A Study of Online Teaching & Learning Experiences in Higher Education: A Case Study of an American University VLE.

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Introduction

The University of Maryland University College (UMUC) is one of the largest online educational institutions worldwide. Enrollments for the fall of 2006 exceeded 90,000 students. The University supplies both distance learning and face-to-face delivery to its student population taught, by over 500 full time and adjunct faculty members. Campuses are located in 22 countries across the globe. "It is the largest public university in the United States offering online programs, with some 100 distinct undergraduate, graduate degree and certificate programs available." (University System of Maryland, 2007) UMUC is an open university, which strives to serve the non-traditional student. Most of its student population is comprised of working adults or military service individuals overseas.

Online Learning

UMUC programs are delivered through the University's own in-house Learning Management System (LMS). WebTycho is the LMS responsible for housing online undergraduate and graduate courses for the University's students. With similar features to other mainstream Learning Management Systems, WebTycho offers an array of asynchronous tools for delivering content and resources, conferencing, assessment and support. The University System of Maryland (2007) describes asynchronous learning as the provision of learning opportunities and support that can take place or be accessed at any time, i.e. is not fixed to standard timetabled lectures, seminars, labs etc.

WebTycho has been used both as a mechanism for delivering fully online degree programs as well as a supplemental tool for hybrid classes. While WebTycho provides many great tools for asynchronous learning, it is somewhat limited in providing for real-time, or synchronous, features other than a basic chat or an instant messaging system. This is because of the nature of courses provided at the University and the policies the institution has followed over the years. Many students taking online degree programs at UMUC are located in different countries throughout the world, thusly time zones have created barriers to introducing online synchronous learning.

Enhancing Online Learning

Towards the end of 2005, a committee was formed at the university, with the task of exploring the potential integration of increased elements of multimedia into online instruction with an emphasis on interaction to enhance teaching and learning. Traditionally UMUC has provided mainly asynchronous learning through its online classrooms; however the need arose to explore the uses of synchronous technology acceptable in certain situations. One of the questions the committee had during this time was "Is there reasonable evidence supporting the adoption of a synchronous collaborative toolset at UMUC?" (Odom, 2005) Over a period of time several commercial applications aimed towards online delivery were evaluated. Research by the initial committee indicated that software providing an environment to foster 'rich media' as well as synchronous online collaboration promised enhanced learning experience.

"Synchronous communication—collaboration that happens in real time—is supported most commonly by online chat and videoconferencing. These types of collaboration create an exciting environment not always possible through other methods, because they take advantage of the Internet's interactive multimedia features. This interaction provides immediate feedback for participants and builds connections that can lead to deeper learning relationships." (Electronic Collaboration: A Practical Guide for Educators, 1999)

Initially UMUC carried out research to determine if it would be feasible to introduce a synchronous technology into a traditionally asynchronous online teaching environment. Two software applications were evaluated during the research: Adobe Acrobat Connect Professional (formerly Macromedia Breeze) and Elluminate Live. It was later found that these types of learning environments offered much more than simply synchronous collaboration and, more so, could be used effectively in an asynchronous fashion. Adobe Acrobat Connect Professional, or Adobe Connect for short, was selected at the beginning of 2006 for piloting select courses at UMUC.

Aims and Objectives

This paper documents a study on the usability of Adobe Connect as Virtual Learning Environment or VLE within existing courses at UMUC. The purpose of the research was to evaluate online teaching and learning experiences based on existing models of teaching online. The student population, which consists mainly of non-traditional adult learners, influenced the methods of research and analysis. The paper builds on educational themes or ingredients to successful online learning based on teaching models for adult learners. These themes consisted of important educational theories to determine what, if any value, such a collaborative learning platform had brought to the educational experience. The research was based on three essential ingredients for successful online adult learning often referred to as andragogy. Enhancing interaction within the classroom, fostering an environment of deep learning and the facilitator's role within the online classroom. By evaluating student and faculty experiences it was possible to determine the educational impact Adobe Connect had with regards to successful online learning.

The aim of the study was to provide a report to UMUC detailing a thorough evaluation of the Adobe Connect pilot in terms its usability as a Virtual Learning Environment. The findings provided key recommendations from the research. It was necessary to evaluate whether the time, cost and resources poured into the pilot were put to good use and whether to continue, grow or eliminate it in the near future. The research involved sample groups of students and faculty involved with the pilot. It was essential to identify key components, which were both relevant and measurable. Metrics such as student satisfaction surveys and overall learning experiences helped to build a clearer picture of the effectiveness of the pilot. Examination of faculty classroom experiences when using the technology helped identify new processes and learning opportunities. This assisted in gaining insight into instructors' views on how effective Connect was in supporting their teaching.

The findings presented at the end of the study reflect on the success Adobe Connect has had as a learning system to enhance adult education in an online environment.

