Reengineering Curricula for Tomorrow’s Students  
- Redefining the Faculty Development Center -

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Abstract

Teachers trained today will educate students raised with technology-internet research, immediate information retrieval, online communication and business transactions. They will expect information available 24x7 and a high degree of responsiveness from academic institutions and instructors. The charge for tomorrow’s teachers will go far beyond PowerPoint and LCD projectors. To prepare teachers for tomorrow’s students, Drexel University is expanding its Faculty Development Center to accommodate both the needs of teacher preparations students and the demand for more online courses for our students. The goal is to educate aspiring teachers to engineer academic content using sound pedagogical and instructional design creating curricula meeting student needs. Drexel faculty will work with teacher preparation students to use a variety of technologies: course management systems, discussion groups, audio, video, graphics, testing applications, and new technologies to design online curriculum. These new curricula will accommodate a variety of learning styles, content demands, and will employ technology and resources effectively and economically.

Preface

Today’s students at all levels of the educational system expect to have access to information they need 24x7, whether it be administrative services, (i.e., status of a tuition bill), transcript information, or academic information, (i.e., course content and assignments). Drexel University has traditionally been a leader in providing technology access to students, faculty, and staff (i.e., Drexel was the first University to require personal access to a microcomputer in 1983 and had the first entirely wireless campus in 2000). Drexel has also been aggressive in providing remote access to vital academic and administrative information to students, faculty, and staff over the web (i.e., single sign-on Portal, mobile access, fully integrated Enterprise System (ERP), and Course Management System (CMS)).

Implementation and integration of the Portal, ERP, and CMS core applications is complex and managed and supported by the Office of Information Resources and Technology (IRT). WebCT is fully integrated with the SCT Banner ERP system and Portal and, as a result, provides built-in access to CMS functionality for all core traditional undergraduate and graduate academic courses.
Background

Web-enabled course development began on a one-on-one basis with the Office of Information Resources and Technology (IRT) /Instructional Technology Support Group (ITS) responsible for organized training and support services available to faculty. Interested faculty from all disciplines were encouraged to make use of WebCT to provide web access to course materials and testing, and to facilitate course-centered collaboration. There were minimal incentives provided to faculty and no directive or university policy mandating or even encouraging web-supported course development. Essentially, faculty involvement was a result of individual curiosity, initiative, and creativity.

IRT’s Instructional Technology Support group assigned a small number of staff (on a rotating basis) to what is known as the Faculty Development Center (FDC) to support faculty in the use and integration of WebCT functionality in course materials and delivery. IRT Instructional Technology Support staff includes html skills, multimedia skills, instructional design knowledge, pedagogical expertise, training expertise, and in-depth WebCT skills. This group provides an excellent full day WebCT boot camp for faculty interested in getting started. They also set up mentors for faculty to work with, establish a help email account, and ongoing support – both during course development and course delivery. They are responsive and knowledgeable and have provided great benefit to faculty. Further, this group is always exploring add-ons and peripheral tools and applications to enhance the available WebCT tools. Development of web-supported courses, however, was done on an ad hoc basis across disciplines and was optional for faculty. In addition, while educational technology courses were included in the teacher preparation programs, there were no courses dedicated to designing and developing web-based courses.

As interest and demand for web-enhanced courses and online courses increased, many issues emerged requiring the University’s attention. Drexel is a co-operative education university meaning that all students spend three six-month cycles in the paid professional employment of a business or industry. This is a requirement of virtually all majors and is a key distinguishing characteristic of Drexel University. Thus, at any given time, half of the undergraduate student body is “out on co-op” which usually means they are off campus somewhere locally, nationally, or worldwide. Students on co-op have requested the ability to take courses while they are working. Thus, demands for fully online courses have increased. Decisions regarding how many online courses can be taken by a traditional undergraduate, what is the definition of an online course, and how to maintain educational standards and pedagogical integrity while moving online are just a few of the issues the University is facing.

