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Effective online lectures: improving practice through design and pedagogy

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EFFECTIVE ONLINE LECTURES: IMPROVING PRACTICE THROUGH DESIGN AND PEDAGOGY

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by

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DOCTOR OF EDUCATION

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VITA

Terry L. Bese

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MAT-956	2010-2015	AIMS Essential Math: The Pythagorean Relationship
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MAT-958	2011-2015	AIMS Essential Math: Area and Perimeter of Rectangles
MAT-959	2011-2015	AIMS Essential Math: Effects of Changing Lengths
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MAT-961	2012-2015	Teaching Algebra: Solving Equations by Working Backwards
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Title of presentation was "Successful Web 2.0 Initiatives With Students and Teachers"
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Title of presentation was "Collaborative Online Tools for Teachers and Students"

ABSTRACT

The purpose of this research project was to improve the practice of using online lectures at a small private university. Using action research methodology, the researcher worked with a group of five university instructors to refine the use of online lectures through design and pedagogical practice. Beginning with a template or guide based on the literature, the instructors developed online lectures connected with a student activity. Following the principles of the TPACK framework, instructors were urged to develop student activities that worked best for their specific content as well as their desired student outcomes. Two cycles of implementation, analysis, and modification were used to refine the template and the student activities.

Data were gathered from the students who viewed the online lectures and from the faculty through focus group meetings after each cycle. Analysis of both the students' experience and the instructors' experience led to minor changes in the template but more significant changes to the associated student activities.

Findings suggest that the effective use of online lectures depends largely on the student activity included with the lecture; in other words, pedagogy is at least as important as design. Other factors, such as practice and experience with developing online lectures are needed to develop the instructors' expertise with both technical issues as well as pedagogical issues. Although the online lecture template and suggested activities list were honed to a degree of effectiveness, it will take an ongoing process of analysis and modification to keep this tool relevant in the coming years.

Chapter 1: Introduction

> Online education is established, growing, and here to stay. It is creating new opportunities, for students and also for faculty, regulators of education, and the educational institutions themselves. Much of what is being learned by the practitioners will flow into the large number of blended courses that will be developed and delivered on most campuses. Some of what is being learned will certainly improve pedagogical approaches and possibly affect other important problems, such as the lengthening time to completion of a degree. Online education is already providing better access to education for many, and many more will benefit from this increased access in the coming years. (Mayadas, Bourne, & Bacsich, 2009, "Abstract")

The trend in education to jump on the Internet bandwagon has many instructors leaping before looking. As the Instructional Design Specialist for a small university's Center for Online Learning, I see it every day; instructors will approach me and say that they "need" to put a lecture online. This "need" to put lectures online, video clips, narrated screen captures, or even recorded class sessions, is now a multi-million dollar industry. On the list of major sponsors for nearly every educational conference you will see the names MediaSite, Tegrity, Echo360, or Panopto. These companies charge a steep price to help put that lecture online (McClure, 2008). But more than dollars and cents, are we paying a price in educational effectiveness as well? Do we, as educators, believe that we can just "can" a lecture and our students will learn? This assumption goes against most modern epistemologies and theories of knowledge and the mind, even if the content of the lecture was superb (Bereiter, 2002b).

Any Instructional Design Specialist will tell you that his or her dream would be for the instructors to come to them and say, "I really want to provide a better learning experience for my students. Are there some technology tools that can help improve what I

am doing?" or "Here is a list of my learning outcomes and course activities. How can I put together a power teaching and learning experience for my students?" According to most of the widely accepted ideas about learning, a social component is very instrumental in assisting in the learning process, possibly because it forces the learner to a level of engagement with the content or concept, so designing positive learning experiences using online content for a learner who is usually alone has its challenges.