Exploring Adobe Connect as a "Virtual Learning Environment" or VLE

Adobe describes Connect as a platform with "capabilities for creating and deploying rich online communications — including blended eLearning curriculum management for real-time and self-paced training, plus a wider range of quiz types." (Adobe Systems, 2006)

The web-based application can be opened and accessed through a regular browser. The only requirement it has is the installation of Flash Player, a free downloadable application tool from Adobe that comes pre-installed on most new PCs. When opened, the Connect environment is similar to a typical Graphical User Interface (GUI) layout with windows or pods containing information and controls. Essentially it looks and acts like a regular web conferencing environment with tools for web cam support, chat, audio and visual components. Virtual rooms can be created for synchronous online meetings and recordings can be made of these sessions. Synchronous uses of Adobe Connect throughout the pilot included, instructor office hours, synchronous presentations or lectures, demonstrations for problem solving, team breakout sessions and collaborative projects and guest presentations.

Asynchronous Learning

The initial Elluminate / Connect research team wanted a platform that could be integrated into UMUC classrooms not only in a synchronous fashion, but in asynchronous ways to enhance overall interaction and use of rich media.

"*It is better to think of this type of tool more as a sort of a persistent container to house all manner of rich content, which may be shared in either a synchronous or asynchronous fashion. Indeed, this sort of asynchronous use is already taking place at UMUC and other institutions. A recent visit to Johns Hopkins Bloomberg School of Hygiene and Public Health revealed that nearly 100% of their use of Breeze was for asynchronous purposes. At UMUC, foreign language students are creating their own Breeze Meeting rooms in order to record themselves performing pronunciation exercises. The instructor may then listen to the recording whenever they wish.*" (Odom, 2006)

The possibilities reveals potential delivery of learning objects created within the environment for students to interact with asynchronously.

"Learning objects are small electronic units of educational information that are flexible, reusable, customizable, interoperable, retrievable, facilitate competency-based learning, and increase the value of content." (Instructional Design at ICS, 2005)

Storage of all kinds of media, from images and movies to interactive flash based learning tools, could be made available for the student. Connect was used extensively within the Undergraduate foreign language programs as well as several other Undergraduate and graduate disciplines. One foreign language faculty member described the platform.

"The students are using the Breeze rooms to record themselves completing the oral assignments that are part of the weekly workload for the language classes. At the beginning levels, they might record themselves reading short notes they've written and as the languages progress they record poems and essays. This is an important part of the online language learning experience." (Odom, 2006)

Other programs had students working in pairs to write and perform skits using Connect. They then recorded these skits and made them available in the classroom for all of the students to watch and comment on.

Synchronous Learning

Previous research at UMUC came to the conclusion that the adoption of synchronous tools within what has traditionally been an asynchronous institution raised "issues such as whether or not their use should be deemed mandatory given the logistics of calling a far-flung class scattered across multiple time zones together at a particular time. At the same time, it is clear that synchronous environments can add value to the online education experience. The ability to add a real-time, collaborative, problem solving environment enhances the distance learning experience. They also add and reinforce something vitally important to distance education, an enhanced sense of community in the online classroom." (Odom, 2006)

Models of Teaching through Technology

UMUC strives to understand the learning needs of adults, sometimes referred to as andragogy, which is why it has a reputation of embracing new technology to support online education. Before considering the Adobe Connect pilot research and findings, it will be helpful to review some existing learning theories and strategies concerned with andragogy to give a clearer understanding of teaching and learning experiences.

Dr. Malcolm Knowles, originator of the phrase "lifelong learning," developed the theory of how adults learn. His (1984) books found four important aspects of the adult learner and recommended four principles of the learning theory of andragogy. In his first principle, Knowles demonstrates that adults 'need' to understand why specific things are being taught. In a face-to-face classroom setting, it is often helpful for the professor to offer examples of learning subjects and emphasize their relevance. Whether the content is relevant to career or personal life, it essential the adult learner knows why they are studying the subject. In the online world, often students can become disjointed from the community even with a solid asynchronous learning community in place. Technology can help address some of these problems through enhanced multimedia, video and synchronous communications. Knowles asserts that adults need to focus on tasks rather than content. Adult learning should be problem-centered rather than content-oriented, which can often be challenging in the online environment. Different backgrounds of learners also raise issues of addressing these differences and accommodating various learning styles. This is not always possible using one method of delivery mechanism. Knowles also argues that adults are self-directed and want to discover things for themselves. By providing the right tools to foster these educational challenges it is possible to begin realizing the potential of enhancing the overall learning experience.

Connect was chosen for pilot as it was a tool that could potentially enhance interaction in many classes throughout the university as well as by adding value to overall teaching and learning. In the early days of distance education, before the explosion of online learning, Michael Moore (1989) wrote an editorial defining three types of interactivity:

- *learner-instructor* asking a question and having it answered by the teacher
- *learner-learner:* engaging in a conversation or debate about a learning topic
- *learner-content:* organizing cognitive structures in the mind based upon processing some content.

