10.7 A Multidisciplinary Approach to Web Site Development for Classroom and Distance Education

Editorial

There are a number of different models emerging for the building of complex Web sites and maintenance of Web-based course materials. Faculty who have developed the skills can construct and maintain their own Web sites using the latest in Web-development tools. Many institutions are adopting "course containers"–such as Blackboard and WebCT–that offer templates to assist faculty in Web-based course development and require little or no programming.

This month's article describes the use of a multi-disciplinary development team to construct a complex Web site, the content of which requires constant updating. The team consisted of technical personnel, faculty, and students, with faculty taking the lead as content and "teaching experts." One of the goals was to so simplify the updating process that it could be turned back to the faculty. The development process is discussed, and the article concludes with "lessons learned" that can assist others involved in the same tasks.

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Editor

A Multidisciplinary Approach to Web Site Development for Classroom and Distance Education

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Abstract

This paper describes the use of a multidisciplinary team to design a Web site. The Web site has been used in a graduate health administration and policy department as part of a master's of health administration curriculum for a course designed to give students an introduction to environmental and workplace management for health care facilities. The Web site was used for in-class presentations and as a principal resource for students to each research a selected case. Reference sites were organized into content areas to allow students to access sites with information about each case. A design team consisting of five individuals merged their various talents to develop a functional, user-friendly, technically sound Web site for use as part of a special topic course for resident and distance students. This paper discusses the advantages of the multidisciplinary approach to Web site design.

Introduction

The successful development of a Web site that will support classroom and distance education can be achieved through careful planning and the application of a multidisciplinary approach. About two-thirds of the 3,200 accredited "brick-and-mortar" four-year colleges and graduate schools in the US now supplement their campus offerings with classes via the Internet, as well as live satellite feeds, cable television, and videoconferencing (Clark 1999).

Thirty-three percent of all college classes are using Internet resources as part of the syllabus, as compared with 25% in 1997 and 15% in 1996. Almost 25% of all college courses are using World Wide Web pages for class materials and resources, as compared with 8% in 1996 and only 4% in 1994 (CHEA 1999).

This paper describes the use of a multidisciplinary team to design a Web site. The Web site has been used in a graduate health administration and policy department as part of a master's in health administration (MHA) curriculum for a course designed to give students an introduction to environmental and workplace management for health care facilities. The Web site was used for in-class presentations and as a principle resource for students to each research a selected case. Reference sites were organized by content area to allow students

to access sites with information about each case. Each student was required to develop a "management plan" to address the issues of each case.

A design team consisting of five individuals merged their various talents to develop a functional, user-friendly, technically sound Web site for use as part of a special topic course for resident and distance students.

Background

> Educational technologists need to work creatively with faculty and students to devise truly viable applications that fulfill real needs. There are good reasons for sticking with interactive text-based systems and supplementing them with visual and other online resources rather than attempting to duplicate face-to-face education online. (Feenberg 1999)

Tracing the evolution of The Open University, which is developing United States Open University as a private non-profit "sister" institution, the vice chancellor observed that designing and operating distance courses and programs requires teams of experts. As a result, faculty members operate as knowledge specialists, as compared with the generalist role they play in traditional institutions, where they typically handle all aspects of course presentation and administration. Judging by the longevity of faculty service at The Open University, he said, most find this change both exciting and rewarding (CHEA 1999).

The use of a multidisciplinary team is essential. Developing Web-based courses takes more time than developing traditional courses with respect to both the support and maintenance time (Vishwanathm, Wilkins, and Jevec 1997). Additionally, faculty responsibility and workloads will undoubtedly change as faculties become involved in technology-based delivery and instructional support systems. Less emphasis will be placed on lecturing, and greater emphasis will be placed on facilitating the educational process. Efforts will be made to draw upon the capabilities of technology to increase student learning productivity by (1) integrating technologies in ways that are tailored to the optimal learning modes of individual students, (2) capitalizing on the flexibility of technologies to make better use of student time, and (3) making faculty content and delivery specialists available to students independent of location. Faculty will be learning facilitators, intervening when needed and selectively providing motivation and assistance to students. They will find it easier and more compelling to collaborate and will also increasingly work with multiple providers and institutions, team with other faculty, and make specialized contributions in skill and knowledge areas as well as in instructional functions (e.g., courseware development). New definitions of faculty activities will be needed, as will new ways to measure faculty workload (NPEC 1998).

While there are a multitude of technical and computing issues to resolve, the primary issues are educational. This stance is necessary to ensure that outcomes are driven by what teachers believe is educationally useful, rather than by what computing experts want to provide. At its simplest level, this approach means that teachers involved in the project can suggest what they would like to be able to do with the Internet. Technical staff may then take these directions as problems to solve by, for example, finding software suitable to the teachers' needs.

With educational concerns at the forefront, teaching experts are likely to emphasize the use of the Internet in innovative ways to maximize interactivity with and between learners and teachers using active learning strategies and learner support. These kinds of approaches are more likely to ensure that the learner gets an educational service that promotes his or her interests.

