Using the Web to Serve Students as Information Clients

Thomas J. Beirne
California State University,
Sacramento, CA, USA

beirne@csus.edu

H. David Brecht
California State University,
Sacramento, CA, USA

brecht@csus.edu

Eugene H. Sauls
California State University,
Sacramento, CA, USA

sauls@csus.edu

Abstract

This paper presents an information-client strategy for an academic department's use of the web. The goals of this strategy are to maintain the department's range of course offerings in the face of low enrollments and budget constraints, serve different student constituencies, and engage faculty who have diverse web-capabilities and interests in web-sites and web courses. The paper illustrates web-delivery technology that is currently available rather than develop advances in web course or web site methods. Our discussion is based on our experience as accounting educators at a state-supported, commuter campus. We explain the intent of our academic department's web pages and assess their effectiveness. The paper is developed from the perspective of a Business School's Accounting Department that primarily teaches Accounting students. It deals with issues and IT capabilities representative of a non-information-technology faculty and non-IT-focused students.

Keywords: faculty, web-pages, academic, cost-effective, web-courses

Introduction

In this paper, we address how an academic department can use the web and web-related technology to serve a variety of student constituencies as information clients. We understand the term "information clients" to imply the recognition of diverse groups of students and other constituencies important to students (e.g., employers and other professional groups) as customers with information and service needs that can be met or facilitated by the department. An academic department's range of information service includes the administrative guidance it provides to students; data it can refer students to or collect about job, scholarship, or other opportunities; and information about its course offerings and faculty.

This paper is developed from our perspective and experience as accounting professors at a state university in an urban area where students have jobs, live off-campus, are older, and have families. Our state-mandated educational mission is to educate a broad cross-section of the people of California (USA). The Accounting Department is located in the College of Business, and we deal with issues and IT capabilities representative of a non-information technology faculty and students.

As a key motivator of action toward this type of information-client strategy, an academic department can exploit the web to maintain its range of course offerings in the face of low enrollments and budget con-straints. Also, as an influence in developing the administrative unit's web pages, the department has a vested interest in informing and linking students and employers. The department has a substantial interest in gaining the support and sustaining the connection to the department of the various student and employer (or professional stakeholder) con-stituencies. Accordingly, the department should tailor its web services to meet the needs of these

constituencies.

To accomplish these objectives, an academic department must deliver web-support resources to its staff and faculty. Fortunately, products such as those offered in Microsoft Office make the development of basic web pages rudimentary. The principal challenge for faculty or staff is to get the web pages up on a web site and to design the site. Of course, further challenges, often substantial, involve the use of more advanced web technology such as interactive programming or audio/video streaming. The department must engage and empower its faculty where they have diverse web-capabilities and degrees of interest in web-sites and web courses.

In this paper, we present examples of our personal and our academic department's efforts to make the web serve students. The key forces that motivate an academic department's involvement with the web may be self-interest, but its effort must be toward the satisfaction of students as service and information customers. We invite discussion of the experiences of others to make the web a working tool to serve students, rather than only using the web to reflect a faculty member's or the academic department's image.

We first discuss academic department web pages, then faculty web pages, and then web courses. Departmental web pages should include or provide links to all academic material available to students. Faculty web pages are a subset of the departmental web pages, and course materials are a subset of the faculty members' web pages. In our academic department, progress in implementing this strategy is fragile – depending on a particular administrator's recognition of the vision and use of resources, faculty members' interests and strengths, and the leadership the department has available to gather support for the strategy and delegate authority for required actions. We have found many faculty and staff with significant web design and deployment abilities. The problem is to bring the parts together into a whole, implementing the web-use goals as a unified, effective departmental strategy.

Academic Department Web Pages

We categorize student needs in five broad areas: activities for career growth (student organizations), employment opportunities and related information, scholarship opportunities and related information, administrative information, and course and instructor information. As part of the department's service to students, we also recognize the category of "conferences and events" – the need to be professionally engaged to the ultimate benefit of students. A link to the second page within our department web site that depicts these six categories is: http://www.csus.edu/accy/frames/accylogo-parent.f.htm .

