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Changing the Face of Traditional Education:

A Framework for Adapting a Large, Residential Course to the Web

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Abstract

At large, research universities, a common approach for teaching hundreds of undergraduate students at one time is the traditional, large, lecture-based course. Trends indicate that over the next decade there will be an increase in the number of large, campus courses being offered as well as larger enrollments in courses currently offered. As universities investigate alternative means to accommodate more students and their learning needs, Web-based instruction provides an attractive delivery mode for teaching large, on-campus courses. This article explores a theoretical approach regarding how Web-based instruction can be designed and developed to provide quality education for traditional, on-campus, undergraduate students. The academic debate over the merit of Web-based instruction for traditional, on-campus students has not been resolved. This study identifies and discusses instructional design theory for adapting a large, lecture-based course to the Web.

Keywords: net-based pedagogy, web-based instruction, large course design, instructional design, instructor support, e-learning

1. Introduction: A Framework for Adapting a Large, Residential Course to the Web

As university enrollments continue to rise, instructors must consider alternative delivery modes to the traditional, large, face-to-face (FTF), lecture-based instruction commonly seen at research universities. As the use of electronic technologies in higher education also continues to grow, universities constantly seek ways to use on-line tools to deliver instruction as the technological infrastructure expands in terms of its capabilities and power (Boettcher & Conrad, 2004)(4). As alternative instructional delivery options are implemented, there is a need for detailed guidelines to support learning in these new environments.

This study explored alternative instructional modes for teaching a large, introductory computer course at a traditional, residential university. By creating additional Web sections, enrollment in the course could grow exponentially eliminating the need for the University to provide additional physical space to accommodate the growing student population.

Studies indicate that taking an existing FTF course and simply publishing course materials into a Web-based environment will not necessarily provide the foundation for a well-designed course. The course must be adapted to the environment to take advantage of the technology available (Carlson & Everett, 2000)(8). To date, a comprehensive list of strategies and/or guidelines for adapting large courses to a Web-based instructional environment designed for traditional, residential campus students do not exist. To accomplish this goal, we must consider whether we are merely moving beyond conventional boundaries of the traditional, residential classroom or if we are attempting to create new teaching and learning opportunities and progressing beyond current pedagogical thought. Within this new technological environment, the possibility exists to challenge traditional educational methods and push the limits to establish new teaching and learning standards appropriate for today's technology (Berge, Collins, & Dougherty, 2000)(2). Adapting a course to the Web provides opportunities as well as numerous challenges for the instructional designer and instructor (Bonk, Hara, Kirkley & Dennen, 2001)(7). New delivery media and advancements in technology may alter the environment in which teaching and learning take place; however, the goals remain the same: to meet the needs of the learners (Palloff & Pratt, 2003)(14). When working in the Web environment, instructors must consider the need to develop basic guidelines for adapting instructional methods to meet the challenges imposed not only by new university demands, but also by the new delivery systems.

2. The Study

This study was an initiative by the Computer Science Department at a large, Midwestern university to incorporate Web-based instruction as an alternative delivery mode for a large, traditional, lecture-based, residential, undergraduate, introductory computer course. All undergraduate students from the College of Arts & Sciences and University Division (undeclared majors) were required to pass the course. The competencies learned in the course provide the necessary preparatory skills for students entering professional schools, departments, and programs throughout the university. Existing university lecture hall facilities were inadequate to accommodate additional course sections and increased class size. Therefore, it was necessary to investigate alternative instructional delivery modes. In the traditional FTF sections of the course, students developed an understanding of the information systems concept and the objectives and concepts of the information field. Microsoft software applications were taught in the lab.

As the Course Coordinator for the course, this researcher was asked to design and develop a Web-based version of the traditional, residential course, which would support the current goals and objectives of the traditional FTF course. The purpose of the study to was to develop an instructional design theory for adapting a large, lecture-based course to a web-based instructional environment. The designed case study approach to develop a new theory was carried out utilizing Reigeluth's and Frick's (1999) formative research methodology. A theory was developed in parallel with the initial version of the course, which

were developed based on trial and error, expert knowledge in the field, and a theoretical evaluation of the literature. At the end of the first iteration, data was collected and analyzed; changes were made to the existing course and to the theory. This same process was repeated again to complete the final steps of the formative research methodology. The goal of this article is to describe the theoretical position through a synthesis of the literature used to develop the theory.

