Roadmap For A Successful Transition To An Online Environment

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ABSTRACT

Tighter budgets and lower enrollment are changing traditional higher education. The popularity of the World Wide Web (WWW) coupled with faster access to information provides an opportunity for Colleges and Universities to offer online programs. In most cases, traditional universities are not well prepared for the transition to online format and many challenges prevent a successful implementation. A common mistake made by early adopters is assuming that the migration involves two steps, namely selecting the virtual learning environment, and then porting the current classroom-based courses to the online environment. That approach often leads to failure and disappointment, not to mention lower student and faculty satisfaction. Traditional delivery of course materials is done face-to-face with students present and the student/faculty interaction promotes learning. In the online environment, learning is done in an asynchronous mode and course design has to compensate for the interaction that happens in real time during traditional courses. To properly implement online courses, an adequate technical environment must be available. If the environment is available, careful planning is essential in order to proceed. Traditional course modules require revision as they are migrated to cyberspace and should take into account the interaction among students and faculty in order to promote a quality learning process. A typical approach is to include student participation in discussion forae, but this may lead to trivial postings and students responses. In this paper, we present preconditions for a migration to online education and a roadmap to transition traditional courses to cyberspace. We also discuss methods of assessing both quantity and quality of student interaction, since this is a requirement for learning in cyberspace.

Keywords: Online education, Virtual Learning Environments, Higher Education, instructional design

INTRODUCTION

Tighter budgets and lower student enrollment are changing traditional higher education. Many individuals do not have access to traditional higher education, mainly due to work and family commitments. The popularity of the World Wide Web (WWW) coupled with faster access to information provides an opportunity for Colleges and Universities to offer online programs to attract non-traditional students and to provide more flexible schedules for current faculty. In most cases, traditional universities are not well prepared for the transition to an online format and many challenges prevent a successful implementation (Caplan, 2004, p. 176). A common mistake made by early adopters is assuming that the migration involves two steps, namely selecting the virtual learning environment (VLE), and then porting the current classroom-based courses to the online format. That approach often leads to failure and disappointment, not to mention lower student and faculty satisfaction. Traditional delivery of course materials is done face-to-face in a classroom on real-time with students present and the student/faculty interaction promotes learning. As questions arise, students have the opportunity to ask the instructor and other students benefit from a single student's question. The instructor is able to tailor the material based on the questions asked in class. An experienced instructor can detect if the students are "getting it".

In the online environment, learning is done in an asynchronous mode and the instructor does not have the immediate feedback to detect gaps in the learning process. When porting traditional materials to the online environment, the design of the course has to compensate for the interaction that happens in real time during

traditional courses. To properly implement online courses, an adequate technical environment must be available. If the environment is available, careful planning is essential in order to proceed. Traditional course modules require revision as they are migrated to cyberspace and should take into account the interaction among students and faculty in order to promote a quality learning process. A typical approach is to include student participation in discussion forae, but this may lead to trivial postings and students responses. In this paper, we provide a sound roadmap to transition current classroom-based courses to an online environment. The paper is organized in four sections: Pre-Transition, where we discuss issues to consider prior to migration and the planning for the transition; Transition, where we present ideas to organize the migration of course materials online; Post-Transition, where we include issues to consider ensuring a meaningful learning experience; and we conclude with a Lessons Learned section.

PRE-TRANSITION

While the Internet has been around for a couple of decades now, access to information was limited to slow dial-up speeds. The invention of the World Wide Web (WWW) and faster connection speeds, including the ubiquitous availability of broadband access to the Web paved the road for online higher education. Previous attempts to reach non-traditional students included using electronic mail, prerecorded lessons, and self-paced instruction. Next, faculty provided course materials on personal web pages that students were able to access offline. Some instructors even created Web pages as Assignment DropBoxes to allow students to submit assignment electronically.