Student Organizations

Within the student-organizations link are links to specific accounting organizations that have known interest to our students and to student chapters of these organizations. Also, there is a general link to a University page with lists/links to a wide variety of student organizations represented on campus. http://www.csus.edu/accy/frames/site-2.f.htm

1. Many students are lost and discouraged in the maze-like network and by the degree of time and effort it takes to access opportunities available to them. We seek to make our department web site a gateway to these opportunities, where the least ingenious student can log on and comprehend the scope of what is available. We also provide information and links so a student can contact the persons offering the opportunity. We attempt to apply this concept throughout the department web site.

2. We encourage our student accounting-organizations to develop their own web sites. We provide links to them from our page that describes the organization. We hope that this approach leads by example in the use of the web and encourages students to participate with the department web site by guiding us in the organizational information we present.

3. The success of students' involvement with the department site and the development of their own organization sites are heavily dependent on the extent of their web abilities and the interest of the student officers of these organizations. We have encountered examples of perfunctory, exceptional, and no involvement.

Employment & Scholarship Opportunities

This site includes a range of information and links that fit under the theme of students' interest in financial support – either while in college or upon graduation. As with most of the information in the department's web site, the information here can be accessed by a student contacting the appropriate offices on campus. However, this is a disadvantage to non-ingenious students or those whose time constraints make searching for what to do a delaying or limiting factor in their access to opportunities. We intend for this set of web pages to provide one-step, easy comprehension of what is available in financial support and how to access it. http://www.csus.edu/accy/frames/site-3.f.htm

The areas addressed, the details included, and our specific student-service objectives are summarized below.

1. "Internships and Job Openings" provides an archive of job announcements (part and full-time) that have been received by the Business School's Student Affairs Office (SAO) and emailed to a student distribution list. Our objective is not to initially notify students of these opportunities since the SAO has already done that. Rather, we want to archive the types of internship and job opportunities that arise through the SAO. By attaching a link to the position announcements, students are given detailed, job-specific information. By reviewing the many jobs listed, students can get a general overview of job requirements they must prepare for – expected knowledge, abilities, and other desired qualifications.

2. "Scholarships" initially was intended to archive a list of available scholarships in the Business School, relevant dates, and contact information. However with a personnel change in the Student Affairs Office, that office put this information on its web site and continually keeps it current. Now, our web site generally explains the information the SAO has, and links to them. We also provide a link to their email distribution list sign-up web page. It is an important fact in allocating departmental resources to web development that our web pages have had to evolve as the rest of the campus and Business School web sites develop. Our web pages continually evolve with primary and up-dated information and links. Several of our department web pages have moved from collecting information as a secondary student source to linking to other primary-source web sites.

3. "Other Links and Information" is a catch-all for miscellaneous, interesting information that ties to the "financial support" theme. Currently, it has numerous links to job-search web sites – on campus (the CSUS Career Center) and off campus. It also provides another link to the Student Affairs Office email distribution list sign-up web page. A useful factor in linking to the Career Center web site is that our site goes into their site to the specific page of interest. Students do not have to interface the entire Career Center web site to get to the target information.

4. "Information about Planning Your Education for a Career" is currently empty. The department has not developed original information for it. In the future, given department approval, it may be filled in with links to professional organizations' statements on accounting and student-related topics, relevant research studies by professional organizations, and information about the professional certification exams that are important to accounting students.

5. "Events" archives Student Affairs Office announcements about events such are Job Fairs. The object is to give students an overview of the types of events they can expect to come up through the year. Again, students are advised that they must access the Student Affairs Office web site or sign

up for its email distribution list to get timely notice of what is actually occurring in the current semester.

6. "Information about Firms/Organizations Employing CSUS Students" was originally developed as a vehicle for providing information to students about firms that recruit accounting students on campus and the range of firms providing career opportunities. Hopefully, it could also be used to more closely tie employers to our department by, for example, providing information about them and links to their web sites. So far, the department has not developed this site beyond some partial data generated several years ago. This situation illustrates the critical relation between department leadership, faculty buy-in to the web site's importance and objectives, and designing and creating the information for a web site. A problem that blocks web site development in a setting such as ours is not technical capability or web technology that is beyond the reach of the department. In our case, one of our faculty members donates his services as the technical webmaster as part of his institutional service responsibility.

7. Links to other offices on campus are: "CBA Student Affairs Office", "CSUS Career Center", "Financial Aid Office", and "Cooperative Education Office". These are simple hyperlinks with no added explanation or descriptions. They round out the objective of providing a comprehensive overview of financial support and employment sources on one web page.

