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Adding Modern Technologies
To Web-Based Distance
Learning Courses

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Abstract

This report gathered data on the introduction of new technologies into web-based distance learning courses. Faculty of the Advanced Distance Learning Network and staff at the Academic Technology Center were interviewed to gain their opinions and concerns about distance learning. In addition, students who had already taken distance learning courses were surveyed. I present all of these data as well as results that support the use of video iPods as a way to enhance distance learning courses.

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1 Introduction:

A trend that has emerged within the past few years has been for colleges and universities to offer students the option of taking their required courses online rather than through the conventional means of on-campus instruction. Although this option has benefited many students because it is often more convenient and flexible, it has, however, come at some cost to the learner. Researchers have spent a lot of time trying to identify both the advantages and disadvantages of distance learning courses. One important concept that has emerged out of this research is the idea of social presence, or “the ability of learners to project themselves socially and emotionally in a community of inquiry” (Stodel, Thompson, MacDonald, 2006). Many analysts have identified this as the key ingredient missing from distance learning classes, which explains many of the problems experienced by students. The deficiency in physical human interaction throughout these online courses has tended to leave the students feeling disconnected with their teachers and peers within their virtual classroom.

Ideally, all relevant available technologies would be instituted to address this social presence issue in distance learning classes, and emulate, to some degree, the face-to-face classroom interactions between students and professors. Numerous technologies exist that could have important implications in addressing this instructional gap. Before implementing these technologies however, one must consider that students must first be capable of using them. In order to take full advantage of these technologies, ideally every student would be completely competent in all technologies identified as useful in the distance learning process. In addition, while investigating new technologies, it is important to take into consideration the reason why students choose to take online courses in the first place. It is important not to go too far and implement technologies that would completely imitate the classroom learning processes since if technologies impose the same in-classroom practices into distance learning classes, they would take away the qualities that are most appealing to students desiring the distance learning experience.

Over the past few years, substantial research has been done in the field of distance learning to try to identify many of the issues that negatively impact students’ learning ability while taking online courses. Students in Canada have suggested that there is a serious lack of social, cognitive, and teaching presence in distance learning courses (Stodel, Thompson, MacDonald, 2006). When compared to in-classroom learning, students felt online dialogue tended to be less appealing because the discussions were often not as spontaneous or improvised. Another key facet students missed about being in the classroom was the ability to meet and form new relationships with people. If distance learning is to be improved, these issues will have to be addressed by forward thinking that employs technologies as a means to solve these problems.

From the students’ responses, the University professors Stodel, Thompson and MacDonald developed a relatively straightforward guide to assist future professors in improving some aspects of the distance learning process. Five general themes emerged from their comprehensive study; creating opportunities to enhance spontaneity, training

students how to learn online, exploring technologies to enhance social presence, explicitly outlining learners' expectations of the online community, and understanding the diversity of learners in an online environment (Stodel, Thompson, MacDonald, 2006). This study was beneficial to my research because it points out the key areas that need to be addressed when designing a distance learning course. My research explored these areas further and identified technologies that could be used to improve the overall social, cognitive, and teaching presence.

The goal of this project was to discern information on possible solutions to the problems existing within the virtual classroom, namely bridging the social and emotional gap between student and professor through the use of new technologies. In effect, these solutions will help to create a new kind of social presence for students and instructors within the realm of cyberspace. This ultimate goal was accomplished by fulfilling the following objectives; one: address distance learner concerns with respect to social, cognitive, and teaching presence; two: look into course development and student assessment issues; and three: investigate the appropriate technologies to add to distance learning courses. These technologies will later be implemented into two upcoming summer courses here at WPI.

2 Background:

Background information deemed relevant to the improvement of the distance learning process will be addressed in this chapter. Section one will look at the concept of presence in the context of learning. Student and teacher presence has been identified by many researchers as being critical to a successful learning experience. The second section explores how to evaluate quality of online courses, as well as methods used to assess the learner's academic performance from a distance. In the third section, the important aspects of methodology for distance learning course development are introduced. Last, there will be a section devoted to the topic of emerging technologies in the distance learning field.

2.1: Social, Cognitive and Teaching Presence

An emerging theme in the distance learning field is the idea of *presence*. Social presence can be defined and interpreted in a number of different ways. As cited in Stodel, Thompson, and MacDonald, social presence is “the degree of salience of interpersonal experience” (Stodel, Thompson and MacDonald, 2006). Similarly, Shin defines social presence as “feeling intimacy or togetherness in terms of sharing time and place” (Shin, 2002, qtd. in Stodel, Thompson and MacDonald, 2006). In essence, this fundamental concept is meant to establish whether learners feel like they have the ability to interact with their peers and teachers by participating and belonging.

Another kind of presence that has proven to be an important concept in distance learning research is the idea of cognitive presence. Merriam-Webster's dictionary defines cognition as “an intellectual process by which knowledge is gained from perception of ideas” (Webster, 2007). In the field of learning research, cognitive presence is often defined as “the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry” (Garrison, 2000, qtd. in Stodel, Thompson and MacDonald, 2006). In an additional paper, Mustafa states that although there may be huge fundamental differences between distance learning and conventional face-to-face classes, cognitive characteristics are imperative to successful learning of any kind (Mustafa, 2005). This means that the ultimate outcome of a learning experience is greatly dependent on what the learner brings to the table and contributes to his or her classroom, real or virtual.

Additionally, research has shown that social presence contributes to cognitive presence. The results of a study by Jolivette found that social presence directly related to a student's ability to retain important information throughout a course, demonstrating that social presence and cognitive presence go hand in hand (Jolivette, 2006).

The third kind of presence identified as important to learning is teaching presence. This is defined as the ability of a person to project themselves as an instructor, establish the course content, and accommodate student needs. The instructor facilitates his or her teaching presence by providing content and subject matter for the course. Another way an instructor possesses teaching presence is through access to unique learning materials

not available to students. It is also pertinent in an online learning environment that an instructor clearly defines the learner's objectives, designs an adequate student support system, and creates an effective feedback system. When exerting teaching presence, it is up to the instructor to choose the various media formats that will be used in aiding instruction and organize the course in a manner to assist in self-directed learning (Stone and Chapman, 2006).

2.2: Evaluating and Assessing Distance Learning

Many questions arise as to what criteria should be incorporated into the evaluation of distance learning courses. Researchers Hew, Liu, Martinez, and Bonk (2006) have broken down the evaluation of distance learning courses into three levels, macro, meso, and micro. Macro-level evaluation can be described as the evaluation of an entire online education program. This overall evaluation can be used as justification for the investment of resources and to provide a measure of the total progress of a program's objectives. Meso-level evaluation is described as the process of evaluating individual online courses. Most often the course instructor will be evaluated by both students and faculty based on how well course objectives, expectations, and assignments are outlined. Also pertinent to meso-level evaluation is the overall level of support received by the students such as encouragement in participation, learner-instructor contact, and interaction and collaboration between learners. Micro-level evaluation is the actual evaluation of the learners themselves by their instructor. This judgment is based on the learner's perceived learning experience, the process they used, and the outcome from the online course (Hew, Liu, Martinez and Bonk, 2006).

Researcher Garcia used a similar evaluation process to analyze 34 statements made by students to judge the quality of their distance learning experience. She found that courses taught entirely at a distance held the lowest mean scores in most of her evaluating categories when compared to both traditional courses taught in the classroom and hybrid courses taught with a mix of traditional and web-based learning. In the category of "Satisfaction", which is a macro-level evaluation, distance learning held a mean score of 3.59 out of 5, while tradition and blended learning had mean scores of 3.95 and 4.21 respectively. Some of the subcategories of "Satisfaction" included the learner's preference, excitement, worthiness of time, and enjoyment of studying. In addition, "Instructor Support" was rated by the students, which is a meso-level evaluation. Here Garcia found that distance learning again held the lowest mean score of 3.62 while traditional and hybrid learning held a score of 4.68 and 4.66 respectively (Garcia, 2006).

Additionally, researchers Kerka and Wonacott (2000) found learner assessment to be an important aspect of any type of learning. Learner assessment gives the instructor information about the overall progress of students and acts as a way to measure the achievement of learning goals. In distance learning, the means by which learning assessment is accomplished becomes even more critical. Kerka and Wonacott found several disadvantages of assessing students at a distance: learner isolation due to the impersonality of computerized assessment, lack of instructor control over assessment

conditions, uneven access of learners to technology and resources, technical problems, and variation in instructors' technical skill levels. Also in this study, many types of online assessments were clearly identified such as: critical thinking, problem solving, demonstrating techniques, self-management, information access/management, demonstrating knowledge, designing / creating, communicating, and teamwork (Kerka and Wonacott, 2000).

2.3: Course Development

The methodology chosen to develop and use throughout online courses is an integral part of creating a successful distance learning experience, and thus has been looked at extensively by many studies. In a research paper by Cacheiro, Rodrigo, Laherran, and Olmo (2006) of the Spanish National Distance University, several different concepts and methodologies commonly used in distance learning courses were outlined. Additionally these were incorporated and used as guidelines to create their own distance learning model which serves as a template to create online courses. Some of the ideas and methodologies they used include a “Modes of Interaction” model presented by Anderson (Anderson, 2003, qtd. in Cacheiro, Rodrigo, Laherran, and Olmo 2006). This model describes the six types of interactions that take place through either synchronous or asynchronous online communication (Student/Content, Student/Teacher, Student/Student, Teacher/Content, Teacher/Teacher, Content/Content). A diagram of this underlying concept is located in the figure below in *Figure 2.1*:

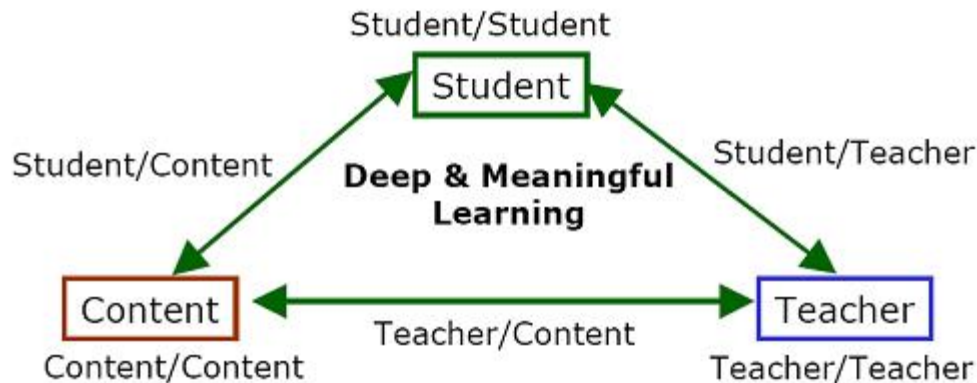


Figure 2.1: Modes of Interaction

Another well-known model by Garrison, entitled “Communities of Inquiry”, is referenced in development of their own model (Garrison, 2003, qtd. in Cacheiro, Rodrigo, Laherran, and Olmo 2006). The “Communities of Inquiry” model describes how the three types of presence (social, cognitive and teaching) are critical in understanding the function of a successful community of any kind. Below *Figure 2.2* shows these overlapping elements:

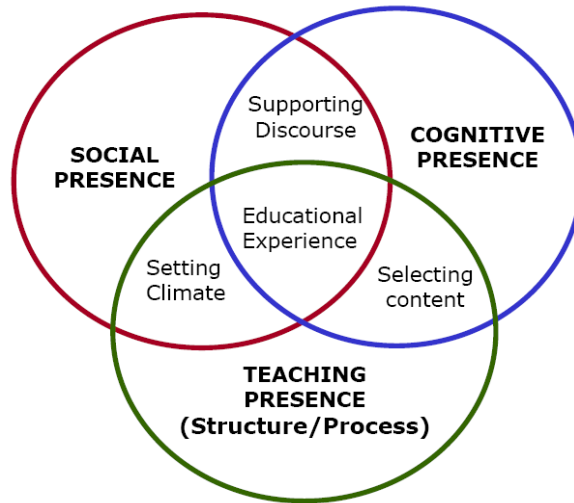


Figure 2.2: Communities of Inquiry Model

The model the University developed using these previous models is called the UNED Blending Learning Model (Figure 2.3). This was designed as a way to directly analyze the methodology used from the instructor’s point of view in creating online courses. Through using all of these well-known, highly praised models as guidelines, the authors developed a new kind of course organization template to help assist instructors in creating interactive online courses. The emerging theme here is that the use of templates in outlining a general structure for online courses is vital for instructors aiming to create a successful online learning environment (Mariluz, Rodrigo, Laherran, and Alicia, 2006)

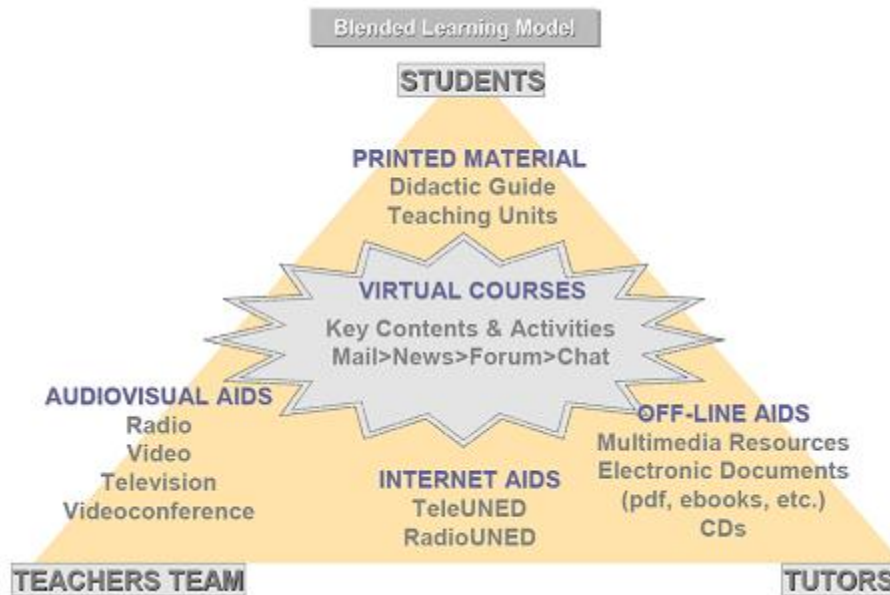


Figure 2.3: The Blended Learning Model at UNED

2.4: Emerging Technologies

New emerging technologies can contribute to improving distance learning. The first technology mentioned is videoconferencing, a computer-based communication medium that allows real-time audio/visual conferencing. Next, podcasting and video-podcasting is discussed as a means of broadcasting and sharing audio and video files over the internet to listed subscribers. Streaming video as it pertains to distance learning education is then explained. Finally, web 2.0 mediums allowing users to easily alter web pages and post information are discussed, namely wikis, blogs, and flickrs

2.4.1 Videoconferencing

A comparison study by Kuo discusses the pros and cons between traditional, distance, and videoconference-based learning for several different categories. This study found that videoconferencing received the lowest amount of positive feedback in just about every category analyzed by 311 Texas A&M students surveyed. Videoconferencing received the lowest percentage of overall satisfied students, 59.1%. Another category in which videoconferencing had the lowest score was peer-to-peer relationships. Many of the students felt that videoconferencing was an ineffective means of communication. Another interesting point brought up in the study was that faculty members involved in videoconference-based learning experienced a course load almost identical to that of teaching a traditional course (Kuo, 2003).

2.4.2 Podcasting

Another recent technological advance that has been researched in the context of distance learning is podcasting. Mark Lee and Anthony Chan (2007) define podcasting as the exchange of radio type audio segments with members of a distance learning class. In their research, this audio was used throughout the course as a way to combat the effects of isolationism that students felt and give them a newfound sense of inclusively. The structure of their podcasting consisted of a series of three and five minute audio clips being distributed on a regular basis throughout the course. Through qualitative and quantitative data analysis of this technology, the researchers found that all of their before mentioned goals were met. In addition, the students also found podcasts to be an effective means of clarifying and understanding the subject matter (Lee and Chan, 2007).

2.4.3 Video-Podcasting

Video-podcasting works much like its audio counterpart, but instead of users downloading audio files, digital video files are exchanged. Users can download or stream the files from a web server. The benefits of having users download the videos are that the files can be watched as many times as desired from a single download, reducing bandwidth usage. Users can also watch the videos without being connected to the internet on either their PC or on some other portable media player such as a video-iPod. On the other hand, streaming podcasting has the advantage of allowing users to begin

viewing the video before the file has been completely downloaded. In the field of education, video podcasts enable students and teachers to exchange instructional videos seamlessly over the internet (Wikipedia, 2007). These videos can communicate useful information such as supplements to curriculum, class assignments, student oral presentations, and pertinent interviews.

2.4.4 Streaming Video

Streaming video on the internet is another technology that has recently been added to some web-based distance learning courses. Streaming video can be defined as video transmitted continuously over the internet into an appropriate playback program for instant playback. In a recent study by Cofield (2000), this technology was assessed for its value in aiding web-based instruction. It was found that many different colleges and universities used streaming video technology as a means to transmit conventional lectures electronically. Cofield found that the majority of students felt they learned more with the video clips than without them. That is because this technology offers some major benefits over regular video files that had to be downloaded. The first advantage to streaming is the ability of users to start watching the video before the entire file is downloaded. Another benefit to streaming video is the ability of the host server to adjust the data transmission rate to suit the user's connection speed. Because of all of these benefits, many schools, such as Cornell University, have chosen this technology over conventional downloadable video files (Cofield, 2000)

2.4.5 Wikis

The use of websites such as Wikipedia.org to post wikis on the internet is another example of a technology that poses many possibilities of improving distance education in the future. In an article by Taylor and Metzler (2007), wikis are described as being web pages which users themselves have the ability to modify by adding, removing, and changing content. These authors also found another definition that states a wiki is a piece of server software that allows users to edit web pages content through the use of any web browser. This web-based software is easily learned by users because it uses a simple computer language that supports hyperlinks, making it very accessible to novice users. Thus, these web pages serve as an effective educational tool allowing for multiple persons to collaborate on the authoring of information that is widely available across the World Wide Web (Taylor and Metzler, 2007)

2.4.6 Blogs

Web-blogging is a technology that could help lead to a more fulfilling distance-learning experience. In an article by Ray (2006), the use of educational blogs (edublogs) was looked at as a means to improve education. She describes blogs as being analogous to a bulletin board, and easy enough to create and use as an email account. Once set up, users can quickly and easily post new text information intended to be shared with target audiences. Ray came up with a variety of different uses for blogs within the field of education. She found when edublogs were used as an electronic bulletin board they

provided a fast and efficient means of communication. Edublogs can also be used as an instructional resource for students, providing easy access to instructor insight on assignments and other academic issues. Ray found that edublogs could also be used as a collaborative tool for students when working on projects, allowing students to create a unique blog dedicated solely to their assignment. Lastly, she found edublogs to be a premier venue to showcase student projects as they allowed teachers, and students to easily browse over student created materials (Ray, 2006).

2.4.7 Flickr

A new website named “Flickr” may also have a variety of uses in the field of distance learning. According to Chase (2007), Flickr.com offers users, the ability to store, index, organize and share digital images. All of these functions are carried out within a smart online community in which after signing up for a free account, users take control of these accounts by indexing images based on their subject matter and adding their own descriptions to the images. This allows the Flickr search engine to return all relevant search results and guide users to their desired photos fairly easily. Chase explains that this technology in turn can act as an educational data bank in which numerous digital images can be stored and accessed by anyone. This would allow students to record, preserve, and share images of various educational activities (Chase, 2007)

3 Methodology:

The goal of this project was to investigate emerging educational technologies to determine whether or not they can improve the distance learning process. This chapter outlines the methods used to gather pertinent information on current issues in distance learning as well as the possible implementation of new technologies into distance learning courses. First, the steps taken to uncover the issues concerning social, cognitive, and teaching presence are discussed. Then methods used to gain information about course development and student assessment issues are described, and finally the procedure for investigating emerging technologies is outlined.

3.1: Exploring Social, Cognitive and Teaching Presence Issues

In this portion of the study, students and instructors were given the opportunity to express their opinions concerning distance learning. A questionnaire survey was created following Garcia (2006), and then distributed via email to distance learning students who had already completed at least one online course here at WPI. A total of four students responded to this survey. Questions on this survey addressed issues of social, cognitive, and teaching presence. The survey used for the students can be found in Appendix E.

Advanced Distance Learning Network (ADLN) instructors were also interviewed regarding their perspective on presence issues in distance learning. Instructors known to be involved with WPI's ADLN who have taught or are currently teaching distance learning courses were contacted. Instructors who responded to an initial email agreeing to a 30 minute interview were then interviewed face to face. Five ADLN instructors were interviewed. The ADLN interview questionnaire can be found in Appendix F.