Research advises faculty that teaching and learning methods should be adapted to take advantage of the Web's interactive capabilities when putting an existing course on the Web. Consensus among educators maintains that instructional materials cannot simply be transferred from one delivery medium to another, but rather need to be adapted to the interactive environment (Schmidt & Tak, 2002; Bonk & Dennen, 2002; Bichelmeyer, Misanchuk, & Malopinksy, 2001)(17)(6)(3). Little attention has been given to the pedagogical challenges and issues encountered when adapting a large, lecture-based, residential course to the Web.

Certain courses in a traditional university curriculum may adapt more easily to the Web than others. According to Twigg (2003), the large lecture-based course should be considered the ideal candidate for web-based instruction, as they generate the highest return on investment. Unfortunately, these courses are often overlooked by administrators and smaller classes are considered as the best choice. Generally, large lecture courses are offered at the introductory level for non-majors with classes ranging from 250 - 500 students per section (McKeachie, 2005)(13). There can be fundamental pedagogical issues confronting the large course lecture format such as a single instructor teaching in the traditional lecture format; "the sage on the stage" approach. Frequently, there are accompanying discussion sections or lab classes taught by teaching assistants. Due to class size, there is little personal interaction and it is difficult for instructors and students to develop any type of professional relationship.

3. Literature Review

Adapting any course to a Web-based environment is a complex process requiring a great deal of analysis and planning prior to implementation (Bichelmeyer, et al. 2001)(3). However, adapting a course for 3,500-5,000 undergraduate students presents unique challenges not experienced by instructors of small classes. Besides the obvious difference in scale, Pascarella and Terenzini (1991), acknowledge that the most common instructional differences between large and small residential site classes involve student motivation, course administration, information dissemination, teaching strategies, and higher-level cognitive processes. Recent efforts to assess and improve student outcomes in large classes have followed closely behind the growing body of evidence that supports active learning pedagogies over the common lecture format (Pascarella & Terenzini, 1991; McKeachie, 2005)(15)(13). Several studies have found that making the large class appear as a small class, can positively impact student satisfaction with the learning environment and increase faculty-to-student interactions (Cooper & Robinson, 2000)(9).

Arbaugh (2001) believes there is no relationship between class size and teaching quality at universities. The most compelling distinction between small and large class size lies in the instructor-student interaction. Small classes can support active learning pedagogies over

static pedagogies generally implemented in the large lecture format. Taking advantage of active learning pedagogies in small classes, students become more engaged with the instruction and are more satisfied with the course (Pascarella & Terenzini, 1991)(15). Although pedagogically there are differences between small and large class size, certain key issues and factors extracted from small course pedagogy can be valuable to large classes.

Research into large course pedagogy encourages instructors to make the large course appear small. When evaluating the quality of research presented by instructors adapting their small courses to the Web, the researcher can provide valuable, fundamentally sound pedagogical insight into the adaptation process. The adaptation process can then be modified to meet the different needs of the large-course instructor.

Pedagogical design literature for large, residential courses discourages teacher-centered instruction while encouraging more teacher-student interaction. Cooper and Robinson (2000) discovered in large, residential courses that the lecture format remains the prevailing teaching strategy. They found that this method of instruction generally lacks student engagement and invites little reflection on course content by the students. Lectures and discussion may be effective for fostering delivery of lower-level factual material but are less effective for fostering deep understanding and skill development. McKeachie (2005) advocates the integration of active learning strategies into the large course curriculum to increase student motivation and increase content engagement, thereby increasing long-term retention. If instructors want students to become more effective in meaningful learning and thinking, McKeachie claims, "they need to spend more time in active, meaningful learning and thinking - not just sitting and passively receiving information" (p. 210). Educators generally agree that small courses supporting learner-centered instruction are the preferred method for teaching and learning in higher education. Unfortunately, as the predicted increase in large-course enrollment indicates, the preferred method is not always feasible.

As research has shown, and as the author's personal experience has confirmed, active learning is difficult to implement and manage with class enrollments over 300 students per section. Unless activities directly affect student grades, students lack motivation to engage in the activities. If activities are used to assess learning, assessment becomes overwhelming for the instructor to track and manage. Finally, large auditoriums with fixed seating prohibit students from easily moving into small learning groups to participate in active learning group exercises. These barriers present a strong argument for adapting the large, residential course to the Web.