The Faculty Development Center

The Faculty Development Center (FDC) was established in 1984 to support faculty who were learning to use the microcomputers they and their students were required to have. Drexel had been the first major university to require its students to have “personal access to a microcomputer” and had received a major grant to prepare faculty to integrate this new technology into their courses. The Faculty Development Center was operated and supported by the then Office of Computing Services (now IRT) and was a resource room providing support staff, peripheral equipment, new software, training, and a safe refuge for faculty to be creative and innovative with technology and their curricula. Over time, the FDC has changed a bit—with more technology resources for faculty, greater support for pedagogical redesign, more outreach to departments to stimulate interest, and providing training and forums to share and showcase what faculty have accomplished. The adoption of WebCT has made the FDC a “single point of contact” for all web-related and online course development services. However, as the interest and demand escalates and the need for course redesign and reengineering is more imperative, the scope and role of the FDC will again change to accommodate the need.
The FDC will be expanded to both support Drexel faculty in developing web-supported courses and to prepare students in our K-20 Teacher Preparation program. However, it will be open to and have programs for teaching assistants, practicing teachers, corporate trainers, and other constituents as well. The FDC will aggressively seek new constituents to participate in the program. While there will be University policy changes and curricular initiatives setting some goals and milestones, IRT will evolve markedly in anticipation of many changes and challenges and in response to these developments. While the goal is to establish a well designed, comprehensive, thorough approach to infusing and integrating technology into the entire curricular design and teaching process, reality indicates that evolution and ad hoc actions may precede or accompany such a plan.

Changes in Teaching and Learning

The use of technology to enhance learning covers a huge continuum, from the simplest non-electronic technologies, such as paper and pencil and chalk and a chalkboard, to the most sophisticated “smart classroom” or “smart environment”. However, the rapid societal transformation based on electronic access has had an extraordinary impact on the immediacy of interpersonal communications and information delivery. The students of tomorrow will bear little resemblance to today’s students when it comes to the use of technologies for communication, personal productivity, research, and information access.

The challenge is to provide tomorrow’s teachers/professors not only the understanding and appropriate use of technology itself but the implied pedagogical /andragogical transformations that should occur in education itself. There are many academic Institutes and Centers that focus on training and education in e-learning environments, but they attract the early adopters within faculties and often do not provide the pedagogical analysis and design instruction necessary.

Current Status of Courses using WebCT at Drexel University

Over 200 faculty have been trained during the last calendar year in the use of WebCT bringing the total to around 400 Drexel faculty. This continued faculty support and training has resulted in almost 1500 “Parent” courses (template courses where content is developed prior to moving to a specific term’s course offering) – more than doubled from the previous year. (We also host and support WebCT for partner schools and course growth continues at Neumann, Cabrini and Rosemont with nearly 100 courses online for each. Recently the Philadelphia College of Osteopathic Medicine was brought online under WebCT and they are just beginning to offer courses (6 so far). Finally, Wilkes University has just been brought under our WebCT umbrella. Initial training for their faculty occurred in early January, 2004, with the delivery of online courses following shortly thereafter.)

It is difficult to give exact numbers of course usage in WebCT since once a faculty member is trained; there is no requirement to create either parent courses or to notify IRT as to usage since class accounts are created automatically via the integration with Banner. Essentially ALL courses are WebCT-enabled with automatic population of Banner course/student data and can be used without any intervention by IRT staff.

An analysis of student usage in all Drexel courses beginning with the 2003-01 term continues to show that just over 60% have had some student WebCT activity. Again this is difficult to monitor, but on any given day, more than 4000 unique users (faculty and students) log in to WebCT.

These courses contain various amounts of faculty-provided content. Students can access the course shells either to collaborate with other students via WebCT’s coursemail feature or discussion area. Many courses have substantial content provided by the course instructor.
Of the active WebCT-enabled courses offered at Drexel, most are in support of existing face-to-face classes (~60%). The next largest category, 30%, are what are generally referred to as “hybrid” courses – courses that have gone through significant pedagogical changes in delivery modalities and typically have some fully remote students. Finally, the last 10% of the WebCT-hosted courses are fully web-enabled. For example, the Masters of Engineering Management program is fully web-enabled (16 courses); their first entirely online cohort began 2002-02.

**Some additional insights concerning the use and growth of WebCT based online courses.**

- In reviewing parent course statistics for the past 3 ½ years of WebCT’s use, we find that the number of parent courses continues to nearly double each year. This growth is a result of demonstrating and inculcating among the faculty the value and use of WebCT and, since the number of parent courses is an indicator as to the number of actual online course usage, we can expect the use of WebCT-enabled courses to grow accordingly each year. Also, the ease of access through the automatic integration with the DrexelOne portal will continue to promote the adoption and expansion of online content-enriched WebCT-hosted courses.

- 20% of the active online courses use some kind of audio or video enhancements, such as astronomy, engineering management, communications, and organizational behavior. This a/v takes the form of voice-over Power Point for explanation/enhancements (couldn’t come to class—recorded and put on line for students), converted digital or analog video/audio content and/or streaming lecture content.

