ONLINE TEXTBOOK COLLABORATION:
STUDENT-AUTHORED ~ INSTRUCTOR-FACILITATED

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ABSTRACT

This paper presents a project design, which addresses the limitations often found in producing technical literature and provides a model that engages the student in the learning process in a more meaningful way than traditionally has been the case. The student produces useful information that is evaluated, improved and displayed in an easily accessible online medium available to class members, faculty and others.
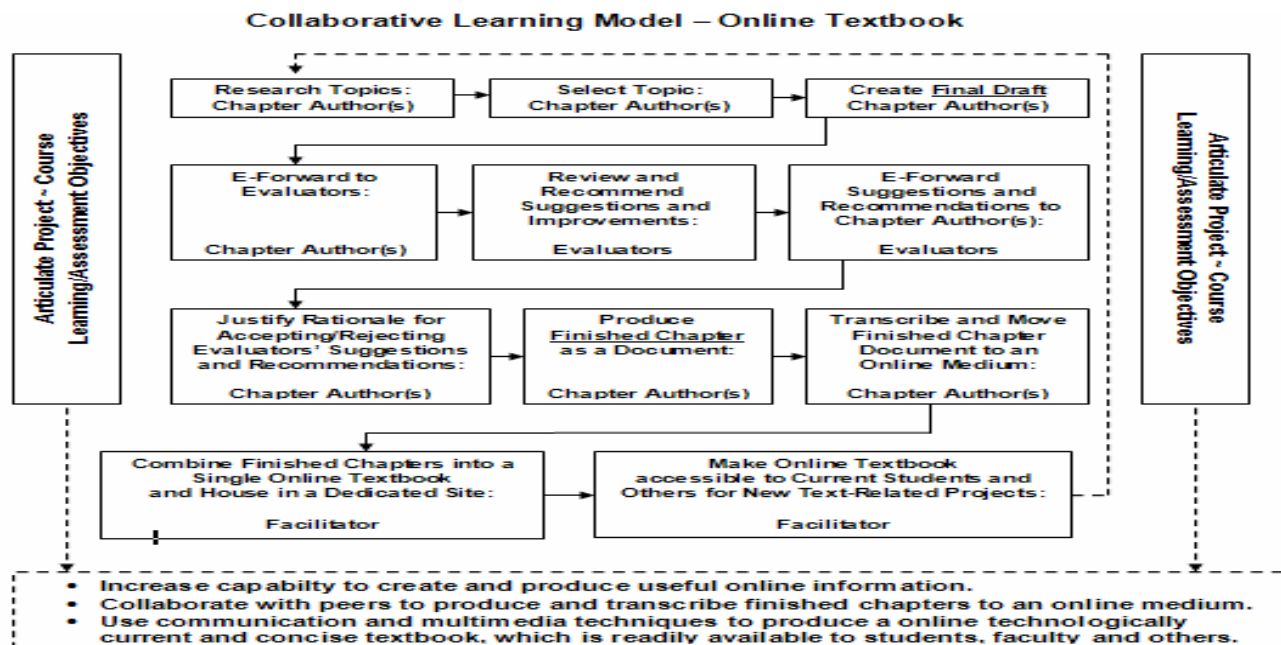
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INTRODUCTION

Traditionally, students are frequently assigned long papers on topics pertinent to the class in which they are enrolled. However, producing *useful* information for technical topics suffers from two limitations: Technical issues are inherently complex and technical advances can result in rapid degradation of topical currency.

Under this model, a student submits a draft or outline of the paper for evaluation and approval by the instructor. Step-by-step, the student progresses through the paper requirements, getting signoffs at each stage until the paper is completed. Once the paper is graded, it can be stored online and other students can be given a link to download it as a *Word* document or a PDF file. Yet, even when such documents go online, they may not be easy to access and read via the Internet since they have not been written to take advantage of the online medium. For information to be useful online, it will normally have a navigation system, hyperlinks and useful graphics [1, 6, 7] .

