

DESIGNING, DEVELOPING, TEACHING AN E-COMMERCE WEB DESIGN CLASS

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ABSTRACT

IS departments preparing students for web design/development positions need an e-commerce web design course. This paper describes the E-Commerce Web Design course created and delivered at Utah State University.

Keywords: e-commerce, web design, web development, distance education

INTRODUCTION

This paper describes a Utah State University E-Commerce Web Design course created in 2001 as a proactive means of preparing students for the changing workplace. Discussed are the research involved in designing the course, revision of the course, experience of teaching the course via satellite, and feedback from the students and clients of the course. Educator access to all course materials may be obtained by emailing the author at jpratt@b202.usu.edu.

Identifying the Need

An estimated 544.2 million people were online (11) in February 2002. The Boston Consulting Group (with data from Forrester Research) estimates a rise in consumer spending in 2002 to \$72.1 billion (5). E-commerce sites are scrambling to grab their share of that consumer spending. To generate profits, e-commerce sites need to develop websites that gain and maintain customer loyalty from repeat customers, who are responsible for 53% of online revenues (7).

Students from information systems (IS) programs may be the best prepared to create effective e-commerce websites because they have a strong background in complex database infrastructures and business management perspectives. Providing IS students with strong web design skills using the industry standard in web development tools makes them more marketable. Utah State University prepares its students by offering an E-Commerce specialization that includes a web design course to complement nicely the strong repertoire of IS courses provided.

Selecting the Software and Texts

The decision to go with the Macromedia products was based on the following reasons:

- Demand for the Macromedia products in jobs listed on monster.com
- Free 90-day trial of the software with *Web Design 101* instructional materials
- Clean code of *Dreamweaver* (compare with Microsoft *FrontPage*)
- Recommendation from randomly selected webmasters
- Comparative rankings in the trade journals
- WYSIWYG, click-drag-drop editing with option for HTML editing
- Seamless interface among the HTML, graphics, and animations packages

The initial choice to go with the Macromedia suite (*Dreamweaver, Fireworks, Flash*) proved correct: they are the leading web software packages used in industry today (3, 6). (Adobe *Photoshop* is, of course, the leading multipurpose graphics application.) Indication of industry demands for the Macromedia products was confirmed on monster.com and flipdog.com (see Table 1 at <http://www.pcu.net/web/prattbj/iis/ecomclass.pdf>). FlipDog.com enables scoped searches within keywords to further isolate the purposes for which the products are used.

The texts currently used in this course are the *Visual QuickStart Guides* by Peachpit Press (2, 13, 14). Although reference books (e.g., the *Bible* series by IDG) provide more information, students preferred the step-by-step instructions with pictures typical of the *Visual QuickStart Guide* series. The *Robin Williams Web Design Workshop* text (12) provides useful ideas from a graphic-designer perspective. Her related text, *The Non-Designers Web Book*, provides the basic design principles by which the sites were graded (15). Jakob Nielsen's *Designing Web Usability* text (10) includes useful information but lacks research citations for substantiating his claims.

DESCRIPTION OF THE COURSE

Over 200 students have taken this course. Each semester they create two websites and *Flash* promotions for real clients. Students are graded on homework assignments, hands-on exams, and their websites. This course was taught both on campus and via satellite.

Students

An average of 41 students took this course each semester. There was a wide spectrum of prior web design and computer experience evident. Although many students had taken an HTML, Java, or C++ course, some students struggled with basic file structure and the concept of publishing files to remote servers. The class curriculum was revised—over the course of three semesters—to meet the needs of the majority of students. A few students at either end of the experience spectrum still wanted the class to be more/less challenging.

Websites

The overriding goal for the E-Commerce Web Design course was to provide students with marketable skills in web design and development. Students created three portfolio-quality web experiences (two sites and one promotion). Student feedback indicated that the portfolio projects were instrumental in helping them obtain web design/development positions. Students could work on the sites individually or in pairs. The grading criteria and samples of student sites are located at <http://www.pcu.net/web/prattbj/5450/index.htm>.

It is critical that students start with a text-based website for the following reasons:

- To learn the importance of logical organization and intuitive navigation
- To learn the basic principles of design (contrast, repetition, alignment, proximity)
- To learn how to develop a website that is Section 508 compliant (web accessible)
- To focus on the audience and content analyses without the distraction of graphics

Although there were no restrictions on which tools the students used to create their websites, students were encouraged to use the Macromedia products: *Dreamweaver* for the text-based site

and *Fireworks* for the graphics-based site. Some students used *Notepad*, *Photoshop*, and *ImageReady* to create their sites, but they all took the exams using *Dreamweaver* and *Fireworks*.

The emphasis for the graphics-based site was to break out of the rectangular design predominant in most HTML websites. Students were encouraged to think artistically while simultaneously monitoring the structural organization and navigation of the site. Students were discouraged from just inserting some graphics and then calling the site a graphics-based site.

