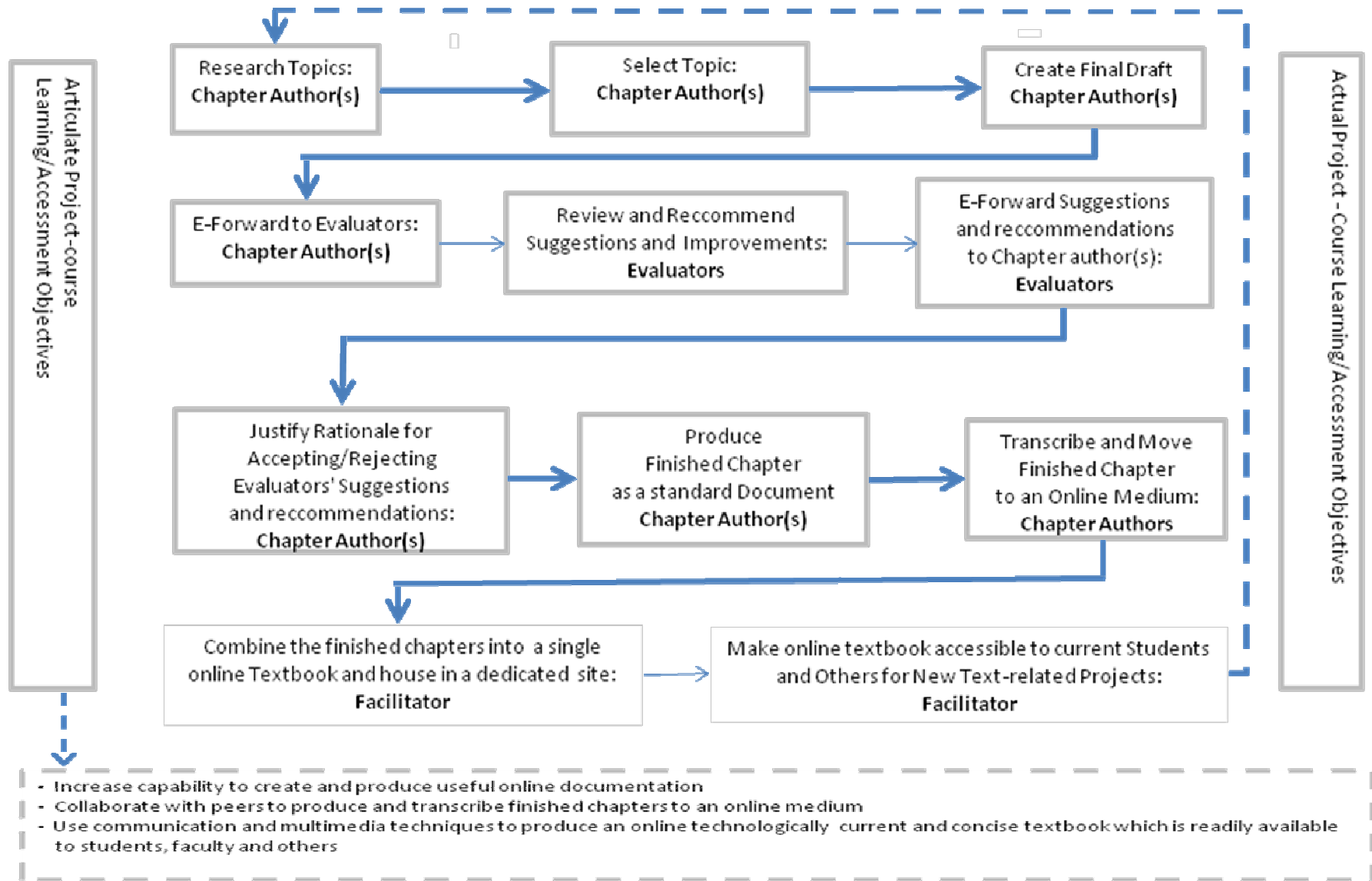Northern Illinois University
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ABSTRACT

This paper presents a project design that has been used at a Midwest College with upper-level undergraduate and graduate students for eight semesters. This project incorporates a collaborative learning model that addresses limitations often found in teaching technical courses. The collaborative learning model engages the student more actively in the learning process by enabling them as the topic researcher and paper editor, which is not the case in traditional classes. The students produce relevant course-related content that is evaluated and improved using an easily accessible online medium available to class members and faculty. The papers or chapters are then presented using an online book format which includes two navigation techniques. The benefits of this project design are also discussed in this paper.