Virtual Learning Environments (VLE) became available in the last decade and some commercial systems are popular, such as WebCT/BlackBoard, Angel, eCollege, and others. Some VLEs have been funded by non-profit organizations (Armitage, Boyer, Langevin, & Gaspar, 2009; Buendia, Cano, & Benllock, 2009). Sample VLEs are shown in Figure 1.

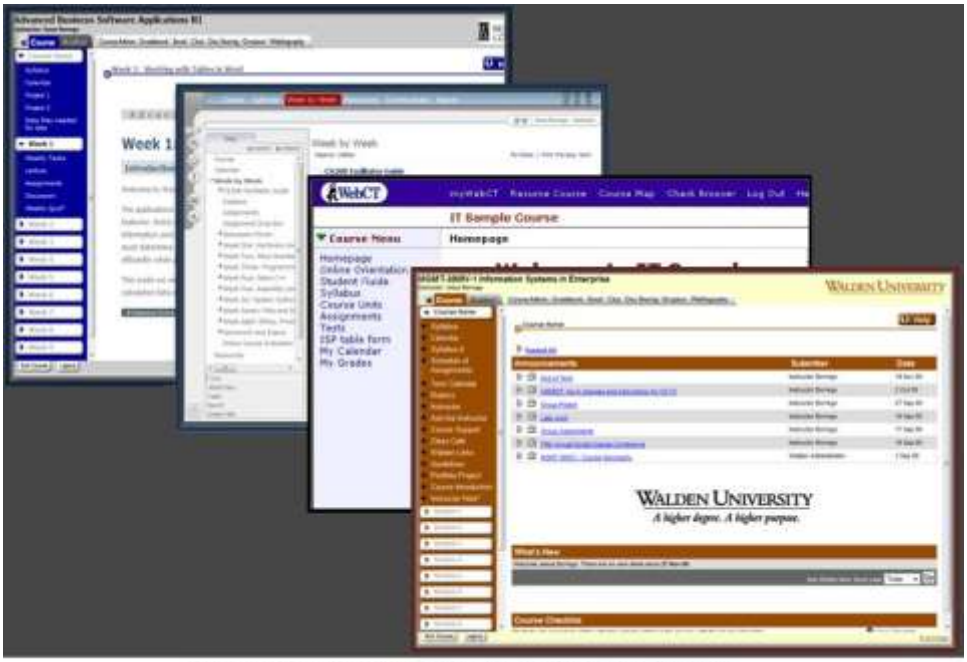

Figure 1. Sample Virtual Learning Environments (VLEs).

These VLEs make course material available to students, handle user access, monitor student participation, provide access to quizzes and exams, and most of them provide an electronic gradebook. Using these VLEs course materials can be made either flexible (to be modified by each instructor), or strict (where the basic materials are not modified). In either case, students and faculty can post messages and reply to each other.

Before considering a migration to an online environment, faculty members must consider the infrastructure required. This includes a Web presence; electronic mail; Information Technology (IT) support for faculty, staff, and students; library support for remote students; and training for both faculty and students. IT support is essential to ensure adequate access to course materials is provided and controlled.

There are two types of training necessary for faculty: Course Development, and Course Delivery. The course development training is intended to familiarize faculty members with the intricacies of developing course materials online and may include creating Web pages, creating supplementary materials, creating interactive exams, publishing video, and creating supporting reference materials. For students, training may include a sample skeleton course that introduces the learner to the different components of the VLE; electronic communication etiquette; course support available; technical support resources; assignment submission and grading; course forum participation requirements, including postings and replies; and plagiarism training. During online transition planning, a team should take an inventory of the courses that will be migrated. There are four basic options:

1. Pilot project. This option provides a low risk-approach to migration. A single course may be selected for migration in order to test the technology and infrastructure. This single course can be used to train faculty in the new online environment. Afterwards, it can be tailored to train students in the same manner.
2. Phased transition. This option selects a set of courses to be migrated. Typically, introductory or prerequisite courses are migrated first, followed by the next set of courses in sequence.
3. Full implementation. This option migrates an entire program to the online environment. This may be the highest risk approach.
4. Incremental implementation. Under this option, a department may be migrated first, followed by other departments at a later date.