- In support of developing “hybrid” courses and as a means for creating online content for fully web-enabled courses, IRT’s Web Group captures over 30 hours of live class lectures per week. Most of this content is broadcast live to remote students but all content is also archived on a streaming server and links are added to the appropriate WebCT enabled courses so that those lectures can be viewed or reviewed anytime/anyplace. An example of this is Dr. Frank Linnehan’s ORGB300 – Organizational Behavior class (250 students) - which is captured each week and made available via the online course to all enrolled students. These streamed lectures are normally available in these WebCT courses on the first business day following the lecture itself.

**Participation in Pew Funded Project in Course Redesign**

Parallel to the continuing ad hoc development of web-enabled courses, the University was invited to apply for a grant offered through the Center for Academic Transformation (CAT) funded by the Pew Foundation. The three year project on Program in Course Redesign would fund academic “reengineering” efforts in 30 schools throughout the country. The goals of the project were to take large subscription courses and redesign them, putting materials online and restructuring traditional class meetings to reduce costs, improve academic quality, and make exemplary use of technology.

“The Program in Course Redesign has collaborated with 30 institutions to demonstrate how colleges and universities can redesign their instructional approaches using technology to achieve cost savings as well as quality enhancements. Redesign projects focus on large-enrollment, introductory courses, which have the potential of impacting significant student numbers and generating substantial cost savings.”

http://www.center.rpi.edu/PewGrant.html
The Program in Course Redesign created tools for schools to use in the process to determine the institution’s readiness, the course readiness, and to estimate the current costs of delivering the class as well as projected costs and cost savings if the class were re-designed using the web and related technologies to deliver information and instruction.

After a lengthy and rigorous review process, Drexel received a grant to redesign introductory courses in Computer Programming. Virtually all Drexel students take Introduction to Computer Programming in some flavor; many drop out and take it again, and it is an expensive but integral course in the majority of our academic programs. The goal was to create online content modules which could be selected based on the student’s major and the programming skills necessary for that major. Students could “test out” of modules and customize their programming course based on their skills and their academic requirements. Face-to-face lecture classes would be replaced by lab sessions in which students could work in groups on programming assignments in a specially designed wireless laptop classroom and could receive special assistance.

Below is a table representing the projected savings of the 10 schools funded along with Drexel in the third and final year of the project. The Project in Course Redesign sought to demonstrate that schools could provide courses which were more accessible to students, designed to address specific learning needs and styles, improve the academic experience of students’ while making better use of resources and reducing costs as well.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Course</th>
<th>Cost Per Student</th>
<th>Savings per %</th>
</tr>
</thead>
<tbody>
<tr>
<td>U of S Mississippi</td>
<td>World Lit</td>
<td>$70</td>
<td>$39</td>
</tr>
<tr>
<td>Northern Arizona U</td>
<td>College Algebra</td>
<td>$138</td>
<td>$65</td>
</tr>
<tr>
<td>U of New Mexico</td>
<td>Psychology</td>
<td>$72</td>
<td>$34</td>
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<tr>
<td>Iowa State U</td>
<td>Math</td>
<td>$129</td>
<td>$54</td>
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<tr>
<td>Drexel U</td>
<td>Computer Prog</td>
<td>$172</td>
<td>$72</td>
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<tr>
<td>Tallahassee CC</td>
<td>English Comp</td>
<td>$252</td>
<td>$107</td>
</tr>
<tr>
<td>Brigham Young U</td>
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<tr>
<td>Florida Gulf Coast U</td>
<td>Fine Arts</td>
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<td>Ohio State U</td>
<td>Statistics</td>
<td>$190</td>
<td>$58</td>
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<tr>
<td>Portland State U</td>
<td>Spanish</td>
<td>$178</td>
<td>$50</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td></td>
<td><strong>41%</strong></td>
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New Initiatives in Web Course Development

Today’s students expect increased experience with online courses. The University is faced with space considerations, interest in better use of faculty resources, and commitment to increasingly integrate technology into the academic program in innovative ways. The University is committed to ensuring that all students, graduate and undergraduate, will be able to have extensive experience with online education.

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The Provost created an eLearning committee in the fall of 2003 composed of academic representatives from each of the eight colleges and schools comprising the University and including members of the administrative and support offices related to eLearning (Office of Information Resources and Technology, Student Records, Office of General Council, Student Disabilities Office). The charge of the committee was to gain and understanding of current initiatives in each academic area and establish policies related to increasing the number and extent of online courses available to traditional students.