4. Small Course Web Adaptation

Inherent differences in structure and pedagogy exist between small and large, residential courses (Pascarella & Terenzini, 1991; Cooper & Robinson, 2000)(15)(9). Despite these differences, researchers adapting small, residential courses to the Web provide valuable insight into the process, which provides practical guidance for the large-course instructor. Although no single study to date contains a comprehensive list of issues for instructors of large courses to consider during the adaptation process, distinct issues emerged from the

literature. These key issues can be separated into three general categories of decision-making, creating a conceptual framework for adapting a large, traditional, lecture-based, residential course to the Web:

- Course-level decisions include instructional mode, amount and type of interactivity and operational issues.
- Instruction-level decisions include defining course objectives and learning outcomes, defining critical content and types of learning encountered, instructional methods supporting types of learning as well as media which support instructional methods. Instructional materials and their sequence are also included in this level.
- Pedagogical decisions should be made at the course level and instruction level and indicate how to teach in the Web-based environment.

Key decision-making guidelines are shown in Table 1 and will be discussed in detail below.

Guidelines for Adapting Large Course to the Web

- Course-level Decisions
  - Mode of Web-based instruction:
    - Adjunct
    - Mixed
    - Wholly online
  - Interactivity
    - Amount of interaction
    - Structure of the interaction
    - Incorporation of small learning communities
  - Operational Issues
    - Hardware & software
    - Technical support
    - Bandwidth
    - Communication speed
    - Cost of course materials
- Instruction-level Decisions
  - Course objectives & learning outcomes
  - Critical content, types of learning, instructional methods, & media selection
  - Instructional materials
  - Instructional sequence
- Pedagogical Decisions
  - Course learning goals
  - Philosophical changes
  - Assessment & evaluation
    - Students
    - Instructors
    - Course
  - Instructional activities

Table 1 - Key Issues Adapting a Large Course to a Web-based Instructional Environment

5. Course-Level Decisions

5.1 Instructional Mode

The first issues considered in the adaptation process should be instructional modality and interactive organization of the course (Boettcher & Conrad, 2004; Bonk, et al. 2000)(4)(5). Residential course meeting times and location are determined by university administration. Teaching on the Web eliminates boundaries of time and space, allowing for flexible instruction. Bonk et al. (2000) provide a framework for integrating three modes of instruction into a course: adjunct, mixed, and wholly online. Following a continuum of Web integration (see Table 2), modes of instruction range from primarily informational usage of the Web (adjunct); to a blend of occasional face-to-face meetings, online discussions, and Web-based supplemental course materials (mixed); to the entire course being taught in a Web-based environment (wholly online). Within this mode of instruction, determination of the degree of Web integration will guide course development procedures and pedagogical decisions. Applying the Bonk et al. (2000) Web continuum framework to the large, traditional, lecture-based, residential course being adapted to the Web, it will be necessary to make all course design decisions at Level 8 on Table 2. This level defines interactivity for an alternative delivery system for residential students.

Levels of Web Integration	Description
1. Marketing/Syllabi via Web	Instructors use Web to promote course and teaching ideas via electronic fliers and syllabi.
2. Student Exploration of Web	Students use Web to explore pre-existing resources, both in and outside of class.
3. Student Generated Resources Published on Web	Students use Web to generate resources and exemplary products for the class.
4. Course Resources on Web	Instructors use Web to create and present class resources such as handouts, prior student work, class notes and PowerPoint presentations.
5. Repurpose Web Resources	Instructors take Web resources and course activities from one course and, make adjustments, use in another.
6. Substantive and Graded Web Activities	Students participate with classmates in Web-based activities as a graded part of course requirements.
7. Electronic Conferencing Course Extending Beyond Class	Students are required to use electronic conferencing to communicate with peers, practitioners, teachers, and/or experts outside of the course.
8. Web as Alternative Delivery System for Resident Students	Local students with scheduling or other conflicts use Web as a primary means of course participation, with the possibility of a few live course meetings.
9. Entire Course on Web for Students Located Anywhere	Students from any location around the world may participate in a course offered entirely on Web.
10. Course Fits Within Larger Programmatic Web Initiative	Instructors and administrators embed Web-based course development within larger programmatic initiatives of their institution.

Table 2 - Ten Levels of Web Integration Continuum (Bonk et al., 2000, p. 57)(5)

Boettcher and Conrad (2004) also divide Web integration into three modalities: WebCourse, WebCentric, and WebEnhanced. The WebCourse is delivered wholly online and can be accessed anywhere, anytime via the WWW. Students can take the course from any location in the world as long as they have access to the Web. A WebCentric course shifts the focus from the physical classroom to the Web, as the classroom environment. Course communications, resources, testing, project, and learning are accomplished using Web technology. With a WebCentric course, students and instructor are on the same campus, giving them the ability to schedule FTF meetings if necessary. A WebEnhanced

course looks a great deal like a campus course that is strengthened by the use of the Web. The Web is used to present course administrative documents, resources, and class projects, but the majority of learning takes place in the traditional classroom.