Administrative Information

Our Department's "administrative" web page contains basic identification and contact information for the Accounting Department chair and secretary: name, location, office hours, phone numbers, and email addresses. This illustrates what a web page should not be limited to if its potential is to be exploited. Our department has not developed significant information for its web page because of lack of time or appreciation of its potential for service to students. http://www.csus.edu/accy/frames/site-8.f.htm

Essentially, we believe the page should be an information desk with types of information and services that mirror information/service requests by the daily student traffic through the office: location-maps, directions of where to go and who to contact for services, forms needed by students that include campus or school policy instructions (these may have to be mock forms if the campus does not provide or accept online generated forms), etc.

1. To be effective and used by students, a search capability may be needed. In our department, this is not beyond our faculty webmaster's capabilities since the programming can be done in JavaScript. Alternatively, a well-designed tree structure of web pages may enable students to efficiently find links to topics, particularly when the number of information categories is relatively small and the concept is initially being developed and implemented. All of this is well within our existing "in-house" IT capabilities.

2. The "administrative" page we envision will require disciplined attention by the office staff – in particular the secretary. It is necessary for the department chair and secretary to accept and take ownership of this type of project – with design, development, and continual updating required. Major issues of departmental need, resource allocation, and sustained interest must be resolved.

We emphasize the "ownership" theme that occurs in many business fields. Behavioral and organizational issues are dominant for an information system to be accepted and effectively implemented. The technology of the information system may be critical, but often it is not the dominant issue. An underlying organizational culture and way of doing business make change difficult, as illustrated by the many organizations that change only when confronted with otherwise irresolvable crises.

The message for an academic department is that developing a web site requires technical resources. However, for the site to be first-rate, the department must structure the development project so that faculty and

staff accept it and work to provide information for it. The department webmaster should not hang on to the site as his/her project, but pass ownership to the department chair and faculty. As the owners and suppliers of information, only they can make the web site significantly effective in serving students.

Course and Instructor Information

This area is subdivided into four web pages: "program requirements," "instructor information," "course scheduling," and "course information." This group of pages attempts to provide students with comprehensive information about accounting programs of study, instructors, courses offered, and syllabi used by specific instructors.

"Program Requirements" includes details about degree programs – required courses in the concentration, electives, course-credit hours required, etc. There is a link to the University catalog where students can access relevant University information. However, we believe the goals of this web page should go beyond the delivery of catalog types of information to students. It could be further developed to include (●) suggested semester sequences of study and (●) the appropriateness of alternative programs for various professional goals (e.g., should I get a Masters of Accounting, a Masters of Tax Accounting, or a Masters of Business Administration?). It should include program advising, especially in that it answers frequently asked questions about program suitability for a student given career interests, capabilities, and time constraints. http://www.csus.edu/accy/frames/site-1.f.htm

"Instructor Information" is basically biographical information about our faculty. It includes general-interest information: links to universities where our faculty received their degrees, and links to organizations to which our faculty belong. For each faculty member, it includes his/her: teaching areas; research interests, publications, and consulting areas; professional memberships; office phone number; and email address. Given the complexity of information in the several areas of the department web site and the availability of faculty members' personal web sites, there is probably not much more that can be done to develop this web page. http://www.csus.edu/accy/frames/site-4.f.htm

"Course Scheduling" was initially a detailed list for an upcoming academic year (fall and spring semesters) of the courses our department had scheduled, including their times and locations. This page is another example of our web site's evolution as other campus sites improved. Now the University has complete listings of course scheduling information. Our page simply has a link to their page.

It is interesting to observe the importance of an authoritative mandate to web site development. When our department provided course scheduling information on its web page, information was less complete than the University has provided (e.g., it excluded the winter and summer sessions), information on our web page generally lagged the latest updates (course cancellations, room changes, etc.), and putting updates on our web page required the department webmaster to initiate contact with the department secretary in search of information. Now the University mandates timely updates through an interactive log-on program that the secretary accesses. The University scheduling information is generally always up-to-date.