INTRODUCTION

Traditionally, students in upper-level Management Information Systems (MIS) and other Business courses are frequently assigned long term papers on topics pertinent to the class in which they are enrolled. However, producing current topical information for technical topics in MIS courses suffers from two major limitations: technical issues are inherently complex and technical advances can result in rapid degradation of topical currency. The rapid pace of technological and research advances, along with the proliferation of information about those advances, presents an ever-increasing challenge for students who seek to learn current developments and technology in the MIS field. In addition, educators are continually challenged to incorporate leading-edge content to their courses (Carver, 2005). To ensure incorporating current technical topics in an upper-level MIS course, we present a collaborative learning model that immerses the students in the learning process. The model presented in Figure 1 shows the flow of the project described in this paper.

Under this model, a student selects multiple possible topics and with the assistance of the instructor (facilitator) selects a particular topic to research and develop a paper or chapter. The student researches and develops the chapter over approximately 4 weeks.

Figure 1: Collaborative Learning Model for Online Content

Articulate Project-course Learning/Assessment Objectives

Actual Project - Course Learning/Assessment Objectives

Research Topics:
Chapter Author(s)

Select Topic:
Chapter Author(s)

Create Final Draft
Chapter Author(s)

E-Forward to Evaluators:
Chapter Author(s)

Review and Reccommend
Suggestions and Improvements:
Evaluators

E-Forward Suggestions
and reccommendations
to Chapter author(s):
Evaluators

Justify Rationale for
Accepting/Rejecting
Evaluators' Suggestions
and reccommendations:
Chapter Author(s)

Produce
Finished Chapter
as a standard Document
Chapter Author(s)

Transcribe and Move
Finished Chapter
to an Online Medium:
Chapter Authors

Combine the finished chapters into a single
online Textbook and house in a dedicated site:
Facilitator

Make online textbook accessible to current Students
and Others for New Text-related Projects:
Facilitator

- Increase capability to create and produce useful online documentation
- Collaborate with peers to produce and transcribe finished chapters to an online medium
- Use communication and multimedia techniques to produce an online technologically current and concise textbook which is readily available
  to students, faculty and others

After the chapter is completed, the student submits it to his peers, other group members, who will evaluate the chapter and make recommendations on ways to improve the chapter. The evaluators will provide their recommendations online to the author. They have two weeks to evaluate the papers of their group members and upload those evaluations so the author can access them. The author will then revise the paper based on those recommendations to produce the final draft of the paper. The author has one week to revise the paper. The author then translates the chapter into an online document that includes multiple navigation tools, graphics, hyperlinks and other online features that make the chapter an online experience instead of a set of pages on a topic. They have three weeks to create an online document using the templates provided or other tools. The course instructor, acting as a facilitator, will help combine all finished chapters created by the students into an online textbook once these chapters approved and graded by the instructor. These chapters would be housed in a dedicated Web server available to all classes in the department.