These data obtained from these surveys and interviews were analyzed and used to identify specific issues about presence in distance learning that students and professors are dealing with at WPI. In addition, these data are used to support conclusions about new technologies to address these issues and improve distance learning at WPI.

3.2: Looking into Course Development and Student Assessment

In addition to wanting to obtain information on presence issues, another purpose of the ADLN interviews was to obtain feedback from instructors about online course development and student assessment issues. During the interviews, instructors answered questions regarding course development issues and student assessment. Data were gathered for the purpose of finding new educational technologies that could help instructors better address problems relating to developing their online classes as well as assessing students' performance. Again, the ADLN interview questions can be found in Appendix F.

3.3: Investigating Emerging Technologies

In order to investigate emerging technologies, authorities were actively sought out for information in this field. Staff from WPI's Academic Technology Center were contacted by email, and those who agreed to a 30 minute interview were interviewed face to face. During the interview, questions were asked regarding current technologies in use at WPI as well as future technologies that could potentially be used. Questions regarding the feasibility of implementing these candidate technologies were also asked. The purpose of these interviews was to gather information that could be used to support a conclusion about what technologies were useful in WPI's distance learning courses and whether future technologies existed that could help improve distance learning at WPI. A total of three ATC members were interviewed. The questionnaire used for these interviews can be found in Appendix G.

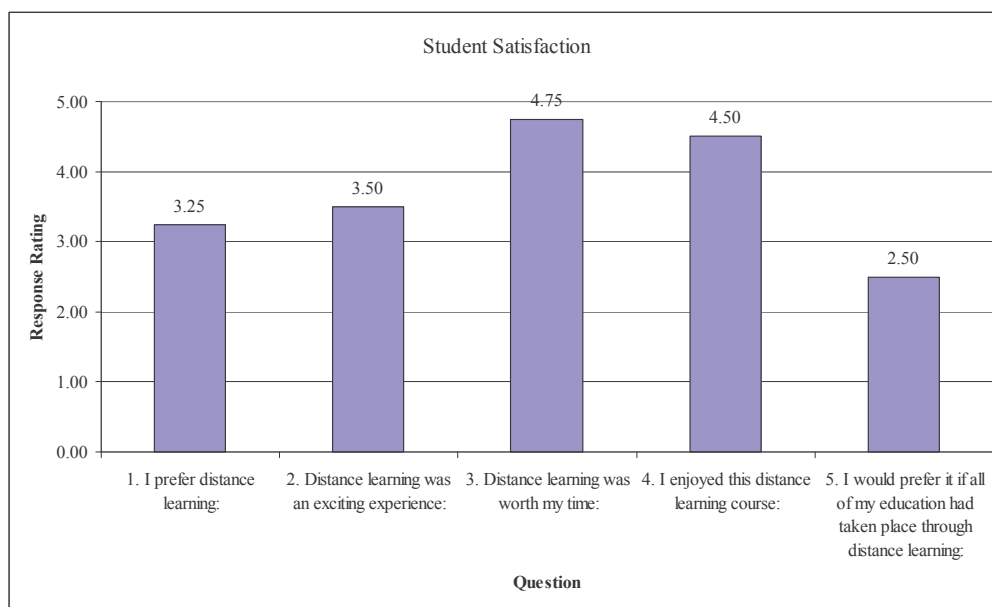
4 Results and Analysis:

This chapter uses the information obtained through the ADLN and ATC interviews, as well as student surveys to analyze and draw conclusions about current issues in distance learning and possible technologies that could improve distance learning in the future. The goal of this project was to gather data on current issues within distance learning specifically relating to presence, course development and assessment. From this data, as well as information gathered on emerging educational technologies, it could ultimately be determined whether new technologies could improve the distance learning process. These results of this investigation follow. To test the hypothesis that these technologies actually do improve distance learning, the technologies will later be implemented into two upcoming courses being held in the summer of 2007.

4.1: Exploring Social, Cognitive and Teaching Presence Issues

Overall students expressed strong satisfaction with their distance learning courses at WPI. *Figure 4.1* shows that students strongly felt that the distance learning process was worth their time and they had an enjoyable experience. However, there are issues with distance learning that both students and instructors mentioned. The ADLN instructor interviews and student surveys obtained a good sense about how instructors felt about the presence issues they experienced while instructing their distance learning courses and how students perceived these issues in their online courses. Each professor had their own unique expectations and desired outcomes for their distance learning courses, and thus their perception of presence issues varied. Interestingly, issues concerning social, cognitive, and teaching presence differed from department to department.

Appendix H lists the full results for the student surveys.



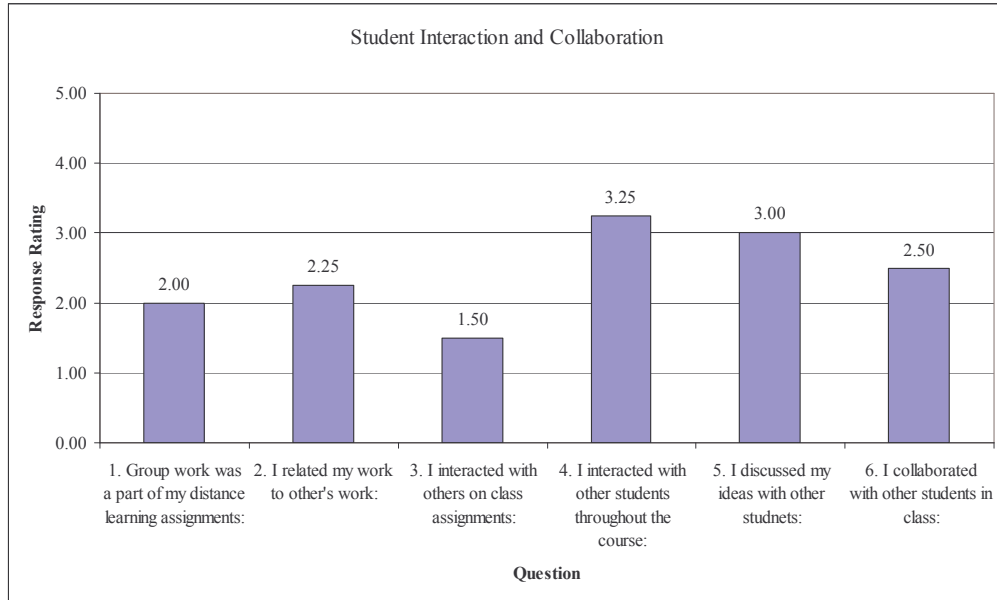
| |
|--|
| Key for Response Rating: 1 – Never 2 – Seldom 3 – Sometimes 4 – Often 5 – Always |
|--|

Figure 4.1: Average Student Response for Student Satisfaction

4.1.1 Social Presence

One of the reasons students may take online courses is because they cannot commit to a synchronous schedule. Because the ADLN courses are built on the principle of “asynchronous communications”, it is often difficult for students to physically interact with each other or their professor. This creates a lack of social presence in distance learning classes that many students and instructors pointed out as the biggest problem in their online courses. Some faculty explained that if there was perhaps some additional synchronous communications taking place, there could be a more successful learning experience on both ends.

The student surveys indicated that students did not interact with each other very much during their distance learning course. *Figure 4.1* below, shows that the average student response for the questions concerning “Student Interaction and Collaboration”. For the first question, “Group work was part of my learning assignments”, the average student response was 2 out of 5, showing that students seldom worked on assignments in groups. For the question “I related my work to others work”, students responded similarly with a score of 2.25 showing that students seldom related work to others. For the question “Interacted with others on class assignments”, the average response was the lowest out of the six questions with a 1.5 showing students rarely collaborate on assignments. The response for “I interacted with other students throughout the course” was more than double the previous question, 3.25. This shows that while students seldom or never interacted on assignments, they still sometimes interact throughout the course. This may mean interaction online or through discussion boards. Similarly, the average student response of the next question “I discussed my ideas with other students” was 3. For the last question, “I collaborated with other students in class” the response was 2.5 out of 5. This response was slightly higher than question one, which is to be expected because students collaborated not only on group work, but also on other assignments. Overall, the students responses indicate very low social interaction and collaboration between students. This indicates a lack of social presence in distance learning.



Key for Response Rating:
 1 – Never
 2 – Seldom
 3 – Sometimes
 4 – Often
 5 – Always

Figure 4.2: Average Student Response for Student Interaction and Collaboration

Similarly, instructors reiterated student’s opinions on the lack of social presence in distance learning courses. Within the Management department, ADLN instructors found that social interaction between themselves and their distance learning students was almost non-existent. This creates a particular problem as Management courses frequently teach skills that are tough to acquire through distance learning. These include leadership exercises, which rely on communications other than writing such as speaking, facial expressions and body language. One professor explained the importance of the dynamic of being among other learners that are also participating in the same exercise. This allows students to gain much needed peer feedback, which has been found to accelerate these types of leaning activities.

A variety of professors expressed their concerns about group work in distance learning courses. Some professors attempted to have students perform some group exercises, but found that that it was a very daunting task. The groups often fell apart because of the asynchronous aspect of distance learning. Unlike on campus courses, there were no visible clues showing that the groups were falling apart. In other cases, professors had given their students the option to work on assignments in groups and found that for the most part students would elect to work independently. However, some students would successfully work together on group assignments if they were in the same

geographic area. This shows that students may want to work in groups but it is often near impossible given distance barriers and lack of social interaction between learners.