To develop the most effect web site for an academic department, there appears to be merit in a superior academic unit (the school, college, or university) mandating the web site and setting minimum requirements. For example, the College of Business could mandate that scheduling information be placed on each department's web site and kept up-to-date. From our experience, the IT resources of the University (or a better-funded College are necessary to develop the software for online maintenance of web information by non-IT, office personnel. http://www.csus.edu/accy/frames/site-5.f.htm

"Course Information" contains course descriptions and a table that cross-references courses offered in a given semester with the instructors teaching them, with each cell giving links to the instructors' syllabi. Each course description includes: the catalog description, course prerequisites, the course's educational

objectives, content/topics covered in the course and the time spent on each topic, typical grade assessment methods used in this course, a list of professors who frequently teach the course, and a list of typical texts for the course. The objective is to present students with a broad enough range of information about a course so they can better choose elective courses and better plan the timing of when to take a course.

The course-instructor table and syllabi links help students know what a particular section of a course entails (content and coverage intensity, grading policies, project requirements, etc.). Previous semesters' syllabi for a course and instructor are kept on the web site until a current semester outdates them. Also, there are links to each instructor's personal web site, where a student may get more or missing information about a course to be offered or its syllabus.

This web page is fairly complete, except it either does not include or provide extended information about new or experimental courses. Also, only one-half to two-thirds of faculty syllabi are regularly provided to the web master for inclusion. http://www.csus.edu/accy/frames/site-6.f.htm

Conferences and Events

Academic department web pages serve many needs: students, alumni, colleagues, and professionals. This site can advertise conferences in which faculty members participate or that the School offers, although this is not a direct application of the student service/information theme. Additionally, the pages can be expanded to include professionals' and Accounting organizations' conferences or similar opportunities for students. In our particular case as an Accounting department, the domain of the site could be broadened to include Accounting student organizations' event schedules, information related to the timing and content of professional certification exams, and information relating to continuing education for professionals (information that helps students understand the need to learn-to-learn and topics that are of continuing interest to professionals).

Generating faculty interest and participation remains an issue in our department's development of its "conferences and events" page. This page has had only one listing - a taxation conference.

Faculty Web Pages

Faculty web sites can be working pages to serve students - an approach we advocate, or only information profiles about a faculty member – an element we would include as a less important part of the web site. As working sites, we conceive of faculty web pages as containing course web pages and topic-related information and links. We give examples of these approaches, where our purpose is to highlight alternative approaches for those designing academic department web strategies. The examples we use are public information available on the web without password protection, and we do not evaluate them as good or bad.

1. One of this paper's authors has the following web site: http://www.csus.edu/indiv/b/brechthd . It is made up exclusively of links to courses the instructor is teaching in a current semester. For a course, one link is to the syllabus. A second link is password protected, and goes to detailed information supporting the course – an online grade book; the textbook's online solutions manual and test-bank questions; and a bulletin board with exam solutions, links to online research studies, etc.

2. One of the authors' colleagues has the following web site: http://www.csus.edu/indiv/o/ogilbysm . It is made up exclusively of links to pages for courses the instructor is teaching. (This approach predominates for our colleagues personal web sites.) The pages include PowerPoint and html pages with lecture slides. Thus, to some degree, the instructor's lectures are reproduced on the web. All of these pages are without password or enrolled-student protection.

3. The following web page illustrates "snapshot" summaries profiling a faculty member: http://www.kellogg.nwu.edu/faculty/bio/balachan.htm . The categories are: courses/topics taught, career and recent professional awards, teaching awards, professional leadership, research areas, current projects, representative publications, and general/consulting. Such profiles may be within the department's web site (as is the case here) or on the faculty member's personal web site (as shown in example #4 below).

4. The final example we give is a personal web page: http://faculty.smu.edu/barr . This faculty member and department chair's web site provides: contact information, summaries of his current research, downloadable papers and presentations, course-information summaries for the various courses taught, detailed information about his various professional activities, a listing of business and consulting activities, and limited personal information (where born, wife and kids, etc.). So far, the web pages present an information profile about the faculty member, with limited information about the courses taught.

What sets this fourth web site apart is it also has links to pages of particular interest to students – pages that are academic topic/content and student-interest related. For example, (•) there is a link to a question and answer page on linear programming topics (a mathematical technique taught in an engineering school), (•) there is a link to an available software and software-performance information page to help identify solutions for mathematical optimization problems, and (•) there is a link to a computing society concerned with topics of interest in the management sciences.

We propose an "ideal" model for the way a faculty member designs a personal web site as some composite of the above examples. Additionally, we think question and answer pages and topic-support pages for the current semester's courses are particularly valuable to current students and possibly to recent graduates who have entered the workforce. We understand why "proprietary" course information may be password or enrolled-student protected. Also, we realize the value to an academic department and faculty member of providing information about faculty members' research areas and papers, current projects, consulting experience, and representative publications.