THE PROJECT

The project was proposed to have students develop in depth papers on relevant technical topics that when completed would be accessible in a useful online format for their peers and others. While creating these materials the students would increase their learning by collaborating to improve the materials. A semester long Business Computing Environment course taught in the Fall of 2005 at a large mid-western university was the first class to do this project which uses the Collaborative Learning Model for Online Content (CLMOC) as shown in Figure 1. In essence, they developed online course materials that were combined as chapters into an online book for the class. This technique has been replicated at least once per every semester including Spring 2010. The size of these classes ranged from 10 to 36. The CLMOC was designed in such a way that each student in the class:

- Researched a topic pertinent to the class or subject.
- Developed a complete paper (chapter) on the topic.
- Evaluated and made recommendations for the papers of two or more of his/her peers.
- Revised/improved their paper based on their peers' evaluations and included a justification for each change they did or did not make.
- Transformed final course material (chapter) written in Word format into an easily used online format.

Figure 2A: Selected Topics OMIS649 Fall 2005

Figure 2B: Selected Topics OMIS649 Spring 2008

Figures 2A and 2B present the selected and approved topics for two different classes. Figure 3 shows an example of an online textbook chapter produced using a set of templates available to the students during the project. The book chapters developed over previous semesters were made available online to all students in the class as well as others outside the class. Considering the fact that technical information and materials become dated, future students who take this class could be given the options to either create a new chapter (new topic) or modify a previously-created chapter, thereby increasing the breadth and depth of topics covered in the online course materials as well as to assure content currency for the selected topics.

Figure 3: An Example of Online Book Chapter

THE APPROACH

TOPIC SELECTION AND GROUP ASSIGNMENT

There are two common ways to have students select topics. In the first approach, students are given a list of pertinent topics from which to select. After validating to ensure that the topic is unique (i.e., that it has not been selected by anyone else), the instructor then assigns a topic to each student. Some coordination works are needed to avoid selecting the same topic. In the second method, students are first given a list of pertinent topics from which to select. Each student is then asked to submit to the instructor (facilitator) a list of four topics in most-to-least preferred order. Next, the instructor would delegate a topic from the list to that student or ask the student to suggest other topics. In this way, the instructor can assure that a wide array of topics is covered and can avoid the possibility of duplications. The second method was used in this project since the class was relatively large with a range of 18 to 24 students each semester. The instructor then arranged the students into groups of three so that the each student author would receive recommendations and evaluations from two peers for the selected topic on a book chapter.

THE PROJECT

The following two questions motivated this project design: Could you ask your students to write papers on relevant technical topics that when completed would be available in a useful online format for your class? How can students collaborate with each other and the instructor on writing, in essence, an online textbook in such a way that this process will maximize student learning, give access to important material to the whole class and others and maintain technical currency for those materials? A semester long Computing Environment course taught in the spring of 2008 at a large mid-western university was used for the project to address the above questions. In essence, writing online book chapters, sections, or papers can be done with relative ease in most upper-level classes. The project is designed in such a way that each student in the class:

- Researches a topic pertinent to the class or subject.
- Develops and produces a complete paper (chapter) on the topic.
- Evaluates the papers of one or more of his/her peers.
- Revise/improve their papers based on the instructor and peers' evaluations and include justification as to why they are making the changes.
- Submit the final paper (chapter) as an online document.

Figure 4: Selected Topics for the Computing Environment Class

Figure 4 presents the selected and approved topics for the class discussed in this project. Figure 3 shows an example of an online textbook chapter produced in this manner during the project. The book chapters were online and made available to all students in the class as well as others outside the class. Considering the fact that technical information and materials become dated, future students who take this class could be given the options to either create a new chapter (new topic) or modify a previously-created chapter, thereby increasing the breadth and depth of topics covered in the online book as well as to assure content currency for the selected topics

THE APPROACH

TOPIC SELECTION AND GROUP ASSIGNMENT

There are many different ways to select topics. Over the last five years that that we have implemented the Collaborative Learning Model for online content the following process has been used. We start talking about topic selection in the second week of the semester, we go to the web and show how to access the books developed by previous classes. It is suggested that the students go through and look at several of the chapters from different classes to give them ideas about some possible topics. In about the fifth week the students are asked to create a list of four topics they would like to research. They are asked to put them in order of preference where one is the preferred topic and four is the least preferred. The instructor (facilitator) using each student's preference list selects a topic for each student such that a wide selection of topics is covered and minimal duplications occur. At times the facilitator may need to ask a student to suggest additional topics since all topics have already been used.