The four options are not mutually exclusive. A department may elect to start with a pilot project first, then select an incremental implementation for a department, where introductory courses are ported first, followed by subsequent courses. Once a department is migrated, other departments may follow suit. This approach has been successfully implemented at various Universities (Armitage et al., 2009; Caplan, 2004) including Walden University and Regis University. Most traditional universities offering online courses retain the traditional course format, so it is important to ensure that the objectives of a course remain the same, whether it is offered online or in a classroom-based format.

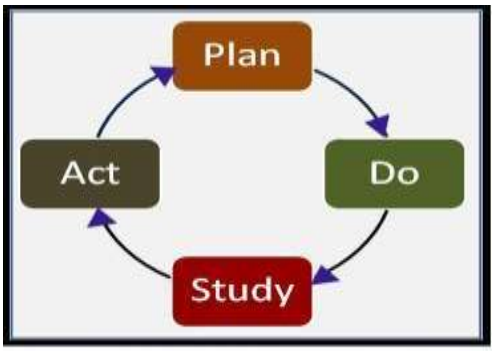

Figure 2. Shewhart's PDSA Cycle.

Walden University offers Bachelors, Masters, Ph.D., and Doctorate degrees in a variety of disciplines. In the School of Management, an International Dual Degree modeled after the domestic Bachelor of Business Administration was approved. The degree is offered to international students and it is conducted entirely in English in an online environment. This author was asked to develop seven courses for the international dual degree. At Walden University, we followed Shewhart's Plan-Do-Study-Act (PDSA) Cycle of Learning when porting courses online. The cycle is shown in Figure 2. The cycle is an iterative approach to implementing a solution and involves initial planning, implementation, analyzing the solution, and making corrections to improve it.

When selecting courses to either develop or port, we use a Course Planning and Scope & Sequence (CP&SS) tool to plan the course content. If we are porting a course, most of the objectives have been defined and perhaps a textbook is in place. For new courses, the objectives are identified and a textbook may have to be selected. The CP&SS consists of an introduction and two sections. The introduction contains the course name, title, launch date, and learning materials. The two sections are the initial planning and implementation details. Both sections are broken down into modules corresponding to weekly activities. The initial planning contains the learning objectives, required and supplemental resources, prerequisites, any media elements, discussion questions, any assignments, important contributing scholars, and midterm and final assignments (including exams, projects, or papers). The details section contains more information about each module and includes a bibliography for the course. Sample CP&SS is shown in Figure 3.

The first section of the CP&SS is used during the planning phase and assigned to a faculty member. Once it is completed, it is reviewed by at least two individuals to ensure compliance with defined objectives for the course. Once it is approved, the faculty member implements the course in the VLE during the Do phase of the PDSA cycle.

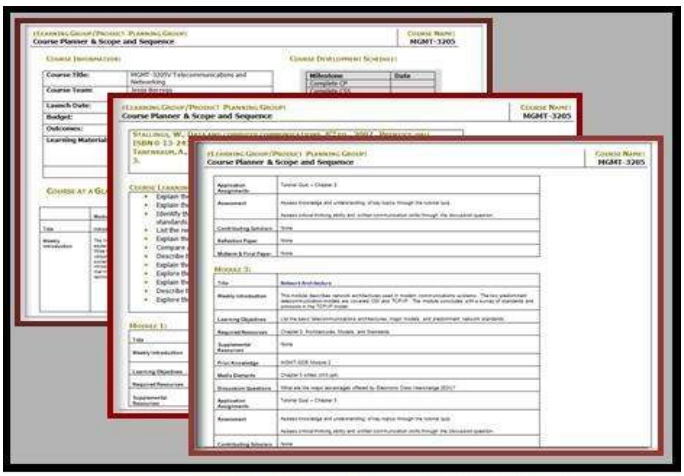

Figure 3. Walden University's CP&SS.