Anderson (2002) proposed an equivalency theorem that states: "Sufficient levels of deep and meaningful learning can be developed as long as one of the three forms of interaction (student-teacher; student-student; student-content) is at very high levels. High levels of more than one of these three modes will likely deliver a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences." (Kidney, G, 2006)

Deep vs Surface learning is an area of research, which has been discussed greatly over the years. It is however critical to understand the differences of these learning methods and more importantly how to foster an environment to influence surface based learners to move to a deeper learning approach. Surface learners tend to fall into the category of students who value the importance on 'minimum requirements'. They are interested only in passing the next test or reaching the 'needed' grade get through their course of study. They have little or no interest in creating and adding their own knowledge to theories or subjects in which they are learning. "Deep learning involves the critical analysis of new ideas, linking them to already known concepts and principles, and leads to understanding and long-term retention of concepts so that they can be used for problem solving in unfamiliar contexts." (Deep and Surface Approaches to Learning, 2007) By understanding the motivation that drives these two different types of learners, technology such as Adobe Connect can be approached in a way to address the issues of the surface based learner and create an environment conducive to deeper learning.

"Traditional distance education has typically been constrained by the limitations of time and location, making it difficult for instructors and students to perform educational activities satisfactorily (Sauve, 2000). Recent advances in distance education, however, provide a bridge between teachers and students and enable them to communicate more easily and interact more flexibly." (Chen N. S., Ko H.-C., Kinshuk and Lin T., 2005)

While getting everyone to meet online at the same time can be a challenge, it is however closer to a traditional classroom setting, which can be an advantage to synchronous learning. Chen Et al, in their article on synchronous learning, highlight two main advantages of this type of learning. The first and foremost advantage is that of immediate feedback, which can be provided to students so that they can immediately correct themselves or strengthen what they have learned. Secondly, Increased level of motivation and an obligation to be present and participate which in turn would increase students involvement in learning activities, hence resulting in better learning experiences (It-analysis, 2001). In her five-stage model, Salmon (2002) reveals the importance of electronic moderation within online education. Electronic moderation involves the professor's role as a facilitator, supporting the student through course access and motivation, socialization, information exchange, knowledge construction and development. Through the use of synchronous technologies, the professor can begin to enhance the student's online learning experience through additional support and reassurance.

Research Instruments: Evaluating Faculty and Student Instructional Experiences

By focusing on the main themes of the study, interaction, deep learning and e-moderation, it was possible to gain insight from both faculty and students within the university. This was accomplished through survey analysis and focus group venues.

The following questions were used to analyze faculty and student experiences in a measurable way within the study. They formed the basis of faculty and student surveys as well as discussion points for focus group meetings that would follow.

- Where has Adobe Connect been implemented in the classroom and how has this use been of greater benefit than the traditional use of the university's Learning Management System? (Have areas of instruction improved or have new opportunities arisen from Connect?)
- Has student course learning, interaction and satisfaction significantly risen in the areas of the curriculum where Connect has been used?
- Are students performing significantly better in terms of gaining a deeper learning experience in the areas of curriculum where Connect has been used?
- Has the new technology been of benefit to faculty teaching, facilitating and moderating? (Have faculty been able to identify uses for the technology that were not available with the university's existing technology?)

Recommendations were based on both the positive and negative findings of the study. Sample questions used to glen feedback included:

- Was adequate support & training available before the semester started?
- Was adequate student & faculty support available throughout the semester?
- What accessibility issues arose including ADA (American Disabilities Association) Compliance?
- What limitations existed within the technology that affected the class?

The above questions assisted in providing a clearer understanding of how Connect had been used throughout the pilot and where it had been the most successful. Two research surveys were designed in order to collect data from faculty and students. The surveys were created in collaboration with the members of the Center for Teaching and Learning department, who were also interested in a similar study focused on training needs.

Three focus group meetings were arranged with various program directors and faculty throughout the University. These helped give a greater insight into the use of Connect and the issues faced during the pilot. Program Directors, who were responsible for managing a discipline, gave feedback and information at the course level. Faculty members provided information with regards to their individual classroom experiences.

Compiling The Findings

Online surveys were sent to a random sample of 363 students and thirteen faculty members who used Connect during the pilot. The surveys were created for two purposes including analysis of training needs and overall learning experiences Connect provided as an educational tool. The surveys were sent to one section or online classroom of German, Japanese and Spanish introductory language courses, two sections of a Speech course, two MBA classes, two Graduate Distance Education classes, two graduate marketing classes and two graduate teacher education classes. They remained open for a period of two weeks, which allowed students and faculty sufficient time to complete. The results were then compiled for analysis.