The facilitator then has the students break into groups of three or four. These Groups will then be used for paper (course-material) evaluation. In this way each student will receive recommendations from at least two peers for their book chapter (course material).

DEVELOP ONLINE BOOK CHAPTERS

Each student researches the topic by collecting information and developing the paper during this stage. The paper or the book chapter should be fifteen to twenty pages in length and double-spaced. Each paper should have a minimum of seven references (ideally more) including at least two book references. Once the student finishes the paper, he/she uploads it to their web presence where the editor/reviewers can access the chapter.

PEER EVALUATION AND RECOMMENDATION

All students are given a rubric to use in evaluating a chapter. They are also given a sample chapter that has already been evaluated using the rubric and shows the types of recommendations that should be made. Each group member downloads the papers for all other group members and goes through the evaluative process to make recommendations for improvement of each chapter. These editing suggestions can include, but are not limited to, reevaluating who the audience is, suggestions about writing more clearly for the audience, rephrasing sections of the document that were not completely understood, adding more pertinent information to the paper, improving the flow between sections, correcting references, etc. Each student makes use of the track changes feature in Microsoft Word to notate suggestions and recommendations. Once their evaluations were completed, student-editors upload the apers including their recommendations to their web presence so that the chapter's author could easily access and download them.

DEVELOPING BOOK CHAPTER MODIFICATION AND IMPROVEMENT

Based on these recommendations from their peers, the author of a chapter (course-material) would reevaluate the paper and create two submissions for the final draft: One submission would show the recommendations of the evaluators with the author's rationale for incorporating or not incorporating the given recommendations; The other submission is a "clean" version with all the agreed upon modifications incorporated, absent the editorial/comment markings.

CREATING THE ONLINE VERSION OF THE CHAPTER AND PRESENTATION

Once the paper is complete, it is ready to be translated into a useful and visually appealing online document as shown in Figure 3. Since the qualities of an online document differ from a hard-copy (print medium), the document needs to be segmented into component units which fit approximately on a screen. It is also important to allow the reader to access different parts of the chapter easily within the course-material (chapter). Operationally, each screen could incorporate definitions as pop-ups driven by using a mouse-over feature, links to references could open in new windows, and graphics could be displayed with the data or in a new window with a link from the text. A page/screen turner mechanism and a menu to access different sections within the chapter would also be necessary elements of the online version construction (Campbell, 2003; Lu, Yu, and Liu, 2003).

Since some students may be unfamiliar with inserting graphics in specific positions on the screen or making data appear at the right locations on the screen, the facilitator instructed on the use of Microsoft Word and Microsoft Expression Web to organize the information in an online format. Figure 5 shows how a student can access a set of three templates that can be used to create the screens, then menu and the