Web Courses

In Accounting, our web courses provide students with information in six basic areas: syllabus, topic and assignment materials, lectures, projects, exams, and the course grade book. Web techniques for information delivery and instructor-student communication include the following.

- pages posted to the course web site;

- responses to individual students through emails;

- clarifications and explanations posted to the web site – a group discussion/response, bulletin board type of system;

- discussion through a chat room – office hours or class/group discussions;

- discussion through audio/video streaming – class discussion; or

- interactive program or file coverage of a topic - purchased by the student or delivered on the web.

What we have experienced is that each faculty member experiments with different technologies, and what a faculty member uses is dependent on his/her technical skill and interest. In a non-IT academic department, Accounting in our case, you cannot mandate web-course/faculty assignments and technology. The possible resource-faculty matches do not give room for maneuver. We have faculty that use audio/video streaming courses, courses limited to using only web pages and email, courses that use the web with on-campus exams and office hours, and courses that use WebCT including its timed-exam capabilities.

Using the Web to Serve Students

On our campus, all web-course technical resources are provided at the campus level; and there are no budget charge-backs to the academic department. Computer-based resources are free and of "unlimited" supply. The faculty member only needs to be interested and access them. An exception is the faculty member using audio/video streaming. Free or low-cost commercial providers are used, not the campus resources that are more limited.

Pages posted to the web for student, one-way consumption are an obvious way to send information. These pages convey information about syllabi, topic and assignment materials, lecture notes, project assignments, and grade books. Added to this, email provides individual attention and dialog between faculty and student. We have found that this is the first technical level on which web-course instructors enter into offering web courses. WORD, EXCEL, and POWERPOINT simplify creating web pages, and make them possible for almost all faculty. The only challenge is to get the web pages up on a web site and to design the site. OUTLOOK is a good email program, and it interfaces well with Microsoft OFFICE's programs. Other more complex web technologies are available on our campus, but require more IT knowledge of the instructor.

1. For real-time dialog between instructor and students, chat and audio/video streaming are available; but they are problematic. Difficulties include communication delays involving geographic distance, server throughput speeds, and dsl/non-dsl connections. Questions and comments lag each other; therefore, comments are occasionally off the current subject of discussion. Any given participant's screen may not be at the same point in messages received/sent as other participants' screens. Also, students' feelings of anonymity allow comments to float off-subject or to follow the timing of an individual student's comprehension rather than the more-dynamic movement of the discussion. In effect, an instructor and a systems operator are needed. The operator screens and prioritizes student input. Chat software that allows operator intervention is difficult to obtain, and such off-the -shelf software may not exist. Our faculty member who works with an audio/video web course has found the necessary software, but still has to use the two-person system.

2. It is also possible for an instructor to write an interactive program on a topic that a student can query and alter the information-delivered content and coverage sequence. For example, we have written an EXCEL workbook that we view as a comprehensive tutorial of a particular topic at an introductory-to-intermediate level. The xls file has numerous support files, and additionally uses WORD and POWERPOINT. We intend that a student can access and execute this xls file consistent with his/her level of study, interest in various aspects of the topic, and times that are convenient. We have yet to deploy the system, with issues remaining of whether it can be server-sided using our campus web server (i.e., the xls file accessed and executed on the web), or whether the files must be executed on students' computers (i.e., the files downloaded or otherwise provided to students, perhaps as email attachments, and the master xls file run from EXCEL). Alternatively, an instructor could write an executable program that provides topic deliver and interactive dialog and topic sequencing between the program and student. It may be that our campus-wide system does not allow executable programs on its faculty/course web server, so a commercial service would have to be used for this purpose. In an academic department such as Accounting, it is unlikely that faculty will allocate their time to write such a program.

Commercial software packages are becoming increasingly available. For example, Prentice-Hall Publishers offered a US $25 CD to students that covered numerous Cost Accounting issues. The CD included short movies tying cost accounting subjects to practice requirements in the profession, and it had six case studies. Harvard has several business simulations for student purchase at about US $25. These software CDs have movies, "lecture" screens, an interactive simulation game, and screens that can be printed. In Accounting, many textbook publishers are establishing textbook web sites with an ever evolving range of student-accessible resources. Moreover, within two years the Certified Public Accounting (CPA) exam

will be computer-based and include simulations. Commercial products will undoubtedly follow this lead and offer relevant software to prepare for the CPA exam.