The final surveys contained a mix of multiple 'Likert' style questions as well as open-ended questions to gather qualitative data for further analysis. The final analysis excluded the middle Likert scale value or the 'neutral' undecided in order to give a more accurate picture of the final average results. The surveys showed results that were neither overwhelmingly positive or negative. There was however a correlation with students who stated they had an audio learning style to an overall higher satisfaction of the Connect environment. While the results were a little disappointing, some of the strongest areas measured from the surveys were promising. On the Likert scale, the highest satisfaction or level of 'strongly agrees' indicated high overall satisfaction of learner-instructor interaction (4.16). Furthermore results indicated that students were in agreement that their professors were skillful in integrating the use of Connect with learning activities in the classroom (4.0) as well as being able to successfully deliver the curriculum (3.9). These were very promising results as they indicated not only a high level of student-to-instructor interaction, but also that their professors had the skills to successfully deliver content using the Connect environment.

Unfortunately, because of restrictions of the sample number, faculty returned only five surveys. While these five surveys revealed positive results indicating an overall satisfaction of the platform, it was deemed unreliable to base analysis on these alone.

Therefore because of the nature of this research, many of the findings were analyzed qualitatively from focus group meeting results and individual faculty interviews.

The focus group meetings were held with various faculty and support personnel who were part of the pilot program as well as several telephone interviews. The purpose of these meetings was to discuss individual experiences and to reflect on the value Connect brought to online teaching and learning. Each of the meetings focused four topics of discussion.

The first topic for discussion concentrated on the course curriculum, where Adobe connect had been implemented in the classroom and how this had been of greater benefit than the traditional use of the current Learning Management System. (Had areas of instruction improved or had new opportunities arisen?) Student experiences were a very important topic of discussion and part of the second topic, which examined course satisfaction, interaction and trends of learning within areas of the curriculum where Connect had been introduced. Instruction also was examined as a third topic in which Connect had been advantageous to teaching and learning as well as reaching students, supporting admin and information management procedures. Finally, the last topic discussed recommendations and realizations about the platform.

The focus group meetings gave a range of positive and negative experiences within the pilot program. The positive experiences revealed the pedagogical value that the Connect pilot had brought to individual classrooms.   Negative experiences enabled a better understanding of the current weaknesses and problems and, more importantly, where it could be improved. Two individual telephone interviews also took place with professors who volunteered their time to share their own personal experiences.

Analyzing The Findings

In order to understand the findings, it was necessary to investigate the nature of adult education and the study of adult learning or andragogy. White and Bridwell (2004) state that it is critical that educational leaders assess the learner needs and their learning processes before designing distance education offerings. This is extremely important when considering the implementation and furthermore, measuring the success of a technology introduced to an existing classroom such as Adobe Connect. Their following principles therefore apply:

- The diversity of learners, learning needs, learning contexts, and modes of learning must be recognized if the learning activities are to achieve their goals.
- Participation in a learning society involves both rights and responsibilities for learners, providers, and those charged with the oversight of learning.
- Because learning is social and sensitive to context, learning experiences should support interaction and the development of learning communities, whether social public or professional.
- The development of a learning society will require significant changes in the roles, responsibilities, strategies, and activities of provider organizations and personnel as well as of the learners themselves.

The first principle focuses on learning needs in terms of learning styles and fostering a deeper learning approach to education, it is vital to understand these needs. The second principle reflects on moderation, while the last two principles generally reflect on interaction. All are essential ingredients to a successful learning experience where we can begin to evaluate Connect as a Virtual Learning Environment.

<u>Interaction and Connect</u>

"Interaction is one of the most important components of any learning experience (Dewey 1938; Vygotsky 1978). It has been recognized as one of the major constructs in distance education research." (Bharati, 2004). Professors who reported a positive experience, managed to increase interaction within the classroom. The survey results revealed an

overall higher level of learner-instructor interaction as perceived by the student. Chickering and Gamson (1987) discuss the importance of this type of interaction:

"Frequent student-faculty contact in and out of classes is the most important factor in student motivation and involvement. Faculty concern helps students get through rough times and keep on working"

According to Holmberg and Moore, interaction may be a predicating factor for the success of distance education courses. (Kelsey and D'zouza, 2004) Much of the course interactions before Connect, took place solely through the university's Learning Management System. Due to the nature of these online courses, even through the use of asynchronous technology, students could often feel isolated and disconnected from the classroom. The Connect environment opened a new level of collaborative learning within existing courses.

Before Connect, many of the online lecture materials and lessons were published as online text accompanied by learning objects demonstrating different concepts or theories. On occasion, PowerPoint slides were made available with the professor's recorded voice accompanying the content. Connect brought this one step further by making it possible to establish *optional* scheduled live meetings. Those who could not attend were able to watch the recording afterwards. Professors spoke of engaging their students in online synchronous activities and felt that it strengthened the student's perception of the online community. For the first time, students within the classroom could speak and listen to one another in a synchronous fashion, while working through problems or viewing simulations the professor had presented. Even those who could not attend the live sessions had reportedly found the 'recorded' sessions valuable to their learning. Proactive professors developed stimulating, interactive and valuable rich media applications or learning objects that their students did not have before.