The introduction of the Internet for instruction will greatly alter the role of teachers. Teachers will be involved in a different type of learning with which they may be unfamiliar. Where much of their past work has been in the role of a transmitter of information and a guider of student learning activities, this will change substantially in the learning environment enabled by the Internet. Where encouragement is given to students to access the vast range of information available on the Internet and to actively communicate with others around the world on a particular topic, the teacher will become much less the single authority on subject material and, in many cases, a co-learner with their students. The teacher's major responsibilities will be to facilitate students to achieve the particular competencies or learning outcomes associated with a course as well as to be responsible for monitoring quality.

> Teachers must have access to technical support from staff who are both technically competent and able to communicate well with teachers who may be at very basic levels of understanding . Confusing or intimidating advice from technical staff is one of the major stumbling blocks for teachers coming to terms with first the technology and then the range of issues associated with the professional and educational implications of teaching on the Internet. (Armstrong 1996)

Goals and Objectives of the Web Site

This Web site is designed for use in a special topics course in the MHA curriculum accredited by the Accrediting Commission for Health Services Administration. Students in this program take a curriculum consisting of a series of required courses in typical areas of management, including financial management, human resources management, marketing and strategic planning; statistics; and operations research. Specialized courses are offered to train students in health care as well. As part of the curriculum, students are required to take several elective courses in areas of interest and specialization.

This Web-based course is designed to provide students with an introduction to regulatory compliance associated with environmental and workplace management. The workplace and environmental regulations that apply to health care facilities are becoming more complex with each passing year. Common issues include waste management, environmental protection requirements from both federal and state governments, local environmental regulations, workplace safety and health regulations, emergency plans, community and worker right-to-know requirements, and a host of other environmental and workplace requirements. As health care facilities advance into the competitive marketplace, unplanned costs necessary to resolve regulatory issues are a clear competitive disadvantage. Regulatory fines are paid from profit. Health care facilities may be viewed more as businesses and less as community institutions and, as a result, may encounter a less

forgiving regulatory environment. The Web site will be updated on an ongoing basis to provide easy reference regarding this complex subject for class participants and other site users. It has been designed for eventual use as a resource for program alumni and other health care professionals. It is a complement to course work offered in the Department of Health Administration and Policy's MHA (http://www.musc.edu/hap/). Hopefully, it will be a useful tool to help students and managers alike to better learn about and manage these complex regulatory issues.

Site Design

The interdisciplinary team responsible for the Web site described in this paper was successful because it

1. followed a formal project plan;
2. established clear goals, objectives, and Web site requirements;
3. obtained student input;
4. communicated clearly and frequently through periodic design meetings;
5. divided the work according to the expertise of each team member.

This site is organized with a basic split between workplace and environmental regulatory resources and contains many links to regulations and supporting information. While some of the features are designed to help students, they should also be of use to practicing professionals.

Formative evaluation of the site was a critical component of the design process. For example, in order for the site to remain current, the developers wanted to design a tool that would allow faculty to easily update the site without extensive outside support. Therefore, a password-secured "workspace" was designed as part of the Web site. This workspace consisted of various forms that faculty could complete to update the database driving the Web site. Updates were immediately reflected in the site, and faculty did not need knowledge of HTML. The development of this workspace required continued evaluation and changes until it functioned flawlessly and met the needs of the faculty.

In addition to feedback from faculty, two sessions were held with students: one before and one during the development of the site. The purpose of these meetings was to assess students' initial reactions to the site layout and to discuss Web site features that students might find useful. The students had three major requests: They wanted links to the various communication tools integrated in the site, links to related sites that could be used for references and resources, and short download times. Therefore, since many students would be accessing the site with a fairly slow connection, graphics were kept simple and small in size, thereby minimizing waits for downloads.

Evaluation of the site was an iterative process with frequent and regularly scheduled meetings. Development followed the design process outlined in the "scope of work" contract. All members of the team participated in nearly every meeting. Design functions and features were discussed at every meeting. Discussions regarding such topics as navigation, various features, and content were made based on the original objectives and purpose of the site. In addition, checklists were used for evaluating the site prior to its final publication.

Lessons Learned in the Development Process

From not only this project, but also six years of experience in the development of Web sites and computer-assisted instruction, many lessons have been learned, including the following:

Project Management

a. Weekly reviews of the status of projects are critical (e.g., Where are we in the production of this project? What do we need to work on next with this project?).

b. Encourage contributions from everyone; you never know who will be the source of a great idea.

c. Celebrate when projects are complete.

d. Things are going to go wrong; be as prepared as possible.

e. Everything takes three times as long as you think it will, even if you know what you are doing.

f. Encourage other team members to take the lead on projects.

g. Encourage a climate of freedom and safety; this is a climate in which creativity, flexibility, and leadership can flourish.

h. The project manager's job is that of a steward; make sure everyone on the team has what they need to get the job done, then get out of the way.

i. Go the extra mile for your clients; encourage close relationships with clients. Show them you care about them, their students, and their projects.

j. Be realistic in what you promise.