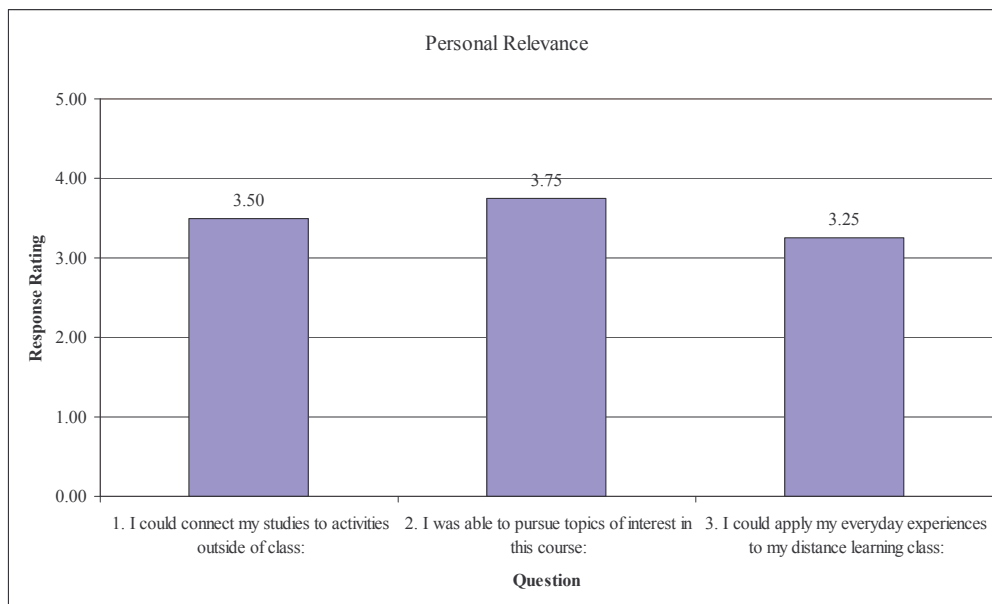
One interviewee explained that distance learners have tried to combat the lack of social interaction in the online environment by taking it upon themselves to introduce themselves to their professor in person. Professors have also taken strides to improve their social interaction with students through several different techniques. One professor of Management has elected to make an introductory video for her distance learners, in which she gives them some background information about herself. The video allows students to get a better feel for their new professor. This professor feels it is important that students have a face to put with the communications taking place throughout the course. Similarly, another professor of Management has chosen to prepare an introductory presentation for her students. With the help of Camtasia Studio, she puts together a power point presentation combined with audio and a picture of herself. In her opinion, that initial connection is often the biggest hurdle to overcome in an online learning environment.

In many cases, the professors I talked to went even further in attempts to address this lack of social presence issue by allowing the students to attend on campus lectures if their students were enrolled in a distance learning class that also has an on-campus section. This allowed students near campus who may feel overwhelmed by their distance learning courses to step back into a learning environment which may be more comfortable for them. The instructors explained that students sometimes need some conventional classroom encouragement while embarking on distance learning. Similarly, these professors allowed students to also come to on-campus office hours. In many cases, this face to face time with a professor is vital in reassuring the student that he or she is meeting the course objectives. This idea of instructors making themselves available both online and in person seems to be very important in addressing the social presence issue of distance learning.

A professor in the System Dynamics program felt that students for the most part had a very positive experience with social interactions through distance learning. His students used the myWPI discussion boards very frequently to aid in social interactions. He believed this allowed the students to connect on a much deeper level than may have been possible in a conventional course setting. This professor had multiple threads setup on the discussion boards containing topics related to course work and other out of class experiences. Given this freedom to post virtually anything on their minds, he felt students could successfully interact with each other. Halfway through the course he is currently teaching, he mentions that there are approximately 500 messages on the board, proving that his students are very socially engaged with himself and one another. This shows that perhaps physical social interaction is not always necessary to create a successful distance learning environment if students and professors actively participate in online discussions.

4.1.2 Cognitive Presence

In terms of cognitive presence, the student surveys showed mixed results. Numerous different facets of cognitive learning were addressed in the student survey, as this is not as easily measured as social or teaching presence. These facets include personal relevance, authentic learning, active learning, and student autonomy. *Figure 4.3* below shows the average student response to questions concerning “Personal Relevance”. When constructing a cognitive presence, it is important for students to explore their own learning strategies and be able to relate their coursework to things outside of the classroom. The average student response to the question “I could connect my studies to activities outside of class” was 3.5. For the question, “I was able to pursue topics of interest in this course”, students responded with a 3.75. This shows that students were able to direct their own learning experiences to some degree which is a vital part of keeping a student engaged in course material. The last question “I could apply my everyday experiences to my distance learning class” received an average student response of 3.25, showing that students sometimes felt they could do this. On average for this group, the students responded between “sometimes” and “often” that their distance learning courses were personally relevant to them.

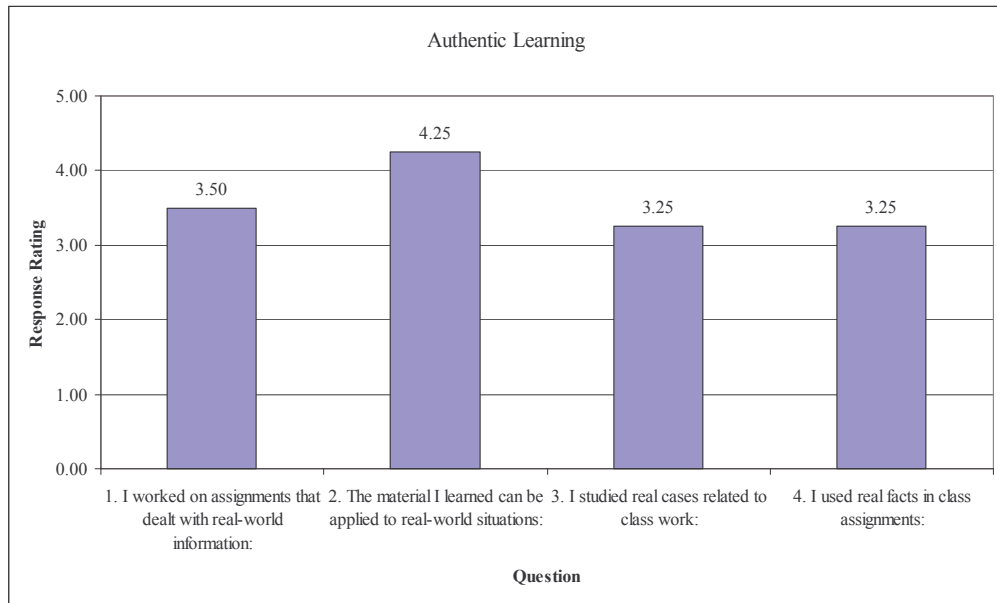


Key for Response Rating:

- 1 – Never
- 2 – Seldom
- 3 – Sometimes
- 4 – Often
- 5 – Always

Figure 4.3: Average Student Response for Personal Relevance

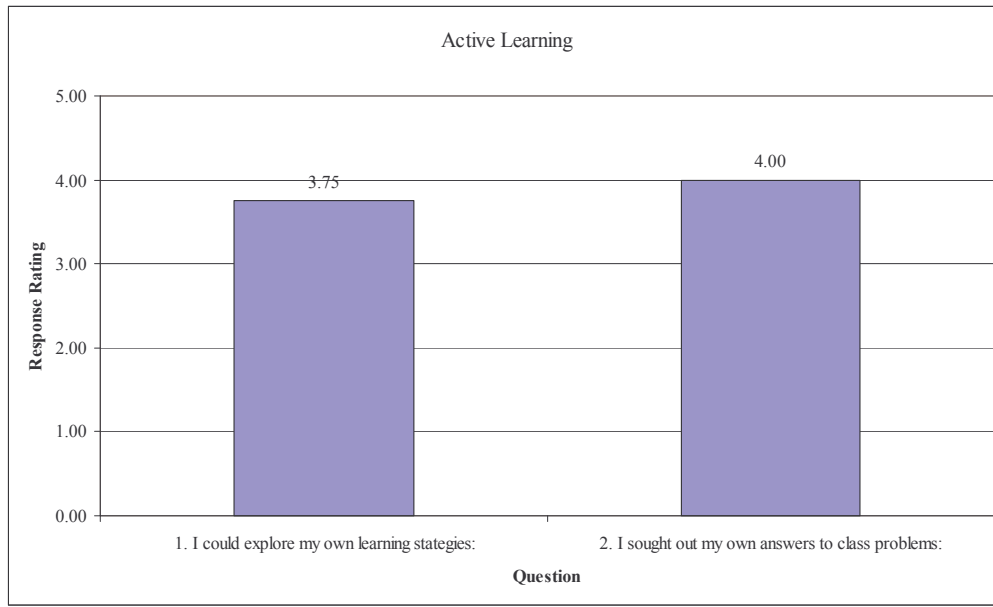
Figure 4.4 below shows the average student response to questions concerning “Authentic Learning”. For the first question, “I worked on assignments that dealt with real-world information”, the average student response was 3.5. Question two, “The material I learned can be applied to real-world situations” had the largest response in this category, 4.25. Having a student apply classroom lessons to problems that exist in the real-world is very important in creating a student’s cognitive presence and students showed that they were still able to do this in distance learning courses. The next question, “I studied real cases related to class work” had an average response of 3.25. The last question “I used real facts in class assignments” had an average student response of 3.25. Similarly to personal relevance, students felt on average their online classes were between “sometimes” and “often” relevant to the real-world.



Key for Response Rating:
 1 – Never
 2 – Seldom
 3 – Sometimes
 4 – Often
 5 – Always

Figure 4.4: Average Student Response for Authentic Learning

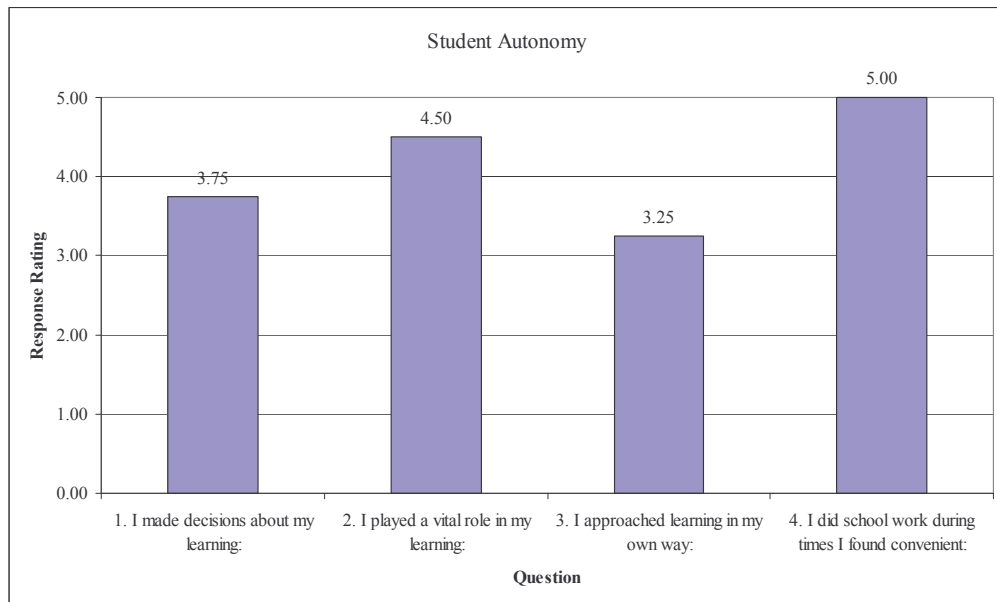
In *Figure 4.5* below, the average student responses in the category of “Active Learning” are shown. For the first question “I could explore my own learning strategies”, the average score was 3.75. The next question, “I sought my own answers to class problems” had an average student response of 4. This shows that distance learning is effective at allowing learners to actively take control of their learning experience. This makes sense because of how independent distance learning programs are.