This paper presents a project design which addresses the limitations often found in producing technical literature and provides a model that engages the student in the learning process in a more meaningful way than traditionally has been the case. The model displayed in **Figure 1** gives the flow of the project.

Figure 3. Collaborative Learning Model

PROJECT DESIGN

Let's start with the following questions: C*ould 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 decrease the need for the instructor the gather most materials for the class?*

Writing an online set of books, book, or section can be done with relative ease in most upper-level classes. The system is designed in such a way that students:

- Research a topic pertinent to the class or subject.
- Develop and produce a complete paper on the topic.
- Evaluate the papers of one or more of peers.
- Revise/improve their papers based on peers' evaluations and include justification as to why they are making the changes.
- Make the information available online in a format conducive to that medium.

The book then can be put online and made available to all students in the class, as well as others outside the class. See **Figure 2** as an example of an online Book produced in this manner.

Figure 4. Online Book Example

Students would get ownership or attribution for their contributions to the online textbook as shown in **Figure 2**, and others would have a useful local resource for information that oftentimes is either not available or difficult to find.

Particularly in the case of technical information, topics become dated. Thus, as a means to assure topical currency and/or to improve or expand on a topic, students could be given the option to either create a new chapter or modify previously-created chapters, thereby increasing the breadth and depth of topics covered in the "online book or books."

This type of learner-instructor (more appropriately titled the facilitator) initiative produces a number of benefits.

Students profit 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 one or more others chapters.
- Hone their writing styles by incorporating suggestions and recommendations on improving their chapters.
- Broaden their depth of understanding on other topics by having to evaluate others chapters.
- Access more topical information for the class or subject easily [4].
- Research a topic pertinent to the class or subject.
- Collaborate on research as a group.

Similarly, **Facilitators** 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.
- Update information with less effort.

APPROACH

Select Topic

There are at least two ways to have students select topics. In the first approach, students are given a list of pertinent topics from which to select; after validating that each topic is unique (i.e., that it has not been selected by anyone else), they then choose their respective topics. In the second method, each student is asked to submit to the facilitator a list of four topics in most-to-least preferred order. Next, the facilitator (instructor) would delegate a topic from the list to that student or ask the student to suggest other topics. In this way, the facilitator can assure that a

wide array of topics is covered and can avoid the possibility of duplications.

Groups and group-size: If each student is developing a separate topic, the facilitator would arrange students into groups of three or four. If topics are being developed by groups, then *SuperGroups* are created by putting three groups into a single *Supergroup*.

Develop Paper

Each student or group of students go about researching the topic, collecting information and developing the paper, with the initial paper length of 15 – 20 pages, double-spaced. Students would be required to have a *minimum* of seven references (ideally more) including at least two book references. Once the student or group creates a "working draft" of the paper, it is uploaded to a webpage where it can be accessed by other students.

Recommendations

Then, the other members of the group can download the paper for evaluative purposes, including suggestions for improvement. 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, improving the quality of the paper, adding more pertinent information for the topic, improving the references, etc. Each student would use the tracking feature in Microsoft *Word*® or a similar feature in another word processor to notate suggestions and recommendations. Once their evaluations are completed, student-editors either email their evaluations to the original author or upload them to their web presence so that the paper's author could easily access and download the evaluation.

Modifications

Based on these recommendations, the author or authors would reevaluate the paper and create two copies of the final draft:

1. A version that shows the recommendations of the evaluators with the author's rationale for incorporating or not incorporating the given recommendation.
2. A "clean" version with all the agreed-to modifications incorporated, absent the editorial/comment markings.

Online Version

Once a chapter reaches this point, it is ready to be translated to a useful and visually appealing online document. Because the qualities of an online document differs 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 and be able to go from screen to screen within the chapter. Operationally, each screen could incorporate definitions as pop-ups driven by using the 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 in the chapter would also be necessary elements of the online version construction [1, 3, 5].

Since most 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 will need to emphasize how to use techniques that permit information to display correctly on the web. Also the students need to be given alternative ways to incorporate menus and page turners so that the reader can move from topic to topic or move to a specific topic easily and rapidly.