Bonk et al. (2000) and Boettcher and Conrad (2004) have captured the types of Web integration that can be incorporated into Web courses. They agree Web integration can range from instruction taking place completely on-line or partially on-line, to the Web as an information dissemination tool for a FTF course. Bonk et al. (2000) split the three basic types of Web integration into several sublevels. The levels provide guidelines of Web integration for different instructional situations. Boettcher and Conrad (2004) discuss the same types of Web integration as Bonk et al. (2000) list in their Web continuum. The sublevels of the Web continuum provide an organized framework for the amount and type of integration into a Web course design.

5.2 Interactivity

In addition to instructional modality, Bonk and Dennen (2002) stress the importance of considering the amount and form of instructor-to-student and student-to-student interactivity. Determining the desired Web interaction provides the communication framework for the course, meaning the types and depth of communication. The communication framework defines what synchronous and asynchronous communication tools are used, e.g., e-mail, electronic bulletin boards, and chat rooms (Boettcher & Conrad, 2004)(4). The Web's ability to increase interactivity among users enables instructors of large courses to integrate activities into the curriculum that would otherwise be extremely difficult due to large enrollments and constraints imposed by the large lecture hall. The interactive Web environment allows for threaded discussions among students, thereby facilitating student participation (Boettcher & Conrad, 2004)(4). Students generally do not participate in discussions of any type in large, residential courses. This interactivity provides more opportunities for increased interaction. A key element of the large course adaptation process is to design and develop the course according to current research and practice, which indicate that small, learning communities facilitate learning best in Web-based environments (Hiltz & Turoff, 2002)(10). According to Carlson and Everett (2000), the ideal small group size is 5-10 members. If the purpose of the group is to collaborate to complete a paper or case study, the smaller number of people in a group is better. Their research indicates that undergraduates do not work well in on-line groups and need more assistance and input from the instructor. For undergraduates, specific guidelines for conducting online discussions should be posted, and team leaders should be appointed to facilitate (Carlson & Everett, 2000)(8).

5.3 Operational Issues

Operational issues include student computer hardware and software requirements, and the availability of technical support. Ensuring students acquire the required hardware and software to actively participate in learning communities is another key issue to consider. LaFleur (2004) also suggests bandwidth, speed of communication lines, and cost of materials as issues to consider. Course management software for student submissions or

information distribution should also be considered. The more experience instructors have dealing with operational issues, the easier it will be to direct students, and the greater the possibility for interaction.

Research and experience with undergraduate students indicate that eliminating all ambiguity on directions and project procedures increases opportunities for student success and decreases opportunities for confusion (Cooper & Robinson, 2000)(9). Dealing with operational issues early in the adaptation process allows instructors to identify areas of possible student confusion and misunderstanding and eliminate the problems before students engage in course materials.

6. Instruction-Level Decisions

6.1 Course Objectives and Learning Outcomes

Course objectives and learning outcomes for a Web-based course may remain the same or change from the FTF course based on instructor or departmental expectations. Bichelmeyer et al. (2001) recommend determining course objectives and learning outcomes as the initial step in the adaptation process since these decisions will guide all subsequent design decisions, rather than determining instructional modality first. Interestingly, Carlson and Everett (2000) fail to address issues of modality or interactivity as an initial step but argue that course goals, objectives, and learning outcomes should be the first consideration. They believe that decisions directly affecting course setup are not considered part of the instructional design process because those decisions may be determined by administrators rather than faculty. Carlson and Everett (2000) suggest that choosing the courseware should be one of the last steps an instructor should consider when adapting a course to the Web. They believe it is better to choose a courseware system that meets the needs of the course design, rather than designing a course around the courseware system. I support Carlson and Everett's (2000) argument, because the courseware system can constrain the instructor's design decisions due to the availability of tools within the system. However, for the novice Web adapter, designing a course around the courseware system can provide an intact communication framework for delivering the course that can save a great deal of time during the design and development stages.

Current practice indicates both course objectives and learning outcomes will change slightly when the learning environment changes to the Web because it offers teaching strategies unavailable to instructors of the large, residential course. The course objectives and outcomes can differ based on the availability of interactive resources.