The art and science of teaching is called pedagogy (or andragogy **). Art AND science. If you ever had the experience of taking a course, and from the time that you walked into the door until the instructor gave the homework assignment felt like a blink of the eye, then you know what the art of teaching is: pure engagement. Or if you have had the experience of "acing" the final exam – knowing that you learned everything that you were supposed to learn – most likely your instructor was a master of the science of teaching. (**note: technically pedagogy is the term for teaching children and andragogy for teaching adults. However, in many educational settings "pedagogy" is used inclusively for both and will be used throughout the remainder of this paper).

As new technologies are brought into mainstream society, they are adopted into the pedagogy of progressive teachers, and over time their place in the educational process is set. Take for example the pencil replacing the quill pen, mistakes could now be erased; it was like an educational "mulligan". Or the video projector, replacing the overhead, now presentation of content is not limited to some words on a clear transparency but all content that can be on a computer in any form.

Today, new technologies are being tried and tested, finding their place in the modern educational process, but what does good pedagogy look like today in light of these

new tools? Through a thorough review of the literature, this study examined widely used "best practices" in the light of established learning theory and through the lens of an educational technology framework called TPACK, and explored how technology, specifically online lectures, can benefit higher education. The study will examine the current trend to provide student resources online for face-to-face, blended, and fully online courses, and the factors that lead to success or failure of these online learning experiences. As with any other tool that teachers might use, technology tools can be extremely powerful in assisting the learning process; they can also be a hindrance, leading to confusion; or a novelty that may distract the students from the real focus. It was the goal of this study to examine the use of Internet based lectures and learning experiences in an effort to help this type of technology use find its place in higher education.

The effectiveness of the movement to put lectures and other media online for students to view on their own is beginning to be studied. In June of 2009, the US Department of Education released the results of a meta-analysis that compared the effectiveness of face-to-face courses with online courses and hybrid or blended courses. Their results showed that the hybrid or blended courses were most effective, followed by the fully online courses and finally the face-to-face courses. However, in June of 2010, the National Bureau of Economic Research published the results of their own experimental study, which showed that students were more successful if they participated in the lectures live, rather than watching them on the Internet (Figlio, Rush, & Yin, 2010). One study out of the University of Michigan found just the opposite – finding that "enhanced transfer of lecture information [occurred] in the video formats relative to the live condition, with students also responding more positively to personalized video presentation" (Dey, Burn, &

Gerdes, 2007, p. 1). Another study found that technology-advanced students preferred text-based online resources where lesser technology capable students preferred the use of video resources; although there were circumstances in which both groups preferred video resources when it was tied to projects that the students needed to complete (Li, Leh, Fu, & Zhao, 2009). Larson & Sung (2009) recently published their findings comparing student performance between fully online, blended, and face-to-face sections of the same course and found that there was no significant difference. While studying the design of effective common reference points for online conversation, Wise, Padmanabhan & Duffy (2009) found that:

> while it might seem that rich representation of a concrete situation would be the easiest for learners to connect to, this study found no benefits to using video instead of a [text-based] theoretical description. Thus, designers should focus their energies on carefully crafting the content of text-based reference points instead of engaging in the multitude of issues related to creating and deploying video (p. 335).

With so much contradictory evidence, the assumption can be made that there are other factors in play that are not being accounted for. The environment of the classroom where lectures are being delivered is fairly well defined, as most classrooms are, and able to be controlled by the professor, but the environment in which the students are listening and watching the recorded lecture is a huge variable. Therefore, one question that needs to be answered is "What strategies are successful online instructors employing to try to control the environment for their online students?" Along the same lines, "How do successful online students engage with these lectures while listening to them?" – do they

stop and replay sections, take notes, listen more than once, and are there other variables that contribute to the effectiveness of these online multimedia resources? The final question to be studied concerning the instructors is, "What is their skill and confidence level with the technology tools and what kind of pedagogy are they employing to help their students be successful with this type of content online?"