Many different products are available for designing web pages and menus, including Microsoft *Word*® and FrontPage®, Adobe Dreamweaver®, and many other HTML editors. For simplicity and illustrative purposes, Microsoft Word® has been selected to explain how to implement three approaches – (1) frames and files, (2) multiple files, and (3) a single file –to generate the menus and screens (pages):

DEVELOPING THE ONLINE VERSION

Frames and Files Approach

A chapter using Frames can be displayed in either a vertical or horizontal configuration as exemplified by **Figure 3** and **Figure 4**, respectively. Frame1 is where the menu would be displayed with a set of links (each link referring to a given page/screen), and frame2 is where the separate screens would be displayed. To link to the Introduction in **Figure 4**, you would create the hyperlink for Introduction in frame1 and set the file to be introduction.html and the target to be frame2 (where frame1 is the left frame and frame2 is the right frame).
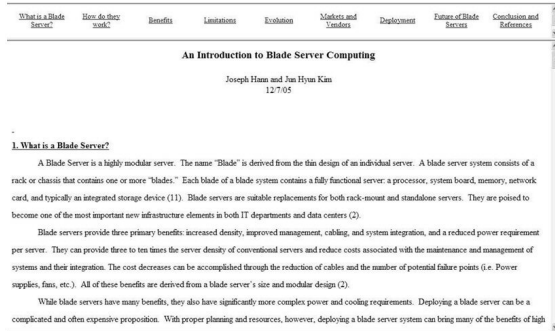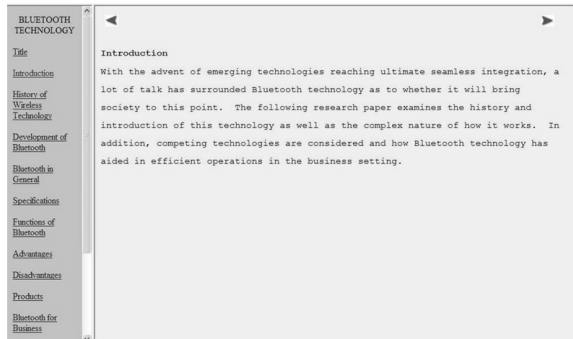
Figure 5. Vertical Frames

Figure 6. Horizontal Frames

Each screen or page would be created as a separate file. **Figure 5** displays a template for use when creating each page. The template makes use of tables and columns to create a correct visual display. A table could be created at the top of the screen with the border of the table turned off, the width of the table set to 100% and rows equal to two and columns set to three. Page Turner links can be added to columns one and three as seen in Figure 4. Because the width was set to full screen and the border was set to none, the page turner display appears without knowing it is displayed in a table

Figure 7. Single Page for Frames

Pages Approach

In this approach, a set of pages – instead of frames – is used. (See **Figure 6** as an example.) Instead of having two frames, one that includes the menu and

one that displays the data including the page turner feature, there is just one file that includes the menu on each screen. For the pages approach a template would be created with a menu and page turner feature. This template would be used to create each screen or page.
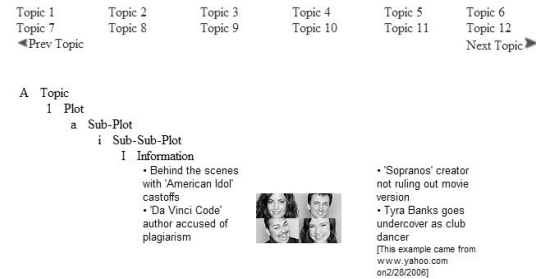