TRANSITION

During the Do phase of the PDSA cycle, a faculty member develops any materials identified in the CP&SS, including supplementary materials and multimedia files. If external references are required, these are identified and any permission to use these are obtained. When the course is ready, it is submitted to the course development team where it is evaluated for form and content. After any corrections are made, the course is launched. At this time, the Study phase of the PDSA cycle starts, where any discrepancies or errors are detected and documented. At the end of the course, a Course Maintenance form is prepared to address any changes before the next course offering. This is the Act phase of the cycle.

This author used this approach to port seven courses in 2007. The first course was offered in early 2008. The remaining courses were offered after the Summer 2008 session. Minor revisions have been made to the courses, except for one, where a new edition of the book was published and this required some assignment changes.

POST-TRANSITION

In an online environment, learning is increased when meaningful interaction occurs among faculty and students, and especially between students. During the preparation of the online courses, the faculty member attempts to provide meaningful questions to students. These questions are intended to allow the students to reflect on the

material introduced in that module before attempting to answer the question. Students are asked to post their answers typically mid-way through the module. At Walden University, our modules correspond to weeks. Students are asked to post their answers by the end of Wednesday. Then, students have to provide at least one comment to another student's answer. The intent is to elicit critical thinking among the students. As students interact with each other, they are more careful in their answers, in order to avoid criticism. This is called *self-regulation*, defined as "a metacognitive skill regarding a single person which is related to the development of the ability to control his/her thinking process and/or actions, in order to meet his/her predefined goals (implicit or explicit)" (Bratitsis & Dimitracopoulou, 2009). In early courses, students post many "I agree" comments with no evidence of critical thinking. It is up to the faculty member to discourage these trivial postings. As the course progresses, students adjust their posts with more quality comments.

While most VLEs provide rudimentary tools to assess the student interaction, the faculty member has to manually examine the postings and determine which postings are not appropriate. This is normally done at the end of the module when students get to see their grade for that module.

LESSONS LEARNED

Before attempting to migrate traditional courses to the online format, it is essential for Colleges and Universities to have adequate support and solid infrastructure. Without a capable IT group to configure and manage the infrastructure, online education becomes a nightmare for the faculty member or department. While this was a huge problem a few years ago, it may not be so in today's highly-wired environment, but it must be considered during the planning phase of the transition. Just because the University's IT department is capable of supporting current faculty and students, it may not be ready for extending that support to the remote population.

Prior to enrolling in online coursework, students must be made aware of the computer and technology requirements, especially with regards to Operating Systems, Web browsers, required software and tools, and connectivity speeds. If the required software is not provided by the University, the students may be required to purchase it, and this may be very expensive for a typical student's budget. To avoid problems, there are schools that provide each new student with properly equipped laptops that contain all supported software, such as word processing, presentation, spreadsheets, communications, electronic mail, and department-specific tools depending on their degree plan. For a Business department, the set of tools may include spreadsheets, statistical analysis tools, presentation software, and the like. For a Computer Science department, the tools may require operating systems, compilers, debugging tools, and similar applications. Regardless of student's major, typical requirements may include operating system, anti-virus software, Web browser, word processing software, spreadsheet, graphics tools, email, and communications software.

In classroom based courses a set of objectives, textbooks, and supplementary materials are normally defined for a given course. The faculty member is then free to manage the delivery of these materials to the students. When the course is ported online, new material is typically required to augment or replace classroom based lectures, due to the asynchronous nature of the online format. Apart from the reading assignments, this may include additional, off-line research on material covered for each module, individual or group activities, discussion questions, and other such assignments.