Students created the animation-based site or promotion using Macromedia *Flash*. An entire semester could be spent just developing *Flash*-based sites using *ActionScript* (the scripting language of *Flash*). Therefore, this course now just covers basic motion and shape tweening, buttons, symbols, and basic *ActionScript*.

Clients

During the field test of the course, students created their own websites. Starting with the Fall 2001 class, students created sites for clients selected by the instructor. Working with real clients has proven to be a valuable learning experience for the students: Clients don't really know what they want until they see it. Clients continue to add content. Clients may not have a strategic marketing plan with target and content analyses. The *Robin Williams Web Design Workshop* (12) describes well the client/contractor relationship.

Each client completed and returned a worksheet that detailed the who, what, and why of their audience and content analyses. This worksheet combined the Instructional Systems Development (ISD) model (4) and the retail strategy worksheets developed by Neidorf and Neidorf (9). A copy of the worksheet is located at <http://www.pcu.net/web/prattbj/5450/web/clientdesign.pdf>. Students used the completed worksheets to design the clients' sites.

Using three different clients per semester (one per portfolio project) was somewhat successful. The benefits of using three different clients were that (a) students were exposed to different client relationships, (b) students had a wider variety of portfolio projects, and (c) some students were ready to move to different content by the time each website was due. The drawbacks to using three different clients were that (a) valuable time was spent learning new content, (b) the first client didn't receive the best quality, and (c) it was difficult to find a client whose content was best presented by a text-only website. Because of the shortened summer session, students were exposed to only one client. That seemed to work well.

Grading

The mean grade for this course—not counting the two field-test semesters—was 85%. That mean was based on the following means: assignments, 83%; exams, 83%, websites, 87%. The mean exam grade for Fall 2001 was 76%, possibly because the students had only 75 minutes—not the current 1 hour and 50 minutes—for each of the three, hands-on application exams.

The grading structure that seemed to work well for this class was assignments: 10%, exams: 50%, and sites: 40%. Included in the assignments were web awareness exercises (10 points each), questions based on the *Designing Web Usability* (2000) text (9-23 points each), site designs (25 points each), and software skills (1 point each). Students wanted to start creating sites immediately, so it was important to give the paper-based design document significantly more weight than the other homework assignments. The skills homework served mainly as a method of preparing for the exam and receiving instructor feedback.

Students worked individually or in pairs on the websites, so individual assessment of skills via exams was necessary and carried more weight than the websites. The exams were hands-on applications of the software skills and were open-note, open-book to more realistically simulate the workplace environment. Students were given a hard copy of the test instructions and a url to a completed example of the test website. Extra assistance was necessary during the exam to protect test security from students who may (a) copy the test to their ZIP disk, (b) copy and modify homework assignments from their ZIP to the test, (c) FTP the test to their server account, (d) copy and modify the online test example. An alternative to providing the students with the url to the sample test was to just display the test on the projection screen.

The websites constituted the greatest learning experience of the course. It was only through struggling with the content and the software that the students truly synthesized their learning and applied it to a new instance. The student(s) who created the No. 1 site selected by the client earned a 5% grade bonus for that site.

Satellite Class

The E-Commerce Web Design course was taught via satellite for the first time Summer 2002, with 17 students in the same classroom as the instructor and 27 students receiving live 2-way audio/1-way video transmission of the class from nine satellite sites throughout Utah. The benefits of distance education have been widely touted (e.g., Ludlow) but this mode of delivery also includes challenges you may face at your institution. Here are some of the challenges and solutions encountered at Utah State University:

- Individual students isolated at sites. Solution: provide extra phone and email support.
- Inability for students at correctional institutions to participate due to required internet access. Solution: Cache all urls referenced throughout the course; assign an officer as a conduit for FTPing homework/websites to the server and transmitting email messages between the instructor and the students. However, FTP skills are a critical component of the course.
- Problems with video/audio transmission. Solution: hold an online 45-minute review period immediately preceding each class session to cover missed content and answer questions.
- Insufficient software licenses at the remote sites, resulting in the need for students to share computers. Solution: use 30-day trials of the software applications; schedule the learning and testing to occur prior to the expiration of the trial periods.
- Mid-class software upgrades forcing upgrades for all students/sites using the trial versions and outdated textbooks. Solution: make it a learning experience; expose students to the process of upgrading from one version of software to another; demonstrate skills in both versions, identifying the similarities and differences between the two versions; introduce students to Macromedia's online lessons, tutorials, and help systems.
- No computers at remote sites: Solution 1: allow students to use their own laptops and connect to a hub for internet access. (Test security may have been compromised by this solution, although stringent monitoring was in place.) Solution 2: allow students to access the class via

streaming video/audio from personal computer and take exams from another remote site. (The video was too small for legibility over the computer monitor, but the audio was clear. The student would familiarize himself with the application before the class started so that he could follow along via the audio. He also had an 800 number to use for asking questions.)