Connect has essentially enhanced all three levels of interaction presented by Moore (1989), learner-instructor, learner-learner and learner-content. As revealed from the student survey, learner-instructor interaction was rated as the highest metric analyzed.

Most learner-instructor interaction within existing distance education courses at the university have occurred through asynchronous means. Email and online conferences within the University's LMS has enabled this interaction in the past. Connect added a new level to learner-instructor interaction. Several faculty members stressed the importance of a rich learning environment with regards to synchronous audio capabilities. During one of the telephone interviews in which a faculty member discussed her experiences with Adobe Connect, it was discovered that for her, the overall advantage to using the platform was for oral interaction purposes. "You have to look at how audio helps the learning process. There is extensive research to support this. Most importantly, it motivates! It also caters to students with different learning styles, who may not be as successful in a text-based environment. Another important point is the efficiency of two way audio. Faculty can get content across to the student not only more effectively but also much more efficiently. I can deliver a lecture in a half hour session on Connect that would take pages of text for the student to read through and they may still not get it."

Wenger (2004) talks of the importance of forming communities of practice. He describes communities of practice as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. The concept talks of the benefit of forming a domain or common area or concern of interest. Through interaction within a community sharing ideas within this domain, comes the community of practice, which stimulates the learning process for all involved. Whether this involves problem solving, seeking experience or requesting information from one another, Wenger demonstrates the importance a community of practice can bring to the online classroom. Taking learner-instructor interaction further and applying increased learner-learner and learner-content interaction, we can start to look at forming our own 'communities of practice'. While these communities may already exist in one form or another through online study groups or asynchronous conferences, Connect has proven to enhance the experience further. Within the foreign language programs, oral communication is essential to the student learning process. In order to further enhance the students learning and help with oral pronunciation, practice sessions were made available as optional synchronous meetings with the instructor or Teaching Assistant (TA). Students signed

up for one of the timeslots that the TA provided and attended a real time session practicing the language. These sessions encouraged collaboration among peers as well as learner-instructor interaction. Several professors noted that students would schedule their own sessions and meet to practice their language with other classmates.

Fostering Deeper Learning

"It is students' perceptions of the learning environment that influence how a student learns, not necessarily the context in itself" (Entwistle, 1987). Through appropriate design of instruction and use of tools and methods within the classroom, we can attempt to move those surface students to deeper learners. "The shift from "surface" to "deep" learning is not automatic. Brundage, Keane, and Mackneson (1993) suggest that adult students and their instructors must face and overcome a number of challenges before learning takes place including: becoming and staying responsible for themselves; "owning" their strengths, desires, skills, and needs; maintaining and increasing self-esteem; relating to others; clarifying what is learned; redefining what legitimate knowledge is; and dealing with content." (Willis, B)

The Adobe Connect environment was conducive to deeper learning experiences in many respects. During the focus group meetings, it was discovered that several faculty members used oral communication frequently within the classroom during scheduled sessions. They also enhanced this form of communication through visual demonstration. Some professors found that they could easily share desktop applications on screen to demonstrate fundamental learning concepts such as statistical techniques within various programs. Not only did they notice an increased level of motivation from their students, but they were able to use this new environment to talk about concepts or demonstrate ideas collaboratively. Students were able to build on each others ideas through synchronous sessions, while bringing theoretical concepts to a different level. The community of practice not only developed students in their learning, but also fostered a supportive environment for those who had been struggling with the materials presented inside the LMS. It allowed them to easily 'relate to others' (Brundage, Keane, and Mackneson, 1983) within the classroom and share knowledge. This whole process was

essential to help clarify what was learned, which is important to the adult learner in encouraging a deeper learning approach.

Maintaining and increasing self-esteem is an essential ingredient to deeper learning. The Connect environment allowed additional support that was not available before to students who needed it the most. One professor spoke of several students who did not initially understand difficult concepts within the course. For them it was a repeat class with the enhanced Connect environment that enabled a mechanism for the professor to explain the concepts through audio and visual example in a synchronous session. It was in these sessions that the students finally absorbed the information. "I presented a lecture in Connect and by simply stressing the concept vocally and reinforcing the importance of the subject we were covering, it made a huge difference. I even had a student, who had taken similar courses covering this topic, come to me and say she actually gets it and understands now why this is such an important component of the course!"

John Thomas (2001), in his paper "Audio for Distance Education and Open Learning" talks about the value of integrating audio into distance education and the power it has on the learning experience. He views audio technology as a means to motivate, persuade and add the personal touch to the classroom which can be missed easily through text-based learning.

"They speak directly to their audience in a personal, powerful and persuasive way. They are also extremely effective in terms of teaching and learning – especially when combined and integrated with print and other learning activities." (Thomas, J. 2001)

Over time, it was discovered by these same professors that content could be developed relatively quickly and within the Connect environment. Professors also had the ability to 'upload' other materials and instructional resources to compliment their lectures. This 'rich media' learning in some cases has essentially become a virtual room to store instructional content that the student could access anytime asynchronously. Professors were able to post online materials and examples to assist the student in 'dealing with the content'. (Brundage, Keane, and Mackneson, 1983) The value and potential of this has

only just begun to be realized within the platform as these instructors are finding new ways to fashion content within the Connect environment to encourage their students deeper learning experiences. One administrator within the University stated that essentially students could build a knowledge base of different types of media within the virtual space to form a wiki-style learning environment.