Even if all of the previous issues are addressed, we are still faced with a crucial question: Are we providing a quality education to the students? As previously mentioned, the quality of the learning is directly related to the time investment provided by the students. Merely displaying course materials online and asking a few questions in a discussion forum does not guarantee quality learning. Some students will actively participate as much as possible, but some others will attempt to do the minimum required to pass the course.

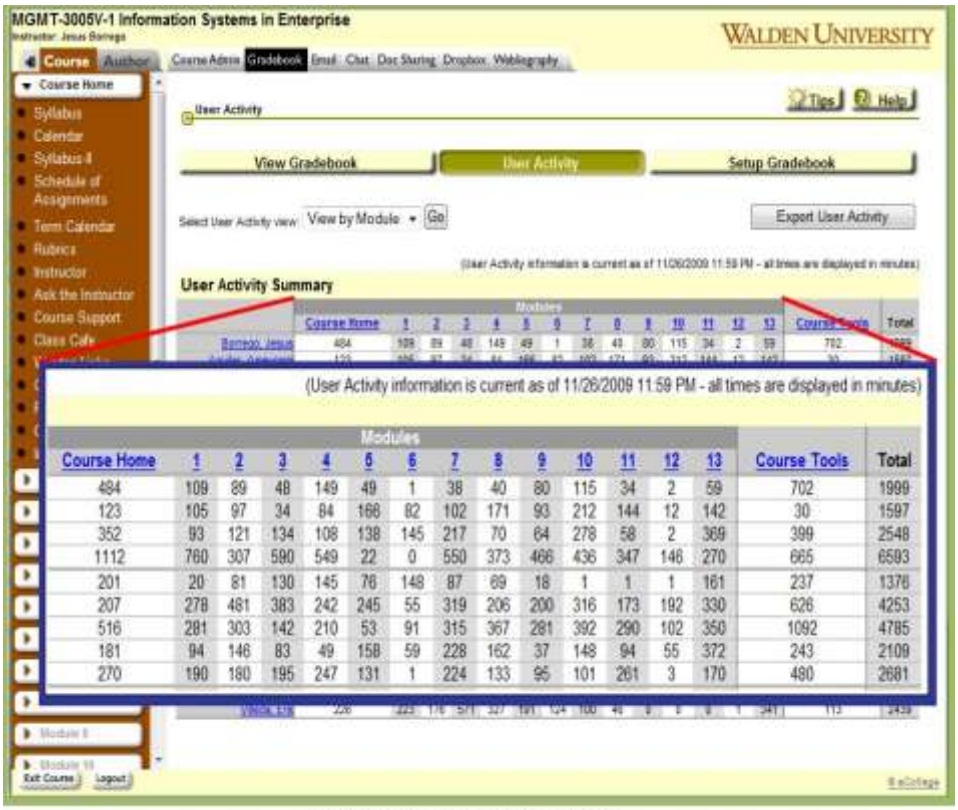

Figure 4. Sample User Activity Report.

Most of the VLEs provide rudimentary metrics to measure the quantity of interaction, but not the quality of that interaction. Example reports may include the number of posts by each student for each module, or the time each student spent online for each module. Figure 4 shows a sample eCollege report of user activity. It displays the number of minutes spent by each individual on an individual module. In online courses, we cannot assume that the individuals spending the most time online are the ones learning the most. A student may log on to the course, read the material while connected, or even perform other tasks not related to the course. The VLE keeps track of the connected time. Clearly, this cannot be used as an indicator of the learning quality. Students receive feedback on their work from the faculty member, but this is typically done at the end of the module. At Walden, students have until midnight Sunday to post their answers to students, so the faculty member typically grades the postings after the submission. The students get their feedback as they prepare for the next module. It would be more beneficial to the students if they could get a real-time indicator on the quality of their work without having to wait until the following week. If we could have automated tools that parse the interaction and provide a tentative evaluation of the content, students can modify their postings earlier. Some researchers are studying ways of presenting students with indicators of their interaction with other students (Bratitsis, 2009). Some of the indicators, called Interaction Analysis (IA) Indicators include the number of times a student posted, how many times the student replied to other student(s), and graphical diagrams of these interactions with respect to other students. When students see how much they are participating compared with the rest of the class, they tend to increase their participation. Sample indicators are shown in Figure 5.