page-turner. These can be used to organize the chapter for web delivery. The templates include a frames template, a menu template and a page template. The students normally use the templates to create their chapter for web delivery.
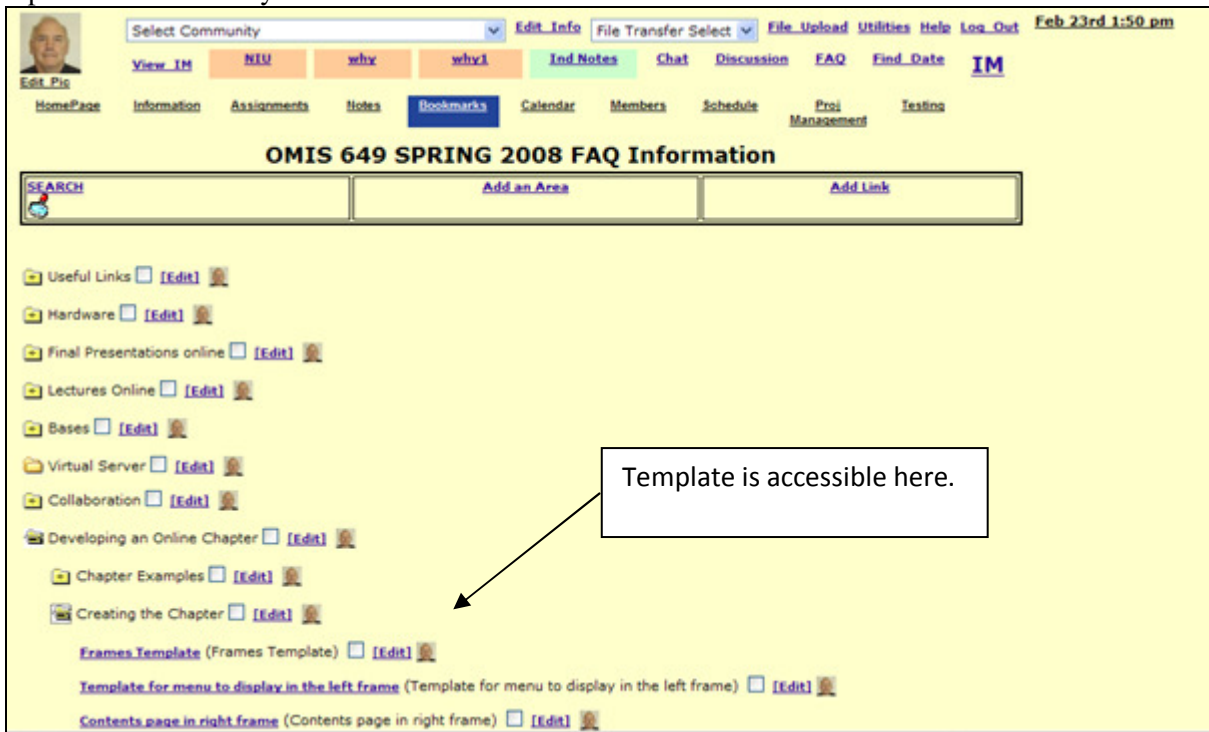

Figure 5: Organizing the chapter for Web delivery Using a Frame Template

CONCLUSION

This paper presents a collaborative learning model that has been used for five years to allow students to produce useful course-materials that are evaluated, improved, and presented in an easily accessible Internet medium available to the class, faculty, and others. This type of learner-facilitator initiative produces a number of benefits. For example, the students benefit from this process because they are able to:

- Learn how to better display material in an online environment.
- Improve their own writing styles by having to evaluate and make recommendations about two or more book chapters developed by other students
- Hone their writing styles by incorporating suggestions and recommendations on improving their chapters.
- Broaden their depth of understanding on topics since they developed one topic and had to review at least two other chapters.
- Verify that their paper has correct references using Safeassign (Blackboard 2009)
- Access more topical information for the class or subject easily by going online and looking at the materials of previous classes.
- Research a topic pertinent to the class or subject.

Similarly, course facilitators can benefit from this undertaking because they are able to:

- Partner with students to provide useful and timely information written by and for students.
- Make an abundance of topical information accessible to virtually every student (as well as those not in the class).
- Cover more material in the course.
- Keep information current with less effort.

In summary, the student response to developing and making use of online course materials has been very positive. In addition the facilitators have benefited from having a greater breadth of materials available which are topically current. This is a "win-win" solution. The faculty expands the amount and quality of materials available online in a readily accessible format. The student is able to gain insight into at least three topics. The one he/she developed and the two or more topics that he/she evaluated. In addition many students commented that "evaluating others papers" allowed them to improve their own writing skills. That is why we have continued to use the collaborative learning model for online content for the past five years.

Interested readers can go to http://omis5.omis.niu.edu/OnlineTemplate to download the templates used to allow students to easily put their course materials (chapters) in an online format. Anyone wishing to implement this type of project or wanting to find out more should contact the authors at bmackie@niu.edu or cliu@niu.edu.

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