"All sorts of other spaces, such as virtual labs or simulation rooms using live dynamic data, or quiz rooms, possibly containing rich media such as audio or video are possible. In fact, the possibilities are literally, virtually endless. And perhaps most importantly, all can reside under one roof." (Odom, 2006)

Different students learn in different ways. Some learn best through visual demonstration, while others can comprehend more and absorb a lesson better in an auditory manner. Others learn best by taking part in classroom activities, which meet the learning objectives of a course. The environment Connect provides enables the use of many types of rich media suitable to address the different learning styles. Vincent and Ross discuss learning styles and their importance, "By using various instructional media, the online classroom begins to address the various learning styles of its student population." (Vincent, A. and Ross, D, 2001)

Trainers need to be aware of the learning styles of their students so that they can establish alternate ways of teaching identical information to students with differing learning styles.

E-Moderation

"Working online creates a wide range of feelings in students (and teachers, as well) and very often it tends to be the experience of isolation. Isolation has two dimensions. One is distance in place (being alone) and the other is psychological (distance in thoughts, feeling alone)." (Salmon, 2002) We have already established that interaction is an essential ingredient to successful online learning, however taking this one step further we can explore the concept of e-moderation. "According to Salmon, an e-moderator is someone who presides over an electronic meeting, thus e-moderation is the work done by a moderator online." (E-Moderation, 2006)

It was revealed that Connect has not only added to the overall learning process based on interaction and deeper learning experiences, but it has also provided instructor opportunities both asynchronously and synchronously. Before Connect was available at the University, all classroom discussion, collaboration as well as moderation took place through the LMS conferencing tool. Similar to online Internet forums, the conferences allow for asynchronous threads of discussion. Salmon (2000) identifies a 5-stage model for learning online with regard to E-Moderation:

1. Access and Motivation
2. Online socialization
3. Information exchange
4. Knowledge construction
5. Development

The stages represent milestones which the online learner passes as they become more engaged with the class. The amount of interactivity generally rises as they pass each phase until they reach Development where they return to more individual pursuits. Generally the professor within the asynchronous conferences of the classroom should support these stages of the model, however the value of moderator support was brought to realization through the use of Connect. In his motivation theory, Malone (1981) discusses sensory curiosity whereby he assets "this type of curiosity is aroused by visual or auditory effects that are surprising or attract attention." (Alessi and Trollip 2001) In both synchronous and asynchronous settings, Connect can therefore begin to stimulate sensory curiosity through its rich media delivery. While it is true, synchronous delivery cannot be mandated within any required course, the use of this form of communication and collaboration cannot be eliminated entirely. Various professors have indicated that they have indeed successfully delivered synchronous sessions within their classrooms. These sessions have worked as extras or additions to regular collaboration and moderation within the conferences, which students have had the option to attend. One faculty member insisted that the weekly sessions held had actually encouraged students to engage more within the classroom, increasing their knowledge construction and overall

information exchange (Salmon, 2002). The Connect sessions have also had a positive effect with students in regard to online socialization, where they have had the opportunity to talk directly to their peers synchronously. Those students who could not attend the session had the ability to watch the recording at a later date. There are two very important advantages to using synchronous delivery within the online classroom, immediate feedback and an overall increased level of motivation.

"Immediate feedback can be provided to students so that they can immediately correct themselves or strengthen what they have learned. This is especially essential for activities such as group decision making, brain storming, and analysis (Hotcomm, 2003)." (Chen N. S., Ko H.-C., Kinshuk and Lin T., 2005)

One professor held scheduled review sessions where her students could interact, ask questions and listen while concepts were explained that they didn't understand from the text. "With a synchronous environment, the student can virtually 'raise' their hand any time they may have a question. In the asynchronous environment, they may read something and think at the time they should email the professor about this later and when later comes they have forgotten all about it." She would ensure that the students were at a level of understanding the necessary material for that section of the course. Furthermore, students who could not attend could not only watch the recordings after the session, but also submit questions to be covered during the next event.

"Increased level of motivation and an obligation to be present and participate which in turn would increase students involvement in learning activities, hence resulting in better learning experiences (It-analysis, 2001)." (Chen N. S., Ko H.-C., Kinshuk and Lin T., 2005)

Several professors spoke of how they believed their students became more motivated through these online synchronous sessions within the Connect environment. One professor even acknowledged that his student evaluations had gone up, however this could have resulted from any number of variables. Overall however, it has certainly been apparent that synchronous learning through the Connect environment has been advantageous to online learning.