1. The issue for a web course is how to use such software. Of course, the software is not unique to web courses, but is targeted to all courses – campus and web. We think its value is to give all students a shared experience – a behaviorally enriched set of lecture material, movies, and games. One of our instructors uses the Harvard Balanced Scorecard Simulation for these purposes in his web course. It gives all participates a common reference of facts and simulation experience for capstone discussion. In effect, rather than learning being classroom-dialog dependent, well-written software moves the learning to an at-home, student-software experience.

2. In accounting-related topics, there should be an increasing supply of commercial software that augments courses. It does not uniquely serve the web course, but it promises to take some of the learning difficulties off the online portion of the course and thus minimize pedagogical difficulties with web courses. For instance, how do you teach a case-discussion course online, given the difficulties with web chat and lesser but similar difficulties with audio/visual streaming? How do you avoid resource-access, faculty-interest, and budget constraints on two-person staffing of audio/visual streaming web courses? Interactive case software can be written by the instructor, but commercial case products would provide greater access to more faculty – and thus to their students. Such software does not make the online discussion better, but it moves much of it to the student-software interaction and minimizes the discussion weaknesses of web technology.

Administering exams presents difficulties with no obvious solution. Our faculty has not reached a consensus on how to examine students.

1. Some of our faculty have given web-course exams on campus. This controls to insure that learning is measured, but it defeats the convenience/timing expectations of some students and thwarts geographically distant enrollment in the course. Our central administrators for web courses discourage, but do not prohibit, such exam policies.

2. Other faculty give exams as online, "take-home" exams. The exam is delivered to the student as a web page, and returned to the instructor as an email attachment. This approach satisfies many convenience expectations of web students, but risks not measuring, and thus not motivating, learning. One of our instructors minimizes this risk by shifting more of the course weight to work performed during the course. That work emphasizes evidence of topic coverage and in-depth study. For example, the student generates true/false and multiple choice exam questions that cover all key points in the text; homework is thorough and much of it is exceptionally challenging; and projects require in-depth study and performance for highly focused topics.

3. Other faculty use WebCT for online, timed exams. However, these are inherently open book, open notes, and helpful friends can be in the room with the student.

4. We believe that examination difficulties best illustrate the negative concept that web courses treat students as information clients rather than reliably creating learning or teaching them to learn to learn. A weak or unmotivated student may be better able to "get by" in a web course. S/he must evidence topic coverage and information consumption rather than the deeper accomplishment of learning. Superior students are served in convenience and course availability, and their awareness and motivation minimize any harmful non-learning. Accounting professionals illustrate this type of student – such as Certified Public Accountants who need to expand their career knowledge. We think that department faculty must understand the target audiences for web courses, and take this into account when offering such courses and committing educational program resources to them. For example, a low level, survey course may be readily offered with all class interaction being

over the web. A gradate case discussion course may require audio/video streaming, second-person staff support, and generally more technically capable faculty.

Other problematic issues associated with treating students as information clients in web courses are focused by the following question: Can students learn professional behavior and develop teamwork and communication skills if key courses that develop these attributes are web-based? We think the answer must be "no" where these attributes are learned by personal contract and observation. The web methodologies outlined above exclude observation of a professor's, outside speaker's, or other students' demeanor and interactive discussion skills; assimilation of an atmosphere/class-culture that exhibits professional values; many of the behavioral dynamics and learning of people skills that occur in face-to-face group project interactions; and the observation and practice of speaking/presentation skills. Perhaps televised courses, or some equivalent quality of web technology, achieve these behavioral learning objectives; but we think the visual interface should include all parties in a classroom experience. These types of issues seem problematic for web courses, particularly considering the diversity of abilities and motivations of web students, the limitations on faculty IT capabilities and interest, and the types of resources available to an academic department such as ours.

Conclusion

We draw conclusions in four areas. These areas involve developing a web strategy for an academic department and our needs for IT research.

1. We find that it helps instructors exploit the web's strengths and avoid its weaknesses to view web courses as based on an information-client relationship between students and the subject material. This perspective is particularly important in selecting courses to be offered on the web and in targeting student markets. For this analysis, we consider the web technology used as similar to what a web-course tool such as WebCT offers: chat, web pages, a bulletin board, and timed online exams.