Instructional Design

- The most important thing to remember is this: It's all about *learning*–not the technology; the technology is simply the vehicle that allows for distribution of the learning.

- Develop programs that encourage communities of users/learners through e-mail, chat lines, discussion groups, etc.
- Make sure the objectives are clear to everyone.
- Have an iterative process in place for development and evaluation
- People are going to want more than what was in the original contract; with Web sites, make sure there are ways built in to return as much control of the program as possible to faculty, so they can update, change, etc.
- Clear directions are difficult to write, but they are critical to the success of the project.

Programming

a. Get as much of the content as possible from clients as early as possible, because things will change; time can be wasted if clients change their minds after content has been entered.

b. Keep your file names simple and organized.

c. Make sure clients know up front what features are possible.

d. Use a checklist that is developed by everyone involved in the project, and include all aspects of the project, such as navigation, database functioning, media, graphics, grammar/spelling, directions, etc.

e. Keep navigation simple.

f. If you're using databases, test and test until you absolutely cannot think of another way to try to break the system; you want to make sure data is not being lost and that it can be easily retrieved.

g. Make sure that the sound and video play on numerous computer platforms and/or browsers.

h. Ensure that the graphics look good on all platforms and all browsers.

Graphics

b. Establish a structure and organization to the site.

c. Determine the ease or difficulty of use.

d. Create graphics that add to the site, not those that take away from it.

e. Ensure that graphics

load fast,

are easy to read,

are informative both in navigational and educational purposes,

are clean and clear, not distracting

f. Graphics accompanied with text can add to educational material through visual representation.

g. Take into consideration different computer systems, connection speeds, and browsers when designing graphics for a site.

Implementation

In general, the Web-based course was designed to give health care managers methods for evaluating and solving complex environmental and workplace management issues that may arise in health care institutions. Students were required to pick one of the six cases discussed in class and develop a report "to the board of directors" with an assessment of the problem and a course of action to evaluate, manage, and settle the case. This format was used in order to simulate actual work circumstances where factual summary information, concise analysis, and well-formed and contingent recommendations are often needed to aid management in complex decision making.

The formal course objectives are that, at the conclusion of the program, participants should be able to

- identify major workplace and environmental regulatory issues and related statutes,
- articulate the relationships and drivers between regulatory requirements and management decisions (cost, social impacts, environmental impacts),
- distinguish these regulatory areas from federal cost management regulations,
- describe basic methods for managing regulatory requirements,
- analyze competing needs, issues, and processes that are driven by regulation.

The class's experience with the site was excellent. All class presentations are integrated within the site and can also be presented using overhead computer projection equipment in a classroom specifically designed for computer and Internet use. Lectures were easily accessed. Information links for the site related to specific areas were easily accessed to enforce and demonstrate management and regulatory compliance concepts. An example case study was first developed using traditional handouts to demonstrate the process of conducting a case study. A detailed review of the facts of the case and how these facts could be developed from traditional information resources into a management solution was undertaken interactively with the class. The same case was then demonstrated using the Internet resources organized on the Web site under the Laws and Regulation heading. Additional class time was spent demonstrating the different items from the annotated

bibliography for Internet sites under the Case Studies and Recommending Agencies headings. A classroom demonstration on the retrieval of information related to the test cases was performed. Students then used a similar approach for developing their own selected cases.

The class has been offered three times to a total of approximately thirty students. Each student successfully

1. developed and evaluated a case study addressing a problem in which they were not technical experts;
2. identified key issues and drivers to evaluate the facts of the case;
3. correctly evaluated case facts;
4. identified appropriate regulatory requirements;
5. made appropriate value judgments;
6. recognized contingencies and action plans needed to adjust to various possible outcomes.

Conclusions

There are several key factors that led to successful Web site development by this multidisciplinary team.

• Medical University of South Carolina (MUSC) has several models that encourage faculty to develop computer-based instructional programs. Although each model has strengths and weaknesses, we support the collaborative model as suggested previously.

• Although faculty workspaces provide an efficient method to update Web sites, it is necessary for faculty to learn Web site technical skills. These skills include using an HTML editor, uploading files onto a server, and using graphics software. A carefully coordinated team can most efficiently accomplish skill development for faculty and site design. Like using a car, using Web site development tools is not essential, but it is essential that faculty develop the user skills necessary to be self sufficient in keeping the Web site content up to date. By using teams, faculty can be supported by skilled professionals to meet their needs. The more complex the site, the more essential the team approach. Complex sites that include sound and database interactions can be best and most efficiently developed when teams are used.

• The goal of Web site development is to provide effective tools for learning, not to use technology for technology's sake.

• It is essential to maintain faculty involvement and create workspaces for faculty to learn essential Web site management skills while having team support when necessary.

Please contact Dr. Michael T. Ryan at the Medical University of South Carolina with questions, comments or suggestions (ryanmt@musc.edu, 843-792-1926).

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