Recommendations: Acceptance of Adobe Connect as a VLE

The positive educational experiences revealed from the research reflected those classes where professors spent time exploring the educational possibilities of the platform. Many of UMUC's professors are part time or adjunct faculty and are scattered across the world. It is difficult for these professors, who are quite often working professionals, to learn new technologies, especially if they do not consider themselves comfortable with new technology in general. Carter, J and Titzel, J (2003) revealed in an article on adult education that while it is exciting that teachers are using technology in so many interesting ways, it is sobering to see that well over a decade after the personal computing revolution, few teachers reported feeling highly proficient in many common educational uses of technology.

There has been extensive research over the years on barriers to new technology and the Technology Acceptance Model (TCM). McKenzie (1994) discussed strategies for moving from technology refusal to technology acceptance. He highlighted the importance of continuing to raise standards but also to clarify purpose. As with Knowles (1984) who argues that adults need to understand the purpose of why they are learning something new, it is essential to communicate why a new technology is needed for faculty. McKenzie also discusses 'personalizing the journey' that educators have to new technology by ensuring the essential networking or community support is in place to assist in training as well as addressing essential questions to educational challenges or problems.

The recommendations that follow fall into four categories that attempt to address some of the shortcomings the pilot in terms of acceptance as a Virtual Learning Environment to enhance classes at UMUC.

1) Fostering Awareness and showcasing Connect 'success stories'
2) Training to focus more on pedagogy and best practices
3) Course development of pre-made Connect learning objects
4) Technology limitations and Accessibility Recommendations

<u>Showcasing and Fostering Awareness</u>

Pro-active faculty members who successfully integrated Connect into their classrooms produced very positive results. They used the platform for different learning events including scheduled 'review sessions' to discuss classroom issues. They also successfully demonstrated application sharing for such classes as statistics to explain complex concepts. Team level assignments and tasks were integrated, which received positive reactions from students. Students from the foreign language programs were able to schedule optional speech vocabulary practice in the language they were learning from their professors and TAs. These positive 'success stories' were revealed by only some of the faculty, while other less successful experiences occurred when Connect was used for functions it was not best suited for. Perhaps had these faculty members been aware of the other 'success stories', they might have gained a better understanding of its potential uses. Better yet, it may have given them ideas to pass on to other professors in their field of study.

During the focus group meetings, it was argued by various instructors that there were alternative tools for some of the uses that Connect had been adapted to, especially within the foreign languages courses. The Connect environment can be used for many different instructional purposes. It was however apparent that if it did not meet a specific need or set of needs within a program or course, it was easily dismissed. In one case, a foreign language professor was highlighting a specific need; the recording of audio oral exams and tests for student submission. While Connect has the functionality to make multiple small sound recordings for oral submission, it may not be the ideal tool solely for this use. Had that professor been aware of other potential instructional uses that the tool offered, she may have realized other far more effective uses within the classroom.

The solution is to showcase the best pedagogical examples of Connect within various online classes. To have a central resource where these experiences could be shared with others in the university would certainly have a positive influence on the platform. An online repository could easily be setup showcasing the best examples of instructional design within the traditional LMS classroom enhanced through the additional use of

Connect. Presentations could be arranged for program directors to demonstrate these showcases, which would explain exactly what Connect is, and more importantly what it could do for them. Such showcases would highlight the importance of the educational themes discussed throughout this paper.

Training as a Virtual Learning Environment

One professor spoke of best practices when considering Connect for a course. "In terms of pedagogy you need to forget about the individual features one application or another may have. You need to think about it the other way around. What would you like to have within your classroom to improve the overall instruction and student learning?"

Early in the pilot, small training classes were delivered through the Center for Teaching and Learning for those faculty members who were planning on using Connect. Initially the training sessions were two hours in length concentrating on basic functionality. As the pilot progressed, further training modules were developed for more advanced uses. Much of the material however focused on using the various tools within Connect to either schedule live sessions or produce basic asynchronous content.

To take this one step further, training modules should be designed to communicate the pedagogical value of using Connect. While the training courses evolve, sessions should be designed to demonstrate effective best practices for using Connect as a VLE. Such training should emphasize the value of synchronous learning while at the same time demonstrate the asynchronous instructional potential. By focusing on learning theories and instructional design, professors and program directors will begin to develop content that will essentially enhance online educational experiences.

Course Development of Pre-Made Connect Integrated Classrooms

Faculty time in learning a new technology to deliver instruction can be limited. Many online courses at the University are developed within the Office of Instructional Support and Services (OISS). Instructional designers work with content experts to craft and revise courses on an ongoing basis. During the pilot opportunities were discovered with asynchronous learning and rapid learning object development within Connect.