   A web course can involve students consuming printed information, with learning limited to self-study of the information and the successful completion of "take-home" exams or projects. More in-depth learning objectives that involve face-to-face communication and involvement in the dynamics of classroom exchanges can be lost. A clear example is a case discussion course.

   We conclude that:

   - Departments should carefully consider the pedagogy used in a course and the course's learning objectives. Depending on the computer technology used, the department may decide not to offer some courses on the web and to offer others. Thus, web courses are used to strategically supplement course scheduling.

   - Regarding students targeted for web courses, departments should consider their learning needs and potential weaknesses. For example, web courses seem well suited to highly motivated, competent students who are likely to achieve the course's learning objectives. Working professionals and graduate students seem to meet this profile, and the web opens easy-access course enrollments to them. Alternatively, in-residence undergraduate students may not be sufficiently motivated or educationally mature enough to take full advantage of web opportunities to learn. This view is, of course, highly dependent on the student body at a particular university (e.g., a private school versus a state community college), the particular course-subject involved (e.g., math as opposed to business law), and a student's educational stage (e.g., an advanced elective versus a core course).

2. In our department, it has been easy to engage a number of faculty in teaching web courses and having web sites. This has occurred even with significant variations in faculty members' com-

puter background and IT capabilities. However, for the department web site, it has been very difficult to progress beyond its initial development - to keep the information on the site expanding and up-to-date. We think this has occurred because the site was designed and developed by one faculty member in liaison with the department chair (who had review and approval authority). The faculty never invested itself in or took ownership of the site – purpose, design, or content.

We conclude that:

- Web development for an academic department has various stages that are seen with various types of information systems requiring management acceptance in design and implementation. A web site's initial design and development may be controlled by a very few people, but the wider faculty must become invested if it is to continually develop and draw information and ideas from other faculty members.

- A possible approach for a web site to enter a more mature, advanced development stage is to have a web committee of heavy users of technology and teachers of web courses. This "project group" might be chaired by the department chair or a faculty member other than the webmaster. In our case, the web master would be an important member of the committee and a faculty colleague of the other committee members. The webmaster would not own the web site, but serve in more of a technical staff capacity and as another one of the contributing faculty.

3. A direction for IT research that we would find useful is case studies that address web strategy in university educational settings. We would find value in case studies dealing with organizational and behavioral issues in the context of web site or web technique design and implementation. We believe that we have identified a fairly wide range of issues and problems we have encountered in our academic department. Knowledge of other people's experiences and their success or lack of it would help our progress. In Accounting, case studies are published in education journals such as Issues in Accounting Education.

4. We would also find IT research useful that develops software for student-on-computer learning. Such software may be delivered to and worked with interactively by students over the web, or it may be free-standing software that executes solely on the student's computer. To the extent that students can work interactively with topically enriched software, the burden of trying to teach over the web, simulating a classroom session, is lessened. Through student-software interaction, the software provides students with an educational experience tailored to their needs and interests or those the instructor dictates as educational objectives. A web-delivery weakness in student-on-instructor or student-on-student interaction is a pedagogical weakness in web courses. We think that software could finesse these weaknesses.

Biographies

Thomas J. Beirne is a Professor of Accounting at California State University, Sacramento, USA with over twenty-five years experience teaching financial accounting. He is a co-author of a paper presented at the Western Decision Sciences Institute's Maui 2000 Conference that presented a software tool for supporting student self-study and learning. The tool is based on Microsoft Office programs (using an EXCEL spreadsheet at the anchoring file), and gives students a single, integrated topic-study platform. It provides tutoring, terminology and concept definitions, and gateways to more advanced topic study found within the platform and at general web-link destinations. Professor Beirne also has his own web site, and has used the web to enhance his accounting classes.

H. David Brecht is a co-author of the WDSI Maui 2000 paper, and has taught many web courses and web-enhanced courses. He also has teaching experience with WebCT, but now uses his own web site for teach-

ing web courses. He is the webmaster for and designed, developed, and programmed the Accounting Department's web site. He has confronted and has experience with all of the issues discussed in this paper.

Eugene H. Sauls is a co-author and presenter of the WDSI Maui 2000 paper. He is the past Chair of the Accounting Department at the authors' university, and was the Chair (with review and approval responsibilities) when the department web site was designed and developed. He has worked with many of the major, department-level issues discussed in this paper.