6.2 Critical Content, Types of Learning, Instructional Methods and Media

Bichelmeyer et al. (2001) advocate that the instructor defines critical content components of the course and contemplate how these components fit within the Web-based instructional environment. Identifying critical course components requires the instructor to focus on essential information to be taught while eliminating extraneous materials. Although

Bichelmeyer et al. (2001) discuss gathering and preparing materials for the Web-based environment at this time, their study fails to address instructional methods or media selection. LaFleur (2004) emphasize identifying types of learning students will encounter, which will be determined by the critical content. She suggests determining which instructional methods will foster the types of learning identified and the ones that will allow the instructor to maintain the intended purpose of the course. The methods available for implementation in Web-based instruction can be quite different from those available for the instructor of the large, residential course (Boettcher & Conrad, 2004)(4). For instance, collaborative learning, cooperative learning, discovery-based learning, engaged learning, and problem-based learning are various methods that are often difficult to implement in the large lecture hall because of classroom size, seating arrangements, as well as large group facilitation issues. The time involved in assessing and assigning grades to these types of activities can be an overwhelming task for the instructor of a large course.

LaFleur (2004) maintains that instructional methods will drive media selection. Most media are flexible, in that each can be used for a variety of teaching functions. Accordingly, while most media can present abstract knowledge and ideas, which are mainly conveyed through the use of spoken or written language, few media are able to present concrete examples of objects, processes, and events. When instructors adapt their course to the Web, it is important to be sensitive to the advantages and disadvantages of the virtual classroom. Web-based instruction is well suited for collaborating, communicating, and information dissemination, but is not good for reading long text files (Boettcher & Conrad, 2004)(4). It is best to minimize text-based lectures and utilize other media available. Video material is a very rich and flexible medium capable of conveying both abstract knowledge and concrete examples, so it is particularly valuable for demonstrating procedures or events.

LaFleur's (2004) approach entails selecting instructional methods that foster the types of learning identified. Generally in large courses, the types of learning addressed in the lab sections are procedural learning, learning by doing, and problem-solving skills. Those activities generally addressed in the large lecture are facts, concept-discrimination, and problem-solving skills. The enrollment size and classroom constraint of the large course often prevent integration of other types of learning.

6.3 Instructional Materials

The Web allows instructional materials to move away from the linear format of the traditional, residential course to a non-linear format supported by hypertext. Initial development of online course materials is a very labor-intensive process, and instructors must give themselves adequate time to develop effective instructional materials that support the course learning goals and objectives. It is important to combine materials in print, video excerpts, voice, and audio excerpts to develop non-linear, linkable content (Carlson & Everett, 2000)(8). They also suggest, as instructional materials are developed, it is crucial to keep students' access and availability to the technology in the forefront of design decisions, "don't use a technology so sophisticated that your students are not likely to have access to it" (p. 3). If students are unable to access streaming audio or video material with the technology available, then the material should not be included in the course.

6.4 Instructional Sequence

Once critical content is determined and methods, media, and materials are selected, the Web environment provides the large-course instructor with instructional sequence freedom. Large-course research indicates that when the physical constraints of the classroom are removed and a new learning space is created on the Web, the instructor will be given the opportunity to restructure content and to sequence instruction to incorporate once separate components into one interactive, integrated experience (Cooper & Robinson, 2000)(9). Merging previously separate components, such as lab and lecture, into one cohesive course requires the instructor to examine pedagogical decisions (Boettcher & Conrad, 2004)(4).

7. Pedagogical Decisions

Pedagogical issues, the third type of adaptation consideration, address decisions of how the instructor will teach students in the Web-based environment. They require instructors to identify teaching strategies within the Web-based instructional environment, rather than the overall Web-based course architecture, as in course-level and instruction-level decisions.

Key pedagogical issues identified include: course learning goals; philosophical changes in teaching and learning; instructor's role; evaluation of the student, instructor, and course; and instructional activities available via the Web. Certain pedagogical decisions will be made at the course level, and some decisions will be made at the instruction level. As discussed above, Pascarella and Terenzini (1991) and Cooper and Robinson (2000) address pedagogical constraints imposed in the large, residential course. The interactivity of the Web permits large-course instructors to integrate activities precluded in the traditional classroom, allowing the course to shift from teacher-centered instruction to student-centered learning. Specifically, integrating the Web as a collaborative tool changes the nature of the learning process and instructor-to-student relationship (Hiltz & Turoff, 2002)(10). Within the Web, the instructor takes on the role of facilitator and resource guide as opposed to lecturer and large-course administrator.