This study examines how instructors are using online lectures at a small private university in central California and the effectiveness of the online lectures in achieving student learning. This study was based on a small group of professors, some of whom had been using online lectures for several years, but had not yet analyzed their practice or fine-tuned their pedagogy to make sure that their online lectures provided the maximum benefit toward achieving their desired student outcomes. Using an *action research* methodology, the goal of this study was to not only fine-tune pedagogical practices, but also to formulate a simple theory for any online instructor regarding the effective use of online lectures (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003). This study will add to the existing literature on effective online teaching pedagogy with the desire of helping online instruction become more effective.

The Problem

A case had arisen at my small private non-profit university where professors had been using online lectures for a couple of years in both fully online and blended courses. It took a considerable amount of time and effort to create these lectures and the time had come to evaluate their effectiveness. In a recent meeting with the instructional designer at the Center for Online Learning (who is also the author of this study), the instructors were shown how to gather information from the course management system (CMS) regarding

the student use of the online lectures. Many of the instructors were surprised and shocked to learn that only a few of their students were even watching or listening to all of their lectures. It was decided that the professors wanted to increase the student use of the lectures initially to the point where all students actually viewed each lecture but with an ultimate goal that the students would replay some portions of the lectures to increase understanding of the concepts being covered and truly engage with the lecture content. This seemed to be the perfect situation to study their practice with regard to using online lectures in an effort to increase their effectiveness and develop more student engagement with these lectures.

As these informal discussions continued it became clear that a considerable amount of time and thought was being put into the content of these lectures. However, none of the instructors had given much thought to the design and format of their online lectures. It was at this point that the emphasis for this study came into focus. As the instructional designer for the university, the author decided to design a template for online lectures using elements from research and established learning theories and best practices to guide the instructors, helping them frame their lectures in a format that would increase their effectiveness. The researcher hypothesized that there were pedagogical factors in addition to design factors that needed to be identified before an effective solution could be determined. That set the stage for this research study.

At the same time, through the process of self-study and review, some of the programs within the university recognized a need to compress the time frame for their programs, but to do so in a way that would maintain their Carnegie unit-hours. These programs decided to move to a blended format where some of the instructional time would

take place online and the remaining time would be face-to-face in a classroom setting. Some of the instructors for these blended courses have decided to "flip" their courses to make better use of their class time and have the students come to class already having listened to the lecture for the day. These instructors were also invited to take part in this study due to their immediate need to put an effective lecture online.

The Purpose of this Research

The purpose of this action research study was to improve the practice of using online lectures at my university, focusing on the development and design of the lecture and the pedagogical practice of how the lectures are used.

Overview of the Project

The goal of this study was to help instructors to design and develop effective online lectures. The essential idea is to apply the design of a lecture template to the development of online lectures and fine-tune its use through the principles of action research with the goal of creating effective online lectures, which result in student achievement and satisfaction. Through the use of the template and suggested pedagogical strategies for using online lectures as a starting point, instructors participated in two complete cycles of review and modification to both the template and the pedagogical practices in order to develop an effective combination. "Effective" online lectures were defined through student achievement, student satisfaction and teacher satisfaction (which are three of the Five Pillars of Quality Online Education established by the Sloan Consortium). The study included gathering data from two populations: the instructors who used online lectures, and the students in their courses who viewed the lectures.

Using the principles of action research, this researcher worked closely with the group of instructors who were using online lectures to analyze the data and determine the modifications that were needed for both design as well as pedagogy.

> Action research is an interactive inquiry process that balances problem solving actions implemented in a collaborative context with data-driven collaborative analysis or research to understand underlying causes enabling future predictions about personal and organizational change (Reason & Bradbury, 2001, p. 3).