Key for Response Rating:
1 – Never
2 – Seldom
3 – Sometimes
4 – Often
5 – Always

Figure 4.5: Average Student Response for Active Learning

Student autonomy is another facet of cognitive presence that was looked at in the survey. *Figure 4.6* shows the average student response to questions concerning “Student Autonomy”. For the first question, “I made decisions about my learning”, the average student response was 3.75. For the next question “I played a vital role in my learning” had a higher response of 4.5. In the third question, “I approached learning in my own way” the average student response was of 3.25. The last question “I did school work during times I found convenient” had an average student response of 5. Again, this shows that students are finding distance learning courses to be highly independent and allow them to not only take an active role in their learning but also to approach learning in their own way.



Key for Response Rating:
 1 – Never
 2 – Seldom
 3 – Sometimes
 4 – Often
 5 – Always

Figure 4.6: Average Student Response for Student Autonomy

The professors I spoke to expressed different opinions about the issue of cognitive presence in distance learning. Some professors thought that their students constructed their cognitive presence fairly well despite the restraints of an online learning environment. They found that the asynchronous aspect of distance learning gave students the ability to take more time to construct their ideas in a more thoughtful manner. When compared to a conventional course in which students have to give immediate feedback to teachers and their other students, the students have the ability in an online course to mull over ideas, which may create a deeper cognitive presence.

The professors I interviewed really turned to discussion boards as a tool to give their students the opportunity to construct well thought out ideas and share them with their peers. Many professors believe that students become more knowledgeable through the sustained reflections that take place on discussion boards. Students can take their time when responding to discussion board topics and they can benefit from many different perspectives from their peers on certain course related issues. I found that many professors rely on the discussion boards as the sole means by which their students communicate with other students

Disciplined learning was one issue of cognitive presence which professors expressed concern. In an online learning environment, students must take on much more of the learning responsibility. The instructor no longer has the ability to monitor the students' progress by observing them during scheduled class time. The asynchronous aspect also means that there is not any immediate feedback. These two facts can severely impede a student's ability to successfully construct cognitive ideas. In general professors believed that some students may perform better than others in distance learning. Often times, the students who enroll in these courses are very well disciplined and know exactly what is expected of them. In addition, because all distance learning programs at WPI are graduate programs, students already have a bachelor's degree and a numbers of years in the professional world. Some students' tuitions are paid for by an employer, so they are not only self motivated, but are extra motivated to impress their boss and do well in their distance learning programs to maintain tuition assistance from them.

Translating some classroom experiences into an online learning environment is another learning hurdle for the ADLN faculty. In the Engineering department, much of the curriculum is based upon lab exercises. These learning activities are vital in exposing students to real-world applications of concepts learned in course materials. Although there are simulations out there that could be used to supplement this part of an engineer's education, some professors believe that they simply do not allow students to construct their own cognitive ideas in the same manner. I found a similar issue when interviewing professors who taught courses such as Economics where there are a lot of equations, graphs, and visual concepts. They believe it is important to give students visual and audible feedback when exposing students to these concepts for the first time.

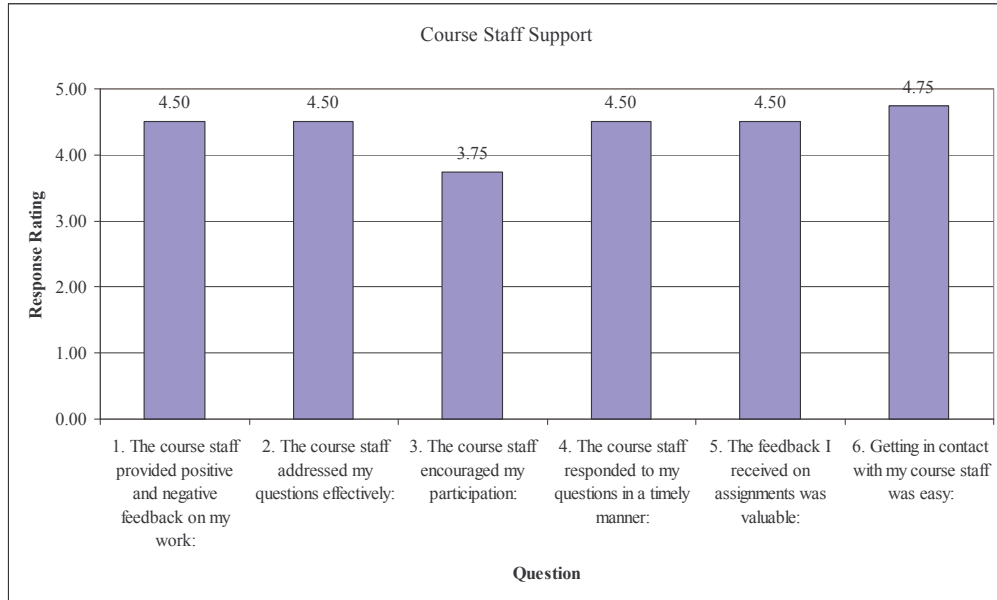
The majority of professors I interviewed expressed the idea that cognitive presence is independent of the learning environment. They feel that the student's ability to construct ideas is based upon how the course material is presented and how the

problems are structured. These professors believed that students would probably do very similar in either learning environment. For example, the learning experience for the student is exactly the same whether they are electronically submitting a homework assignment or giving an instructor a handwritten copy. An important finding here is that even though consensus is not perfect, the majority of teachers felt that cognitive presence is really not an issue in distance learning courses. In addition, the results of the student surveys seem to further this idea as the average responses for cognitive presence questions were higher than for social presence question, indicating the lack of social presence is more of an issue for students. Further research here would really be helpful to determine if there is in fact any difference between the cognitive presence for students in distance learning and regular on-campus courses. Perhaps the same survey could be given to on-campus students taking equivalent courses and the results could be compared.

4.1.3 Teaching Presence

Overall, distance learners were pleased with the course staff support which is an indication of strong teaching presence in distance learning. *Figure 4.7* shows the average student response for questions concerning “Course Staff Support”. For the first question, “The course staff provided positive and negative feedback on my work” students responded with a score of 4.5. This is a very high rating, indicating that students received feedback from staff between “often” and “always”. Similarly, the students responded with a 4.5 on the question “The course staff responded to my questions in a timely manner”. This shows that students received feedback quickly almost always. Question 5, “The feedback I received on assignments was valuable” also had a score of 4.5. These questions show that students were overall pleased with the feedback received from the course staff, both in content and in speed of response. The question “The course staff addressed my questions effectively” showed that students received adequate answers to their questions almost always with a score of 4.5. For the question “The course staff encouraged my participation”, average student response was slightly lower with a score of 3.75 out of 5. This showed that students were not encouraged quite as much to participate which makes sense given the limited participation opportunities in distance learning classes.

Overall, responses to questions concerning course staff support, or teaching presence, were very high, with responses nearly at “always” for most questions. Students on average felt that the staff was helpful and efficient at providing feedback and assistance. This is extremely important for the success of distance learning programs.



Key for Response Rating:
 1 – Never
 2 – Seldom
 3 – Sometimes
 4 – Often
 5 – Always

Figure 4.7: Average Student Response for Course Staff Support

The issue of teaching presence was also discussed with professors. Again opinions varied greatly on this subject. Some professors felt that their teaching presence in an online learning environment was just as effective as when teaching an on-campus course. These professors felt as though they made a definite connection with students on an instructional level. Others felt like they had little or nothing to do with their students learning processes since once all of the course materials were posted, it was solely up to the student to meet the course requirements.

One of the professors I spoke to explained that he actually covers the issue of teaching presence in one of his classes. In order for the students to buy into this concept, he said he must “walk the talk” and abide by the concepts he teaches. Therefore, he strives to give his students good feedback on all class related issues. The means by which he accomplishes this is through the discussion boards on myWPI. Just as how the students can improve their cognitive presence on discussion boards, this asynchronous communication gives teachers the ability to give the students well thought out responses, and enforce their teaching presence.

As mentioned before, professors often give their students a video or presentation containing background information about themselves. These professors feel it is very important that students get off “on the right foot” and feel comfortable with their new

learning environment and new instructor. Therefore, these videos or presentations also outline all course objectives and expectations. One professor releases a video half-way through the semester giving all her distance learners a status update. She feels that this strong instructor feedback definitely makes her teaching presence known to all her students.

However, one professor argues that in an online learning environment the asynchronous aspect, which allows for the improvement of sustained reflections, often makes it difficult for instructors to clear up day-to-day learning issues faced by students. She felt that deadlines and course materials needed to be communicated to students repeatedly to make sure that everyone was on the same page. Another professor explains that if everything was properly laid out in the beginning, students tended to follow these guidelines very well.

Some professors feel that due to time constraints, it would be important to have another faculty member assist them in communicating to distance learners. Teaching assistants could supplement the professor's feedback, thus giving the students more instructor support. One professor has his teaching assistant constantly monitor the discussions boards so that students are given very timely feedback on any course related issues. This is not so much a technological solution to this issue of teaching presence as it is a better use of faculty resources. He mentions that perhaps an automated system for student feedback could be implemented to obtain similar results.

4.2: Looking into Course Development and Student Assessment Issues

In addition to looking at presence issues, the ADLN instructors were interviewed regarding course development and student assessment issues.

4.2.1 Course Development

To develop online courses, it was found that instructors mainly used existing on-campus courses to help them. For the most part, each professor teaches an on-campus section of their online course. Therefore, they have chosen to remain consistent by structuring each section the same way. All ADLN professors I spoke to use myWPI as a means to get their course content onto the web. Using the myWPI's built in tools, such as the file manager and course folders, instructors simply organize all the course content into folders that correspond to the same structure they use with their on-campus section. For example, if they have course content divided up into weeks of the term for an on-campus course, they simply create folders on myWPI corresponding to each week and post the relevant course materials into that folder. One professor I interviewed has chosen to divide her course up into specific topics. For each topic, she makes a folder on myWPI. Within each folder she posts all of her lecture notes, readings from the text, homework assignments, homework solutions, streaming video of lectures, and supplement materials related to the course work. She explains that because she does this with her on-campus students, she has chosen to do the same thing with her distance

learners. This is so they can have the same learning experience and she can grade them all in the same manner.