Figure 8. Page with Menu and Page Turner

One File Approach

The last approach covered is the one file approach. Here again the menu is created and all screens are created in the same file. Each screen is adjusted so that when you jump to a given screen you see none of the screen above or the screen below. This requires giving plenty of whitespace above and below the screen. As you can see in **Figure 7**, topic1 and topic2 are in the same file. If enough whitespace is left between the screens, only one screen will be displayed at a time.
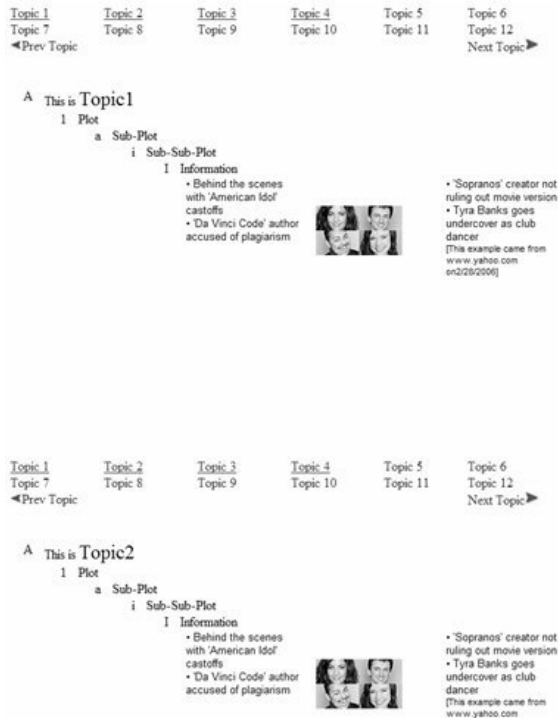
Figure 9. Single File Chapter

Other Features

There are other features that are needed when implementing an online chapter, these include adding graphics, creating hyperlinks, and allowing a mouse-over to display definitions or remarks.

Table 1. Adding Features

Adding Graphics	If a table is created with three columns, you can add a graphic by clicking on the middle column and then inserting the picture
Hyperlinks	Hyperlinks can be added to the chapter by highlighting a word or phrase and clicking insert/hyperlink, then typing in the link and selecting target= new page (this allows he link to be opened in a new page thereby leaving the chapter opened at the same time
Mouse-over Definitions	put <font color='red' title='<definition>'> before the item you want to give a definition for Put after the item The above would be added to the html source file

The last feature called relative addressing cannot be overlooked when creating an online chapter. Relative addressing is where the hyperlink in one page is given relative to the directory location of that page. An example is the following. Assume that you have two pages, page1.html and page2.html located in the same directory. We will assume the directory is at the following address: http://www.niu.edu/omis/book/rfid/. The two files page1.html and page2.html both reside in the rfid directory. When putting the hyperlink in page1.html to page2.html there are at least two different approaches to giving the address of page2.html. One approach is to type in http:// www.niu.edu/omis/book/rfid /page2.html, this is called absolute addressing.

The second is to type in the address as page2.html, this is called relative addressing. The benefit of using the second addressing mode is that when the chapters are moved from the student's web presence to the book repository web presence the links will still work. Whereas when the student graduates or changes the location of their web presence the original web presence would be gone including the pages and links used to create the book chapter.

Once the students create their online book chapter and have all links working correctly they send the chapter to the facilitator as a compressed zip file. The facilitator then creates a web presence for the book and using one of the three techniques, Frames and files as displayed in **Figure 3** and **Figure 4**, Pages approach as displayed in **Figure 5** or the One File Approach as displayed in **Figure 7**. They create a directory inside the book web presence for each chapter of the book and create links to each chapter as displayed in **Figure 2**.

At this point the book is created and available for easy viewing online [2]. The facilitator then gives those wanting or needing access to the book the URL and the book is virtually published.

SUMMARY

We have discussed some of the benefits when students perform their assigned research projects utilizing the advantages available via the internet and then post their research on the internet in a form making use of the online environment [2, 4]. A "collaborative learning model" was presented. The process displayed in the model, were explained and three different approaches to creating the online chapters were explained. This process was implemented last year. Student response to developing and making use of online books has been

very positive during the last two semesters. The benefits realized by the facilitators have also warranted continuing and expanding the development and use of online books.

The next step is to develop a survey instrument to quantitatively evaluate students' perceptions of developing and using online chapters developed by themselves or others. We hope to summarize this information and present it at a later date.

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