The main participants in this research study were university instructors with a desire to develop effective online lectures for their blended or online courses. They worked closely with the Instructional Designer from the Center for Online Learning (the principal investigator) in small group and individual meetings to develop the technology skills that were needed to record their lectures for online delivery as well as to become familiar with the elements of the lecture template and pedagogical strategies that accompany it. Once the lectures were ready to deliver, they were linked inside of the Course Management System (CMS) course shell for the students to view. A short survey followed each lecture to garner the students' perspective and be taken into consideration for modifications to the template. After the first round of student data was collected and analyzed, the instructors met together as a focus group to decide on modifications to the template and the pedagogical strategies for using the online lectures. The modifications were made and a second round of lectures were developed, and the cycle of data gathering and analysis was repeated.

Mid-State University is a private non-profit university that enrolls approximately 3700 students in undergraduate, adult, and graduate degree programs on its main campus and four regional centers. It offers bachelor's and master's degrees in the arts, sciences and professions through traditional undergraduate, degree completion and online programs.

The participants in this study were instructors from Mid-State University who teach either fully online or blended (online plus some face-to-face meetings) courses, and their students. A few of these instructors had been putting their lectures online for several years with varying degrees of success and the others were new to using online lectures. They are all subject matter experts but have had varying degrees of instruction or training in teaching methods or learning theories. The students in their courses are primarily graduate and adult (degree completion) students, not traditional undergraduates.

Chapter 2: Review of Literature

Many experienced professors in higher education use lectures as a major part of their teaching pedagogy. They are also familiar with using teaching strategies along with their lectures that have worked well in face-to-face classrooms for years. As more and more of our experienced professors are being asked to teach online and blended courses, it is necessary to find ways to allow them to continue to teach in a similar manner, using their strengths. Developing effective online lectures and strategies to employ along with the lectures has become a major priority for many university professors. Within the following literature review there is supporting information about online education in general, online teaching pedagogy, lectures, learning theory, today's college student, and a framework that helps to bring it all together. This literature provides the base for developing a template for online lectures as well as the pedagogical strategies for using them.

Online Education Today

The state of online learning in higher education is studied by several well-known organizations including EDUCAUSE and the Sloan Consortium as well as many interested educators in higher education. Current data regarding many elements of online learning is available from the EDUCAUSE and Sloan-C websites or published in scholarly journals highlighting many recent studies.

The Sloan-C group is a consortium of institutions, organizations, and individuals who are committed to the issues of quality in online education. In analyzing effective online practices they focus "on five pillars of quality in online education: student satisfaction, access, learning effectiveness, faculty satisfaction and institutional cost effectiveness" (Moore, 2009, p. 1). These "pillars" will be referred to periodically

throughout this paper as they are widely accepted in higher education to assess online education. The Five Pillars of Quality Online Education are:

- Learning Effectiveness: The quality of learning online is demonstrated to be at least as good as the institutional norm.
- Cost Effectiveness & Institutional Commitment: The institution continuously improves services while reducing costs.
- Access: All learners who wish to learn online can access learning in a wide array of programs and courses.
- Faculty Satisfaction: Faculty are pleased with teaching online, citing appreciation and happiness.
- Student Satisfaction: Students are pleased with their experiences in learning online, including interaction with instructors and peers, learning outcomes that match expectations, services, and orientation. (Moore, 2005, p. 2).

According to Sloan-C, over twenty percent of all U.S. higher education students were taking at least one online course in the fall of 2007, and by 2010 that had risen to thirty-one percent. That means that over 3.9 million students were enrolled in an online class in 2007 and over 6.1 million students in 2010, and it has been growing at a rate of over 10 percent per year since 2002 (Allen & Seaman, 2008, 2011). These annual studies also showed that the overwhelming reason to offer online courses was to meet the needs of the current student population. One additional element of the report showed that universities increasingly believe that online education is vital to their school's success.