Some professors do however slightly modify the flow of their online course by restructuring their syllabus. One professor I spoke to uses suggested dates for the completion of certain course tasks. He understands that his online students are often juggling work, school, and a personal life. Thus, he has built in some flexibility into the course, allowing students to stray from the strict deadlines of a normal syllabus.

A professor of Management uses a slightly different method for communicating her course objectives. She has chosen to post new materials on a weekly basis. Every week, she has a specific day that she posts all of the week's assigned readings and homework. She explains that this has two purposes; her students do not become overloaded by information, and they know exactly what is expected of them each week.

4.2.2 Student Assessment

Typically professors' stance on assessing distance learners was similar to that of the methodologies they use to construct and run their distance learning courses. For the most part, the professors assessed students' academic performance in distance learning much the same way they do for on campus students. As with any course, they felt assessment was strongly tied to course materials and the outlined course objectives given by the instructor. They felt it really does not matter how the course materials are distributed to students, what matters is the content they provide. It is up to the professor to supply students with course materials and objectives that drive students to meet the desired educational outcome of the course.

One of the questions asked in the interviews was whether or not ADLN professors felt the following categories were sufficient in assessing a student's academic performance in an online learning environment: critical thinking, problem solving, demonstrating techniques, self-management, information access/management, demonstrating knowledge, designing/creating, communicating, and teamwork. These categories were derived following Kerka and Wonacott (2000). The professors' answers varied on these criteria.

A professor of Management felt that the category of information access / management was not a very good measure of a student's academic performance. He felt that a system that keeps track of how often and long students are logged into their course websites is problematic similar to the way taking attendance is for an on-campus course. The students may be physically present, but there is no way to accurately determine whether the student is truly engaged in the course material. Many of the professors I interviewed felt that in an online learning environment, critical thinking was a vital part of assessing students. With any type of learning, it is important for students to step back and thoroughly understand the material they are learning. It is then up to the professor to force students to apply their newly gained knowledge to an assignment.

Some of the professors I interviewed believed that teamwork was a very important part of learning regardless of setting. One professor found that his students performed much better on group projects than on projects that were done alone. This is because he found that when students shared their ideas on an individual basis they became much more engaged in the course material. Another professor disagreed with this viewpoint. She felt that teamwork should not be considered at all in assessing distance learners. Many of her students are busy professionals that have demanding jobs as well as families to take care of. She felt that it was too much of a hassle for students to constantly be in communication with other students in trying to complete a group assignment.

Communicating was another issue of student assessment that professors were divided on. One professor felt that in a graduate level course, communications skills should not be a part of student assessment. In her opinion, students should have already developed these skills at an undergraduate level and through professional experience. On the other hand, one professor argued that communication throughout distance learning is a vital part of creating a successful learning experience. In fact, this professor assesses students responses on the discussion boards based upon frequency and content.

Just about every professor agreed that assessing students' academic performance in an online learning environment was not any more of an issue than on-campus assessment. Because of the many number of ways in which student's can submit their assignments, via fax, email, myWPI's digital drop box, and even conventional mail, distance does not impede an instructor's ability to assess students at all. Many professors choose to use homework assignments and take-home tests, all of which can be submitted in a variety of different ways. They feel that to be consistent and fair, they must grade distance learners identical to the on-campus students and thus do so.

4.3: Investigating Emerging Technologies

Here at WPI, the ATC staff has found that most of the ADLN instructors have chosen to use myWPI to run their distance learning course and this is consistent with the instructors interviews. All of the tools offered through myWPI seem to offer professors enough freedom with their course content to create their own unique learning experience. However, the ATC is very flexible in allowing faculty to use other course management tools if needed. One member of the ATC explains that some Computer Science professors have chosen to go with another content distribution system called SourceForge. Currently myWPI does not support the variety of different computer languages possible on SourceForge. She explains that this website allows professors to more easily distribute software programs through open source code and has more powerful project management tools.

One of the main jobs of the ATC is to support faculty with their technological needs. Professors work with the ATC to record lectures in a variety of different formats. The ATC supports professors in the use of digital audio recording devices to record their lectures so that they can later be posted online. The ATC also has a television studio which has the capabilities of recording digital video as well as digital audio. Sometimes, professors will use this studio to actually stream their lectures live to students all across the country. The ATC also works with many professors to make course content available on reserve at the library.

Another part of the ATC's commitment to improving distance education is to ensure that students are confident in using technologies in place for distance learning courses. The ATC works with the help desk to address student concerns regarding technological issues. One staff member explains that frequently distance learners have not had any formal education in quite some time. These students may not be familiar with distance learning, so it is up to the ATC and help desk to get them up to speed and comfortable with this new approach to education. One example of this is recently the ATC has found many students have an issue with the various online accounts they have. Therefore, they have tried to shrink the number of user accounts and passwords by making many accounts, such as myWPI and Webmail, use the same username and password.

In recent years, the ATC has also implemented WPI's computer terminal service. This application allows distance learners to download and install most of the software available in on-campus computer labs. This is a good example of how technology is being used to simulate a conventional learning environment.

ADLN instructors are in constantly trying to work with the ATC about how to translate lab experiments and other physical simulations into a distance learning environment. One ATC staff member explains that it is very difficult to get the lab component of an engineering education incorporated into distance learning. One professor in the Civil Engineering department has started to use Flash Animation to simulate real world scenarios. In one experiment, wind speed and other variables are

controlled by the user to investigate the effect certain parameters have on pollution. Another professor has started to experiment with a virtual lab. This lab can be remotely controlled by distance learners so that they can carry out experiments much like they would in a real lab.

The ATC has helped many faculty members improve their online lecturing with the implementation of Camtasia Studio. This program allows teachers to screen capture video straight from their computer as well as add their own audio to the background. An ATC staff member explains that when Camtasia Studio is used in conjunction with a Tablet PC, professors can use a stylus to mark up their PowerPoint lectures or any other computer documents. This real-time ability to modify lecture notes is very similar to professors writing on a blackboard in a conventional classroom setting.

Interwise video conferencing is another tool the ATC has found very useful in distance learning. This software allows simple and easy video conferencing between multiple participants. One staff member explains that in the Fire Protection Department, one professor uses this technology to have a guest speaker sit in on his class. In this case, it was very impractical for the speaker to travel cross-country for a one hour lecture each week. Instead, he can sit in the comfort of his own office and perform the same exact task from hundreds of miles away. This is a perfect example of how geographic barriers can disappear through the use of technology.

One ATC interviewee presented an excellent example of how this technology has been used to improve distance learning. One professor uses Interwise to web-conference his lectures to distance learning students. The students can, to some extent, participate in the on-campus lectures much like students sitting in the lecture hall. He also offers students virtual office hours that he holds through Interwise. Through these synchronous communications, he feels students are getting a better educational experience.

Most of the technologies used in distance learning are also used in hybrid-learning. One member of the ATC has also found that once professors are exposed to new technologies through teaching a distance learning class, they later implement these into their on-campus courses. They find that new technologies can often enhance students learning experience and make their teaching more efficient.

The ATC is always looking into new technologies to improve distance learning. Currently they support the use of wikis, blogs, and flickrs by staff and students. On the horizon they may be implementing a new tool introduced by Blackboard which allows students the access to blog and wiki building tools through myWPI. I also learned that a social book-marking tool called “Scholar by Blackboard” may find its way into myWPI in the upcoming year as well. This myWPI add-in allows users to store their bookmarks online and share them with other people. Learners would have the capability of sharing research interests and other information rather seamlessly. More information can be found at www.scholar.com.

Virtual worlds, such as Second Life may have educational use in the near future. One ATC staff member explains that these simulations of real world environments may create a totally new kind of learning experience. Right now though, she cannot see any real uses for this type of educational tool here at WPI. There is also an educational game called Virtual Leader in which users interact in a virtual world to develop leadership skills. Their website (SimuLearn.net) offers colleges, universities, and companies the ability to set up a virtual online course. The company explains that their software changes and improves key leadership behaviors, eliminates the need for classrooms and travel, builds confidence and enables managers to lead teams with greater productivity. The ATC interviewee explained that this software may be good for students who do not have any real-world job experience, as a way to encourage them to learn about body language, office politics, and how to communicate well within the work place.

Currently, the digital audio and video on myWPI is limited to Windows Media format. However, the ATC is working on getting podcasts into myWPI. This is because they have received a number of requests from students to switch to this new convenient format. One member of the ATC explains that regular podcasting is merely just another means of distributing audio files, and thus is not that much of an improvement on current technology already being used. Because iPod's are very popular among students at WPI however, the ATC may want to implement this new audio and video technology to offer learners some new benefits. Distance learners would be able to put the audio and video files onto their iPods or video-iPods and take course material with them anywhere.

The ATC is strongly considering this technology as noted by the recent acceptance of WPI into iTunes University. iTunes University is a free web hosting service for colleges and universities which provides easy access to a variety of different educational content. Lectures, interviews or any other type of audio content can be accessed 24 hours a day, 7 days a week. Apple boasts that because it is based on the same technology as the iTunes store, it is just as versatile as the music files millions purchase on iTunes annually (Apple.com). Some of the ATC staff however thinks that WPI may not want to go that route due to security issues. As mentioned earlier, the ATC is working on implementing new tools into myWPI which will allow teachers to podcast audio files. They have indicated that these new tools should be available to the entire WPI faculty in A-term 2007.

5 Conclusions and Recommendations

Through the analysis of my data, I have brought together information regarding current issues in distance learning as expressed by students, instructors and staff at WPI. All of the information obtained in the previous section is used to support the conclusion that new technologies can improve web-based distance learning courses by addressing these issues.

Overall, I found the biggest obstacle to improvements in the areas of social, cognitive, and teaching presence is time constraints. Professors just do not have the time to make a substantial effort to socially interact with their distance learning students. This is of particular concern because there was a general consensus among both students and instructors that a lack of social interaction between the professor and students was the greatest obstacle in distance learning. Thus any new technologies that aim at improving upcoming distance learning courses should focus on improving the social presence of students while taking into consideration the time constraints of a professor. Ideally, technologies could improve overall course satisfaction and decrease the time and effort required to run them.