Weekly meetings were held beginning in October 2003 and each academic area did a brief presentation describing their programs and any online components of those programs. The Office of Student Records discussed how courses are listed and identified for students in the administrative system for registration and the Office of General Council presented information on the Teach Act and its role in using copyrighted information on the web.

Beginning in 2004, the committee is working to establish a policy to ensure that each student can take at least one online course per term, whether the student is a graduate or undergraduate. This policy is in response to undergraduate student demand (primarily), mostly from those out on their co-op experience, for greater access to online courses. The challenge now is to develop courses to meet the pent up demand while assisting faculty in this development to use technology appropriately and maintain and ensure high academic quality.

Next Steps: FDC Support for Course Redesign Imitative

The FDC will reorganize itself to provide extensive course redesign assistance and will work closely with faculty in the School of Education to accomplish this. Faculty and students in the School of Ed will be included in development “teams” which will be organized to assist those working on course redesign. Such a development team will include a WebCT expert, an instructional design advisor, a technology/media specialist, and the faculty content expert. Working together, the members of the team will ensure reliable and consistent content, effective, creative use of technology, and adherence to sound teaching and learning principles. IRT will sponsor a 2-day training institute for faculty during the summer to enable them to use WebCT, share development ideas with others, and create the team that will work on their courses. Faculty will receive training and intensive one-on-one assistance with course development and will be introduced to related applications, such as eFolio, ReadingList Direct, Wimba, and other tools available to enhance WebCT course delivery.

The focus of the Faculty Development Center at Drexel will be expanded and will be twofold: first, it will be redesigned to assist Drexel faculty in developing online courses in support of the University policy that each student will be able to take one online course per term, and, second, it will facilitate preparing prospective classroom teachers to deliver information and instruction using various technologies to accommodate and support learning modes and technology astuteness of tomorrow’s K-20 students. Teachers at all levels must be prepared to understand how students who have grown up with computers, the web, PDAs, instant communication, and good customer relations learn how best to take advantage of technologies to enhance the learning process and complement individual learning styles.

While the Faculty Development Center is part of the Office of Information Resources and Technology, it regularly involves key staff and expertise from other areas. An example is the close working relationship established with the Office for Students with Disabilities. IRT and Disabilities will cosponsor seminars for faculty and web developers on campus to promote the design of web pages and online materials complying with ADA standards. The School of Education faculty will be included in training sessions and the development of support materials to assist faculty in applying sound pedagogical principals to all
redesigned courses. Students in the School of Education will work with faculty on their development team ensuring pedagogical excellence.

The goals of the Drexel Faculty Development Center will be expanded to include: (note the term pedagogy below will refer to both pedagogy and andragogy):

Knowledge Building

1) review the research and “schools” of thought concerning learning pedagogy and the impact of technology on these pedagogies
2) review the range of teacher-centric thru learner-centric pedagogies and the impact of technology on these pedagogies
3) review the implications of learner styles and research the impact of technology on these styles
4) survey technologies as to their appropriateness and value-added in the education environment
5) review and assess the technology preparedness of typical learners and how they will perform with both traditional face-to-face and e-learning pedagogies
6) review the technological preparedness of typical facilitators, instructors, faculties, and other knowledge workers responsible for teaching and learning

Pedagogical Transformation

1) recast instructional pedagogies in an attempt to accommodate the instructional environment, instructional purpose, the technological sophistication of both learners and instructors, and the availability of technology
2) recast instructional design as it relates to appropriate and available technology when applied to instructional pedagogy

Faculty Transformation

1) provide pedagogical transformation tools and approaches for faculty depending on their teaching environment, availability of technology, technological sophistication, and educational goals
2) instruct faculty in pedagogical reengineering that is precipitated by the introduction of technology
3) instruct faculty in appropriate technologies and provide them an opportunity for testing reengineered curricula

During the spring of 2005, an assessment plan will be developed and will be administered during the fall 2005 term. Drexel will assess student performance, student satisfaction, economies, and faculty satisfaction related to online course delivery support. After the assessment is complete, necessary adjustments will be made in the program prior to repeating the course redesign project cycle for the 2005 academic year.

Drexel expects that web-supported and online course development will continue and be rigorously supported, and that this formal, well-organized approach will result in significant improvement in the academic experience for all Drexel students. Specifically, students in our teacher preparation program will have unique opportunities to apply what they have learned in order to assist with the redesign of the University curricula while working within the CMS framework and other related technologies in order to enhance their own academic program and prepare for their future work in our schools.