STUDENT FEEDBACK

The mean score for *Quality of Course* from Spring 2001 through Spring 2002 was 5.3/6.0; the mean score for *Instructor Effectiveness* was 5.4/6.0. There were significantly more positive comments than negative (see Table 2 at <http://www.pcu.net/web/prattbj/iis/ecommclass.pdf>).

Of greater importance to us as educators is the written feedback. (Course/instructor evaluations for Summer 2002 were not available by press time. However, survey responses from 20 students are included in the feedback themes below.) The following course-related themes emerged from student feedback:

The use of Real Clients and Relevance of Course Content to the Workplace

Fifteen students commented on the value of creating real websites for real clients. Specific comments included: “Working with real clients motivates us to do our best and get real-world experience at the same time” and “Creating projects for actual clients and also competing with others in the class for the best design were great incentives for us to put our best effort into the projects.” However, working with real clients can be frustrating: “I realize that in real life, some clients don't know what they want either, but particularly given the time constraints we were under, having to guess what the client was looking for made it even tougher.”

Grading and Testing

Students overall commented that they thought the course grading was fair. They liked the fact that homework assignments were worth only one point each and 10% of the course grade—with the weight of the course grade distributed between tests (50%) and websites (40%).

Objective grading of the sites was achieved through site evaluation sheets. Some students perceived the grading to be strict and harsh, while others commented on the usefulness of the detailed feedback that enabled them to make specific corrections to their sites.

The tests generated the widest variety of comments in the grading category. Most of the positive comments referenced the format of the test: “Having open-note, open-book tests was representative of the real world: keep that.” Students also appreciated having extra-credit points on the tests and being able to take the tests on the computer. Most of the negative comments referenced the time allotted and the content covered. Students requested either shorter tests or more time, even when the tests were 1 hour and 50 minutes long and the average grade was 87%.

Structure and Organization of the Course

Students especially appreciated the detailed structure of this course. Comments included: “I like your syllabus and booklet approach to assignments... I felt like I actually knew what was expected of me, and when it was expected, from the first day of class” and “The structure of the course was organized so that in relatively short time we learned so much information.” Students

commented on the usefulness of the practice homework and helpfulness of the online examples. Students also liked the ability to practice the software skills in the class before having to apply those skills to a client's website. The main request was for more class time to work on projects.

Software Issues

Flash seemed to generate the widest variety of software comments. Students responded with comments such as "I loved *Flash*" and "I wanted to learn more about *Flash*" as well as "Omit *Flash*." The majority of the other software-based comments reflected frustration with using two different versions of the software (Summer 2002 only), the fact that the 30-day trials expired before students completed the course, and the inability to find the software in all the campus labs. Students liked the WYSIWIG interfaces and the interconnectedness of the Macromedia suite products. They also recognized the Macromedia products as the industry standard.

Course Content and Workload

The workload for this course was very heavy, which generated complaints. Students complained about the fast pace of learning and the heavy workload ("Every semester tries to cram more and more into one class. I feel this is unfair." "There was too much material for one class." "This class requires too much time out of class."). Several students recommended splitting the applications into different sections/semesters, teaching the course during a longer session, or covering less content. Yet, when queried about which content to drop, most students wanted to keep all the content and even add additional content.

In contrast to the complaints of a heavy workload, ten students wrote that they wanted to learn more advanced, complex features of the software applications. They suggested moving all the beginner-level skills to a prerequisite course. (One student suggested that the current content was too advanced for the average graduate student.) Students also wanted more HTML and JavaScript content so they could tweak the code generated by the Macromedia products.

CLIENT FEEDBACK

All the clients were pleased with the students' websites. They provided feedback such as "The top students of the class surpassed my expectations. It was difficult to select from the top five" and "WOW! You know, I cannot describe the feeling to have something that you have worked so hard for, for so long to take on animation and sound and come to life! Some of those sites actually give me a lump in my throat!"

Three clients (out of six) responded to a post-experience survey. The main complaint was that the students did not follow their instructions regarding the website content and target audience. A client also suggested that future requirements include the actual publication of the site on the client's website (rather than on the university website) and that clients have more contact with the students (he met with the class twice and then corresponded via the instructor).

SUMMARY AND RECOMMENDATIONS

The *E-Commerce Web Design* course at Utah State University is a rigorous course that helps prepare students for positions as web designers/developers. The benefits of the course are that

students learn three software development applications, create two websites and a *Flash* promotion, and work with real clients. The drawbacks of this course for students are the heavy workload, the fast pace at which students must learn and then apply new concepts and skills, timed tests, and working with indecisive clients.

Recommendations for educators interested in using this course include the following:

- Consider reducing the course workload. The heuristic ratio for study/class time is 2:1 (1). This course was developed on a 3:1 ratio.
- Use only one client per semester.
- Revise the tests to fit within a regular class period.
- Use a prerequisite course to teach the basic software skills.
- Teach how to link the websites to an IS database.
- Give clients a more active role in the course.

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