Even if such technologies are implemented to improve distance learning, there are still many hurdles to overcome that worry some instructors and staff. Some believe that distance learning has to be rethought completely from the ground up in order to be improved, and thus new technologies that try to make distance learning courses increasingly similar to on-campus instruction might not be the most effective way of improvement. Rather than simply trying to convert an on-campus course directly to a distance learning analog, we may have to totally rethink the way in which the course is offered. I can conclude from my interviews that most ADLN professors view distance learning as simply a different medium to conduct the same conventional learning practices. This is why current online student assessment and course methodologies are mostly based upon their on-campus counterparts. However, most of the distance learning issues experienced by student and professor are not so much technological issues as they are fundamental differences between conventional and distance learning. Therefore before substantial improvements can be made in distance learning we may have create a whole new model for distance learning that resolves the issues created by these differences.

However there is still significant demand for new technologies from instructors and students that suggest that if implemented these new methods could greatly improve the courses for both parties. Some of the new technologies that could be implemented are Second Life, Virtual Leader, Blackboard's Scholar, podcasting, and video podcasting. I believe that because the ATC has seen so many student requests for podcasting and video podcasting, this technology should be implemented into distance learning courses at WPI. The benefits of these two technologies however are not likely to be the same. Podcasting is just an alternative method of distributing digital audio files to students. Given that digital audio technology is already being used in many distance learning courses, the staff at the ATC as well as myself would agree that implementing this technology would not

greatly revise the current distance learning structure. While podcasting might increase the number of ways a student can listen to these files and be more convenient for them, podcasting is not likely to have that much of an impact on improving distance learning. In addition, a great deal of the ADLN faculty does not see stand-alone audio as being a much of a learning tool in an engineering based education.

Video podcasting on the other hand, offers students the freedom to view video course content anywhere, any time. Many students on campus may already have a video-iPod, so this would be an easy switch from the Windows Media Video format currently in place. Any computer savvy student can easily put videos onto their iPod using iTunes so this would require very little additional effort for students to learn this new software. Directions on adding video files onto a video-iPod can be found in Appendix A. The video files would still be viewable on PC's, so there would not be any loss of functionality, only improved functionality. Many students carry their v-pod's with them wherever they go, and thus students would have access to course material potentially anywhere and do not have to be connected to a computer to access the videos, allowing them to view material in their free time. Another benefit of this technology is that older digital videos in other formats could easily be converted by professors to the required MPEG-4 format with the use of conversion software such as Ahead's "Nero Burning Rom". Because the ground work for this technology has already been laid, teachers will find this new technology easy to use and implement. There are instructions in Appendix B on converting virtually any kind of digital video, including DVD's, to the video-iPod compatible video format.

Additionally, this technology will likely improve social presence for distance learning students. With the aid of a web cam, students can share v-pod files with one another so they are able to see the classmates they are communicating with during an online course, and feel more connected with them. Teaching presence would also be improved through the use of v-pod lectures as an alternative means of course instruction. Students would be able to see their professor as they are being instructed, which has been shown to be very beneficial in any kind of learning. This technology would be suited for courses that demand visual as well as audio content, enhancing the students overall understanding of course material or increasing their cognitive presence. Because video-podcasting would improve the convenience of viewing course material for busy students and would also address and improve many of the issues relating to presence in web-based classroom, I would recommend that video-podcasting be added to distance learning courses.

While the use of video podcasting appears to be a way to improve distance learning programs, the only way to know for sure is to test this hypothesis. This summer, this new technology will be implemented into two WPI distance learning courses. The effectiveness of video-podcasting should be assessed by students, the instructor and course staff. If students find video-podcasting to be beneficial to their learning process and the instructors find video-podcasting to be easily implemented and used, the use of podcasting should be promoted throughout all WPI distance learning programs. Until a better model of learning can be developed that completely improves the distance learning process, the addition of new technologies can only help students to have a more fulfilling

learning experience. As we get closer and closer to being able to simulate an in-classroom experiences without any of the constraints of physically having to be present, distance learning will continue to be improved.

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Appendices

Appendix A: Instructions on Adding Video Files to a Video-iPod

1. Once the video has been downloaded to the directory of your choice, run the program “iTunes”, Apples recommended software for managing media files located on an iPod (available at www.apple.com/itunes/).
2. Next, connect your iPod to the computer with the supplied USB cable and wait for a tab with your iPod on it to become visible on the left menu within the iTunes program.
3. Go to “File” > “Add Files to Library”. Then browse to the directory in which the video is located and click “Open”.
4. The file has now been added to the “Movies” tab. Now, select “Edit” > “Preferences” > “iPod” > “Video’s” > “Automatically update all videos”. Click “OK”, and wait for the iPod to finish updating. The video should now be on your iPod, locate it from the iPod’s main menu by going to “Videos” > “Movies. That’s it!

Appendix B: Directions on how to Convert Digital Video to iPod Compatible Video

1. Using Ahead's "Nero Burning Rom" software open up Nero "StartSmart" by double clicking the shortcut icon which should be found on your desktop after the program has been installed. Software can be purchased from www.nero.com for between \$79.99 and \$99.00.
2. From the "Applications" list found on the left side of the SmartStart menu, click on "Nero Recode".
3. A new window now pops up entitled "Nero Recode". Select "Recode DVD's and Video's to Nero Digital.
4. You should now be on the "Nero Digital Titles" tab. Click on the "Profile Category" drop down menu and select "Apple iPod". Make sure that on the "Profile" drop down menu, iPod Video is also selected.
5. Now you are ready to add videos you wish to convert. Simply click the "Import Files" button found on the right, and browse to the video files or DVD tracks.
6. Once you have selected the file or files, click the "Add Title" button so that they are added to your content list in the main window.
7. If you wish to adjust the video quality so that the file can fit onto convenient media, click on the drop down menu entitled "Fit to Target" and select the appropriate file size or designate your own file size by selecting "Custom..." .
8. Click next, then click the "Browse" button to designate a folder you wish to create the files in. If you have your iPod connected, the program will already have it selected, and will copy all the files to your iPod automatically.
9. Click the "Burn" button, and wait for the files to be converted. You have now finished converting digital video into an iPod compatible format!

Appendix C: How to Edit a Wiki

1. To edit a wiki page on the site Wikipedia (www.wikipedia.org/), simply click “edit this page” from the top of your web browser.
2. This brings you to the editing page with an active textbox filled with the current information being displayed on the article’s web page. Within that textbox, you can edit the information at your will.
3. You can now preview the page with your newly edited information by clicking on the “Show Preview” button below the textbox.
4. Once you are satisfied with the changes you have made, select the “Save page” button located below the textbox. Now you have completed editing a wiki!

Appendix D: How to Create a New Wiki Article

1. One of the most popular wiki sites is Wikipedia (www.wikipedia.org/). To create a new wiki article on Wikipedia, you must first enter the name of an article into the wiki search engine that does not exist within the website's database.
2. Once this has been completed, click on either the link in red or the link with a question mark.
3. This brings you to a page with an active textbox in which you are to add the information you intend to post about this newly formed topic. Using the correct syntax, add all the information you feel will be useful to the article and select the "Save page" button located below the textbox. You have now finished posting an all new wiki!.

http://en.wikipedia.org/wiki/Wikipedia:Tip_of_the_day/September_14%2C_2006

Appendix E: Student Survey

WPI Distance Learning Survey

Instructions

Please honestly fill out this simple questionnaire pertaining to the experience you had with distance learning at WPI. In the “General Information” section, please fill in some background information about yourself. In the survey section, please fill in your answer on the line. Use the following numbering scheme when filling in your answers to the questions:

- 1 – Never
- 2 – Seldom
- 3 – Sometimes
- 4 – Often
- 5 – Always

General Information

1. Name: _____
2. Gender: _____
3. Course: _____
4. Semester and Year Course was Taken: _____

Survey Questions

Course Staff Support:

1. The course staff provided positive and negative feedback on my work:

2. The course staff addressed my questions effectively: _____
3. The course staff encouraged my participation: _____
4. The course staff responded to my questions in a timely manner: _____
5. The feedback I received on assignments was valuable: _____

6. Getting in contact with my course staff was easy: _____

Student Interaction and Collaboration:

1. Group work was a part of my distance learning assignments: _____

2. I related my work to other's work: _____

3. I worked with others on class assignments: _____

4. I interacted with other students throughout the course: _____

5. I discussed my ideas with other students: _____

6. I collaborated with other students in the class: _____

Personal Relevance:

1. I could connect my studies to activities outside of class: _____

2. I was able to pursue topics of interest in this course: _____

3. I could apply my everyday experiences to my distance learning class: _____

Authentic Learning:

1. I worked on assignments that dealt with real-world information: _____

2. The material I learned can be applied to real-world situations: _____

3. I studied real cases related to class work: _____

4. I use real facts in class assignments: _____

Active Learning:

1. I could explore my own learning strategies: _____

2. I sought out my own answers to class problems: _____

Student Autonomy

1. I made decisions about my learning: _____

2. I played a vital role in my learning: _____

3. I approached learning in my own way: _____
4. I did school work during times I found convenient: _____

Student Satisfaction:

1. I prefer distance learning: _____
2. Distance learning was an exciting experience: _____
3. Distance learning was worth my time: _____
4. I enjoyed this distance learning course: _____
5. I would prefer it if all of my education had taken place through distance learning: _____

Appendix F: ADLN Interview

Interview Preparation:

1. Choose a setting with little distraction:
 - a. Preferably in their place of work on the WPI campus.
2. Purpose of Interview:
 - a. Gather faculty feedback on the overall quality of distance learning at WPI, determine some of the things that are missing from the online learning experience, and discover current technologies they are using to teach their classes.
3. Format of Interview: Standardized Open-Ended Interview
4. Determine how long the Interview will take:
 - a. Interview should take no longer than half an hour to forty-five minutes.
5. Indicate how to get in touch after the interview:
 - a. Email Address: ageorge@wpi.edu
6. Ask the interviewee if they have any questions before the interview gets under way.
7. Ask for permission to tape record the interview for the use of further analysis of the information gathered.

Type of Interview:

1. The Standardized, open-ended interviewing approach will be used
 - a. In this format the same open-ended questions will be asked to all of the interviewees. This will facilitate quicker interviews as well as gather data that can easily be analyzed and compared.

Conducting the Interview:

1. Verify that the audio recording source is working properly.
2. Ask one question at a time; allowing for sufficient response time.
3. Remain as neutral as possible.
4. Practice caution while taking notes to not offend or affect the interviewee's response.
5. Provide transition between topics.
6. Keep control of the interview by not allowing the interviewee to stray onto another topic, take too long answering a question, or begin asking the interviewer questions.