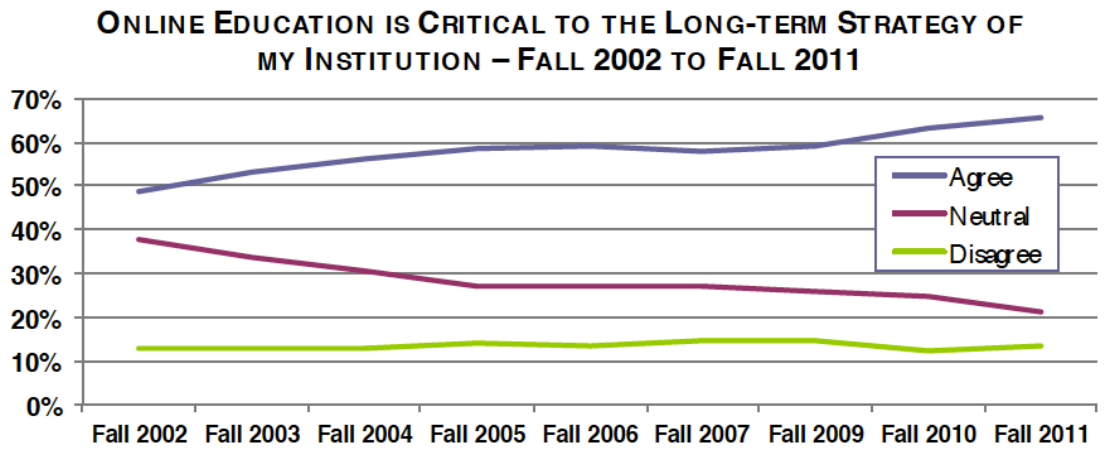

Figure 1. Online education is critical to long-term strategy

The 2009 study of undergrads by EDUCAUSE also shows some interesting trends with the use of technology in higher education. Of the over 30,000 respondents in the 2009 survey, 88.9% of the students claimed that they were using an online course management system (CMS). Many instructors will use a CMS along with face-to-face courses to supply additional resources and to carry on conversation beyond the time and space constraints of the classroom. Other instructors will use the CMS to teach fully online or in a blended fashion. With such a high percent of students claiming to use the CMS, the question becomes: how effective is the use of this online content? Other key findings concerning the undergrads show a trend toward mobile computing. Ownership of desktop computers over the past four years has fallen from 71% to 44% where ownership of laptop computers has risen from 65.4% to 88.3%. In addition to the movement to laptops, 63% of the students claimed to own (or planned to own within twelve months) a handheld device capable of accessing the Internet. These findings show that the Sloan-C Pillar of "Access" is growing stronger all of the time.

TPACK

Until recently, research in educational technology revolved mainly around case studies, best practices, and implementation of new technology tools, and it has been often criticized for not being based on a theoretical foundation (Mishra & Koehler, 2006). However, after several years of a design experiment, based on the work of Shulman's Pedagogical Content Knowledge (1986), the Technological Pedagogical Content Knowledge (TPACK) framework has emerged and is growing in popularity with educational technology research.

Shulman (1986) proposed that instead of preparing teachers with a strong background in a content area and a totally unrelated knowledge of pedagogy, that teacher preparation programs would be more effective if they developed specific knowledge at the intersection of the content and pedagogy, in other words, teaching different content required different pedagogy. Mishra & Koehler introduced the addition of technology and showed that there are even more complex interactions between Technology, Pedagogy, and Content Knowledge.

Within the domain of technology, there exist many types of knowledge, from hardware, to programming, to use of applications, and more. Just like in the domain of pedagogy, there exists knowledge of multiple teaching strategies including lecturing, assessment, hands-on activities, and more. It is, however, at the intersection of these two domains (TPK) where certain knowledge of technology interweaved with pedagogy will be valuable to an instructor to be successful with using technology to enhance their teaching.

In the same manner, the intersection of technology and content knowledge (TCK) and the intersection of pedagogy and content knowledge (PCK) are also important sub-

domains of specialized knowledge for teachers to consider. (see image below) However, it is at the complex intersection of all three domains (content, pedagogy, and technology) where a unique new type of knowledge exists for teachers to understand:

> This knowledge is different from knowledge of a disciplinary or technology expert and also from the general pedagogical knowledge shared by teachers across disciplines. TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of student's prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build existing knowledge and to develop new epistemologies or strengthen old ones" (Mishra & Koehler, 2006, pp. 1028-1029).