Suggestions were made to pre-build courses or learning objects for Connect ahead of time for specific academic programs. Course developers and instructional designers from OISS could work closely with content experts to craft an integrated course. Asynchronous flash-based learning objects could be deployed into the Connect environment built for specific academic disciplines. These learning objects could comprise of interactive instructional components and other media meeting the learning objectives of the course. Initially this could be developed for one or two courses that may span several sections or classrooms and if successful, this model could be adopted within other such courses. These select classrooms would become part of an expanded Connect pilot. Further research could then be carried out to measure their overall effectiveness. Hirumi (2002) highlights the importance of sound educational principles, cognitive learning theories and grounded instructional strategies to inform course design and sequencing of activities to ensure effective interactions, thereby, making learning relevant, meaningful and authentic." (Kidney, G, 2006) Additionally, TA's or Teaching Assistants could be assigned to these classrooms so the professor could concentrate on their instructor role, while the TA would take care of the technology.

Technology Limitations and Accessibility Recommendations

There were some technical issues that were revealed during the study comprising from minor corrected bugs to larger issues. Audio quality was one of the biggest concerns for many faculty members throughout the pilot. Unfortunately the technology Connect uses for audio can often be problematic depending on bandwidth usage. One solution for this was to limit the number of users with audio capabilities in any one session; however this was obviously not the best approach. The university should invest in purchasing phone bridge technology that would integrate with Connect. This would allow all users to call into a session through a regular telephone. The overall quality would increase greatly and students and faculty using audio-conferencing would not have to purchase headsets or other such equipment.

Account creation procedures for the pilot was a manual process and administered by support personnel within OISS. This was certainly not a scalable solution as it would

took a great deal of time to manage from an administrative standpoint. Ideally the answer would be to integrate the SCORM functionality of Connect with the University's own LMS. "SCORM is a collection of standards and specifications adapted from multiple sources to provide a comprehensive suite of e-learning capabilities that enable interoperability, accessibility and reusability of Web-based learning content." (SCORM 2004, 3rd Edition, 2004) This would ensure interoperability between Connect and the University's automated LMS account creation process. In order to avoid glitches or other such issues with the server, it would be an ideal solution to move Connect in-house with the University's IT department supporting and managing the software.

Another technical issue that arose was accessibility concerns. UMUC has to be extremely careful to cater to all students regardless of disabilities or other accessibility issues. Therefore any instructional material online should be reachable by all users of the class. "Accessible Web design is the process of ensuring that users are able to use a Web resource—such as a class Web site—without further modification, regardless of abilities and disabilities." (Accessibility in Distance Education, 2005) If online sessions were held in classrooms using the Adobe Connect environment, it would be critical to understand the affect it may have on students with disabilities. Adobe has been developing solutions to help address accessibility within the Connect environment including the Adobe Acrobat Connect Meetings Captioning Extension, which enables meeting organizers to "deliver professional closed captioning within their meeting environment." (Creating Accessible Adobe Acrobat Connect Professional Meetings, 2006) This tool also is available for hearing-impaired attendees ensuring Section 508 compliance.

"Section 508 is a part of the Rehabilitation Act of 1973, which requires that electronic and information technology developed, procured, maintained or used by the Federal government be accessible to people with disabilities. States which were recipients of Federal funds under the State Tech Act Grant must also comply with the Access Board standards for Electronic and Information Technology." (Section 508, 2007)

It would be recommended that the pilot committee research accessibility needs in general and consider implementing some of the technological solutions that are available.

<u>Final Thoughts</u>

Since Adobe Connect was first introduced, it had a stigma attached as it was considered a pilot. There have been other pilots in the past where various technologies have been tested and reviewed over a period of time. This has ensured that the University has stayed on the cutting edge of newer educational technology. Unfortunately there is also a down side to this including concern among faculty members with continuity. Program directors shared their concern that much time and resources with regards to training and preparation was needed. It was sometimes difficult to 'sell' this new technology to their faculty since there was no guarantee that it would be around in the future. Why spend time and resources training personnel if the pilot ultimately fails and is not implemented? This was a difficult issue when no guarantee was given the Adobe Connect would be around indefinitely. UMUC cannot however guarantee that any technology will be around for a long period of time due to its very nature of being an online University. Ultimately in such an environment, if the educational institution did not embrace change it would surely flounder.

The research study revealed three important educational themes consisting of interaction, fostering deeper learning and e-moderation. The impact Connect made within each of these areas demonstrated its role within the various models of teaching. While acceptance to this new technology or VLE has been a challenge, it was critical to examine 'why' it was essential to successful teaching and learning experiences. The findings demonstrated the value the Adobe Connect pilot brought to the University. The issues and shortcomings have in turn demonstrated where change is necessary. The recommendations, if implemented, would provide a positive way forward. More research would be required in the future depending on what path the pilot would take. This may take the form of testing newer Connect-based classrooms measuring for success metrics or a further case study analysis on the next phase of the pilot. It may be deemed necessary to discontinue Connect completely in favor of some other such technology, which fits this role better. No matter which course of action is taken, UMUC will no doubt continue to strive for leadership by being on the forefront of emerging technology to support its ever-growing online student community.

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