7.1 Course Learning Goals

When adapting a course to the Web, the first pedagogical question any instructor should ask relates to the basic purpose of the course. According to LaFleur (2004), each instructional experience should be chosen to support the course purpose. She suggests a continuum to help instructors extend the traditional classroom model to one improved by electronic processes and global resources available on the Web. One of the goals for adapting, a large, residential course to the Web is to move from static content toward supporting knowledge production through interactive learning environments; an interactive learning environment supports structured interaction between communities of learners (Boettcher & Conrad, 2004)(4). The question instructors should then consider is how the purpose of the course changes with the integration of the active learning environment.

7.2 Philosophical Changes

Research indicates students need to be self-regulated while working independently on the Web (Twigg, 2003)(18). A Web-based learning environment allows a shift toward student-centered instruction, and requires philosophical changes in the roles of the instructor, student, and type of instruction. Bonk, Kirkley, Hara, and Dennen (2001) believe that a shift in thinking is required from information transmission to viewing the goal of instruction as student engagement with the material. This assumption provides a framework for large-course instructors to consider when adapting their courses to the Web, rather than concentrating solely on information consistency issues. Instructors can now consider integrating active learning, collaborative learning, and cooperative learning activities into the curriculum. New approaches to teaching and learning can help foster an environment prohibited by the constraints of the large, residential course.

7.3 Assessment, Feedback, and Evaluation Considerations

Moving from the traditional classroom environment to an active learning, Web environment requires instructors to rethink the entire process of evaluating student learning. Evaluation must be continual and ongoing if it is to be fair and accurate within the Web (Kahn, 2005)(11). Without visual and oral cues available in residential classrooms, the instructor may be unaware of student confusion or misunderstanding. The goals of testing are to determine if learning objectives have been accomplished, help students assess their level of knowledge of course material, and provide the instructor with levels of student comprehension. Feedback is widely referred to as communication with a learner to inform him or her of the accuracy of a response to a question (Kahn, 2005)(11). The purpose of feedback is for students to improve their learning. They need to receive appropriate and focused feedback early and often; they also need to learn how to assess their own learning. Because Web-based instruction typically provides a self-contained learning environment, it is critical to pay especially close attention to the kinds and amount of feedback incorporated into the course. While research does not indicate a particular kind of feedback to be superior, it has been suggested that feedback must be quicker and more in-depth than in a FTF course.

Hiltz and Turoff (2002) review evaluation issues from a larger perspective than mere student achievement. They propose the use of formative feedback and summative evaluations to appraise the course. These evaluation methods assess the curriculum for strengths and weaknesses rather than student satisfaction in the environment. The goal of this type of evaluation should be continuous improvement of the course.

7.4 Instructional Activities

In the large, residential class, the focus of instruction is on delivery of content, and on the Web, the focus shifts to how students engage with the information. In the large, residential course, there is often little interaction between the instructor and student. McKeachie (2005) defines this as a "perceived distance" (p. 213). Lack of interaction has been a major source of student dissatisfaction with the large, lecture course. Increasing interaction

through the Web removes the barriers of perceived distance between instructor and student and helps create an online community of learners (Hiltz & Turoff, 2002)(10). Developing an online community of learners is one method to increase instructor-to-student and student-to-student interactions as well as increasing overall student satisfaction with the course.

The Web provides a learning space for cooperative and collaborative learning activities, eliminating the physical constraints imposed by the large lecture auditorium. Students now have the opportunity to explore material in greater depth and interact with both peers and instructors on a deeper level (Bonk & Dennen, 2002)(6). Instructional activities available through Web-based environments far exceed those available to the large, residential course instructor leading to greater learner satisfaction.

8. Conclusions

Until recently, students heading off to college had a general idea of what the traditional, undergraduate experience would entail. They took classes in classrooms and labs with an instructor who was physically in present. There was a syllabus, lectures with note-taking, and exams. If necessary, students could attend instructor office hours for assistance. Going off to college meant living near or on campus with "seat-time".

Today, online learning is changing the face of traditional education in multiple ways. What will happen and how the traditional classroom will evolve is a complicated and as yet unsolved, puzzle. What is certain is the increasing number of traditional, on-campus courses being adapted to an online instructional environment. This article has outlined strategies and guidelines which instructors should consider for large course adaptation. A conceptual framework emerged describing decision-point considerations: course-level decisions, instruction-level decisions, and pedagogical decisions.

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