Since the students can immediately see how they compare with the rest of the class, they are motivated to perform better, by either correcting their posts, or increasing the quality of the interaction. In Figure 5a), two bars are displayed. The red bar displays the number of postings created by each student, and the blue bar displays the size of the post. Together, they inform the entire class of the level of participation of each student compared with the rest of the class. The graph is created dynamically and gets updated every time a post is saved. There is no need for the student to wait for the instructor to grade the participation. Researchers have found that this visual, dynamic

feedback promotes *self-regulation* and leads to higher quality of student participation: "Students who believe that their work is interesting, important and useful put more effort and time into their work and report more use of self regulation strategies" (Jermann, 2004). In Figure 5 b), the graph is the *Classification Indicator* an XY scattered chart where the number of messages as percentage of the total number of messages is shown for each student, plotted against the number of messages read as a percentage of all available messages. This chart will tell the students what percentage of available messages he or she has read. Finally, Figure 5 c) is the *Contribution Indicator* as a polar diagram where the students in a class are shown in a circle. A line from one student to another corresponds to the messages written as percentage of total messages for that period. This will indicate the amount of participation of each student. For more details, refer to Bratitsis (2009).

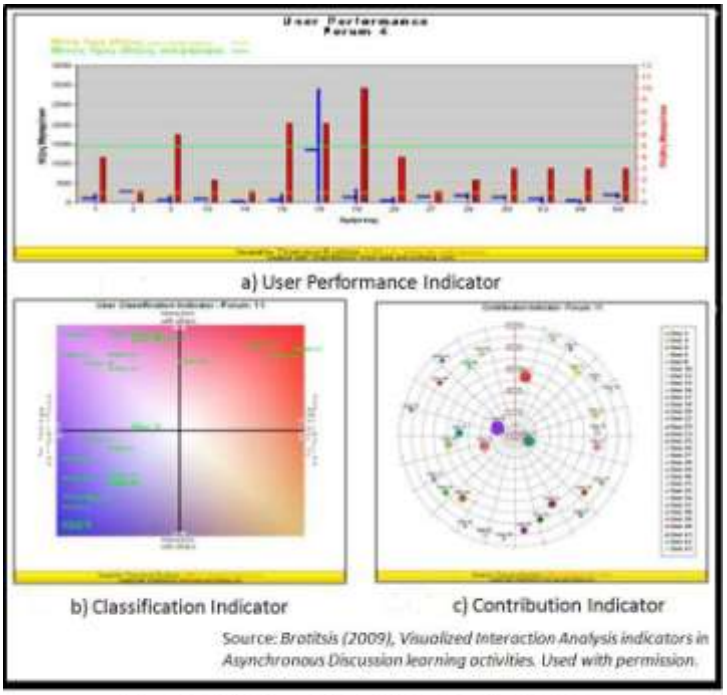

Figure 5. Self-Regulation Interaction Indicators.

The Interaction Indicators presented are a good step in assessing the quality and quality of the student's participation in online courses. However, the indicators are not widely available in VLEs and it is up to the faculty member to develop his/her own indicators. If the VLE provides visibility into the internal data stored, these reports can be easily produced.

AUTHOR INFORMATION

Jesús Borrego is a faculty member in the School of Management at Walden University. He is a Ph.D. candidate in the Applied Management and Decision Sciences with a concentration in Information Systems Management. He holds a Master of Science in Computer Science degree from Loyola Marymount University, and Bachelor of Science degrees in Computer Science and Electrical Engineering from California State University. He has over 20 years of experience teaching at the undergraduate and graduate levels in computer science, software engineering, business, and management in both classroom and online formats. His research areas of interest include computer forensics and technology in higher education.

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