Interviewing Questions:

1. Background Information:
 - a. What degrees do you have, and what areas are they in?
 - b. Are you willing to tell me what age group you are in? (20-30, 30-40, etc.)
 - c. Could you please tell me what online classes you have taught and are currently teaching?
 - d. Are there any unique past educational experiences you have had within the field of educational technologies that you would like to share?
 - e. Have you had any past educational experiences within the field of distance learning that you would like to discuss?
 - f. Are there any past professional experiences you can think of within the field of educational technologies?
 - g. Are there any unique professional experiences you have had with distance learning that you would care to discuss?

2. Behaviors:
 - a. Is there anything that you are currently working on that is related to the field distance learning?
 - b. Is there anything that you are currently working on that is related to the field of educational technologies?
 - c. In your professional career, has there been anything you've done that has been focused on improving the distance learning process?
 - i. Any specific technologies that come to mind?

3. Knowledge Based Questions:
 - a. Could you please tell me about some of the technologies you use here at WPI to teach your distance learning courses?
 - b. Have you had the chance to use any of these technologies in hybrid-learning classes? (classes taught through a mix of conventional and web-based learning)
 - c. Are there any specific technologies that come to mind that assist in student to student, and student to teacher interactions?
 - i. Are these asynchronous or synchronous?

4. Feeling / Opinion Based Questions:
 - a. Researchers have spent much time trying to identify advantages and disadvantages of distance learning courses. One important concept I have found in my research is the idea of social presence or "the ability of learners to project themselves socially and emotionally in a community of inquiry".
 - i. As an instructor of a distance learning course, how effective is your ability to socially interact and project yourself socially onto the students?
 - ii. How effective do you feel your student's ability is to interact socially in an online course?

- iii. Do you see any areas of this social presence issue which need to be addressed?
 - iv. Are there any technologies you can think of that could possibly improve address some of these issues?
- b. Another kind of presence I have found to be important in distance learning is cognitive presence. Defined as “the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry”.
 - i. How well would you describe your student’s ability construct their own cognitive presence within the virtual classroom?
 - ii. Do you see any areas of this cognitive presence issue which need to be addressed?
 - iii. Are there any technologies that you think could possibly improve this area of distance learning?
- c. The last kind of presence I came across in my research was teaching presence. Defined as the ability of a person to project themselves as an instructor, establish the course content, and accommodate student needs.
 - i. How would you describe your ability to exert your own teaching presence while instructing a distance learning class?
 - ii. Do you see any areas in which your own teaching presence could be improved?
 - iii. Are there any technologies that you think could possibly improve this area of distance learning?
- d. There are many different questions that arise as to what criteria should be incorporated into the evaluation process of distance learning courses. I found in my research that for the most part online assessment can be broken down into the following categories: critical thinking, problem solving, demonstrating techniques, self-management, information access/management, demonstrating knowledge, designing / creating, communicating, and teamwork.
 - i. How effective do you feel those current methods are in rating a student’s academic performance?
 - ii. Can you think of any other methods of student assessment I have not listed that could also be used to improve the distance learning process?
 - iii. Are there any technologies that you think could possibly improve this area of distance learning?
- e. I have found in my research that the methodology chosen in developing, and used throughout an online course, is an integral part of creating a successful distance learning experience.
 - i. Could you please describe for me any formats, templates, or methodologies you have used to create and maintain your online course?

- ii. Are there any technologies that you think could possibly improve this area of the distance learning process?

After the Interview

1. Verify that the tape recorder worked throughout the interview.
2. Finish up note taking.
3. Write down any observations made during the course of the interview.

Appendix G: ATC Interview

Interview Preparation:

8. Choose a setting with little distraction:
 - a. Preferably in their place of work on the WPI campus.
9. Purpose of Interview:
 - a. Gather information on current educational technologies in use at WPI and candidate technologies for future implementation.
10. Format of Interview: Standardized Open-Ended Interview
11. Determine how long the Interview will take:
 - a. Interview should take no longer than half an hour
12. Indicate how to get in touch after the interview:
 - a. Email Address: ageorge@wpi.edu
13. Ask if they have any questions before the interview gets under way
14. Ask for permission to tape record the interview for the use of further analysis of the information gathered

Type of Interview:

2. The Standardized, open-ended interviewing approach will be used
 - a. In this format the same open-ended questions will be asked to all of the interviewees. This will facilitate quicker interviews as well as gather data that can easily be analyzed and compared.

Conducting the Interview:

7. Verify that the audio recording source is working properly.
8. Ask one question at a time; allowing for sufficient response time.
9. Remain as neutral as possible.
10. Practice caution while taking notes to not offend or affect the interviewee.
11. Provide transition between topics.
12. Keep control of the interview by not allowing the interviewee to stray onto another topic, take too long answering a question, or begin asking the interviewer questions.

Interviewing Questions:

5. Background Information:
 - a. What is your job title?
 - b. Could you please describe what your job entails?
 - c. Are you willing to tell me what age group you are in? (20-30, 30-40, etc.)
 - d. What degrees do you have, and what areas are they in?
 - e. Are there any past experiences you have had within the field of educational technologies that you would like to share?
 - f. Have you had any past experiences within the field of distance learning that you would like to discuss?

6. Behaviors:
 - a. Is there anything that you are currently working on that is related to the field distance learning?
 - b. Is there anything that you are currently working on that is related to the field of educational technologies?
 - c. In your professional career, has there been anything you've done that has been focused on improving the distance learning process?
 - i. Any specific technologies that come to mind?

7. Knowledge Based Questions:
 - a. What are some of the technologies you know of that are currently in place at WPI to assist instructors in administering their distance learning courses?
 - b. Do you know if these technologies are also used in WPI's blended-learning classes? (classes taught through a mix of conventional and web-based learning)
 - c. Can you think of any technologies currently used at WPI assist in student to student, and student to teacher interactions?
 - i. Are these asynchronous or synchronous?

8. Feeling / Opinion Based Questions:
 - a. Colleges and Universities around the country have chosen to adopt certain technologies not used at WPI i.e.: wikis, blogs, flickrs, video-conferencing, podcasting, etc.
 - b. Explain to the interviewee what these technologies are and give them any relevant background information.
 - i. Are there any other technologies you can think of that that I have not listed and could possibly aid in the distance learning process?
 - ii. What is your opinion on _____ being used as an educational tool in college courses?
 - iii. If this person agrees that the technology in question is indeed useful in education:
 1. Do you feel this technology should be brought to WPI and implemented into some of its distance learning courses?

2. In your opinion, is the implementation of the technology in question at WPI actually feasible?
3. In what ways do you think this new technology will improve distance learning at WPI?
4. If this technology replaces a technology already in place:
 - a. In comparison to a technology already being used, how much more do you feel this technology will improve the distance learning process?
- iv. If this person disagrees with the use of a certain technology and feels that it is not useful in facilitating distance learning:
 1. Why do you think the technology in question is not useful or impractical to be implemented at WPI?

After the Interview

2. Verify that the tape recorder worked throughout the interview.
3. Finish up note taking.
4. Write down any observations made during the course of the interview.

Appendix H: Student Survey Data

Note: the following numbering scheme was used when filling in the answers to the questions

- 1 – Never
- 2 – Seldom
- 3 – Sometimes
- 4 – Often
- 5 – Always

| | Student 1 | Student 2 | Student 3 | Student 4 | Average |
|--|-----------|-----------|-----------|-----------|---------|
| Course Staff Support | | | | | |
| 1. The course staff provided positive and negative feedback on my work: | 4 | 5 | 5 | 4 | 4.50 |
| 2. The course staff addressed my questions effectively: | 4 | 5 | 5 | 4 | 4.50 |
| 3. The course staff encouraged my participation: | 4 | 5 | 3 | 3 | 3.75 |
| 4. The course staff responded to my questions in a timely manner: | 4 | 4 | 5 | 5 | 4.50 |
| 5. The feedback I received on assignments was valuable: | 4 | 4 | 5 | 5 | 4.50 |
| 6. Getting in contact with my course staff was easy: | 5 | 5 | 4 | 5 | 4.75 |
| Student Interaction and Collaboration | | | | | |
| 1. Group work was a part of my distance learning assignments: | 3 | 1 | 2 | 2 | 2.00 |
| 2. I related my work to other's work: | 3 | 1 | 3 | 2 | 2.25 |
| 3. I interacted with others on class assignments: | 2 | 1 | 1 | 2 | 1.50 |
| 4. I interacted with other students throughout the course: | 4 | 3 | 3 | 3 | 3.25 |
| 5. I discussed my ideas with other students: | 4 | 2 | 4 | 2 | 3.00 |
| 6. I collaborated with other students in class: | 2 | 2 | 3 | 3 | 2.50 |
| Personal Relevance | | | | | |
| 1. I could connect my studies to activities outside of class: | 4 | 4 | 3 | 3 | 3.50 |
| 2. I was able to pursue topics of interest in this course: | 3 | 4 | 4 | 4 | 3.75 |
| 3. I could apply my everyday experiences to my distance learning class: | 3 | 3 | 3 | 4 | 3.25 |
| Authentic Learning | | | | | |
| 1. I worked on assignments that dealt with real-world information: | 3 | 2 | 5 | 4 | 3.50 |
| 2. The material I learned can be applied to real-world situations: | 3 | 4 | 5 | 5 | 4.25 |
| 3. I studied real cases related to class work: | 3 | 4 | 3 | 3 | 3.25 |
| 4. I used real facts in class assignments: | 3 | 3 | 4 | 3 | 3.25 |
| Active Learning | | | | | |
| 1. I could explore my own learning strategies: | 4 | 4 | 3 | 4 | 3.75 |
| 2. I sought out my own answers to class problems: | 3 | 5 | 4 | 4 | 4.00 |
| Student Autonomy | | | | | |
| 1. I made decisions about my learning: | 4 | 4 | 3 | 4 | 3.75 |
| 2. I played a vital role in my learning: | 4 | 5 | 5 | 4 | 4.50 |
| 3. I approached learning in my own way: | 4 | 3 | 3 | 3 | 3.25 |
| 4. I did school work during times I found convenient: | 5 | 5 | 5 | 5 | 5.00 |
| Student Satisfaction | | | | | |
| 1. I prefer distance learning: | 3 | 2 | 4 | 4 | 3.25 |
| 2. Distance learning was an exciting experience: | 3 | 3 | 4 | 4 | 3.50 |
| 3. Distance learning was worth my time: | 4 | 5 | 5 | 5 | 4.75 |
| 4. I enjoyed this distance learning course: | 4 | 5 | 5 | 4 | 4.50 |
| 5. I would prefer it if all of my education had taken place through distance learning: | 2 | 2 | 3 | 3 | 2.50 |