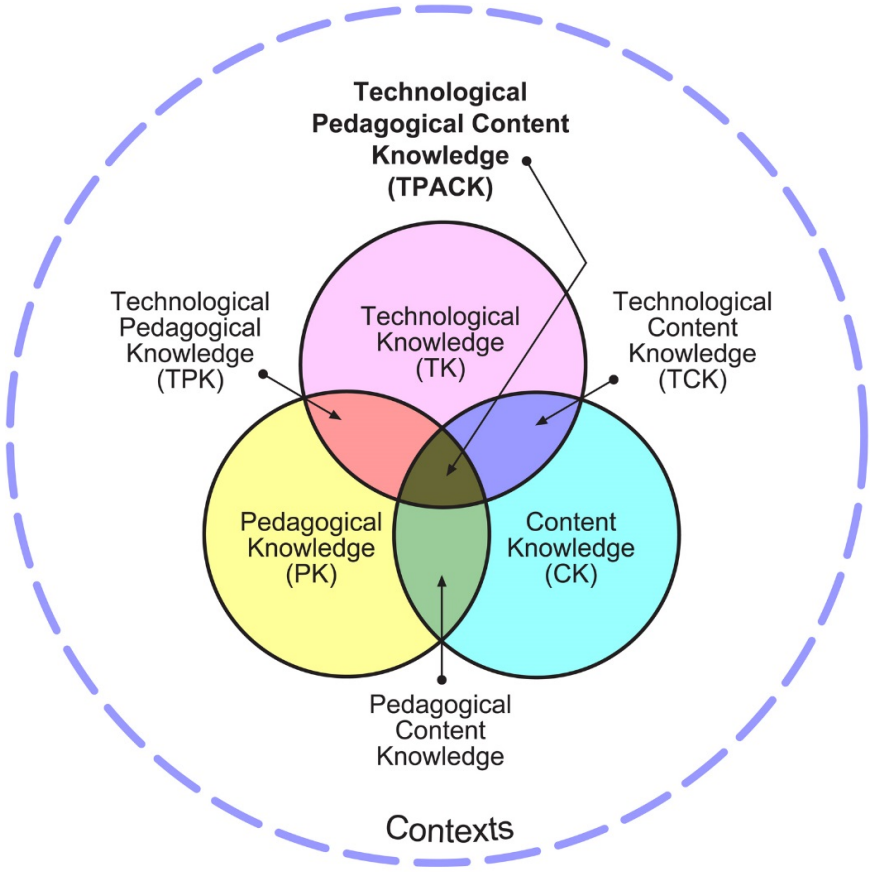

Figure 2. TPACK (used by permission from tpck.org)

Although the TPACK framework is increasingly being used as the foundation for new research, much of the following literature review contains elements from the body of knowledge that focuses on mainly one domain of the framework, either Pedagogy or Technology, as Content Knowledge is typically not the focus of educational research.

Using the key principles of action research as guidance, this study took place with a small group of online instructors working together with the instructional designer. Using the data collected from students as well as data and feedback from the faculty, the group determined appropriate action to be taken in regards to the design of lectures as well as the instructional strategies for using online lectures.

Hsi (1998) describes elements of design research, which are similar in many ways to action research as, "all the independent variables in an instructional context, tools, activities, and people mutually constrain each other and are studied in concert within a theoretical framework" (p. 3). In this case the framework is TPACK. Each instructor involved in the study has individual knowledge and skills in Technology, in Pedagogy, and in Content Knowledge (TPACK), however, they had not as yet evaluated their practice as a community through the lens of the TPACK framework. Initial conversations indicated that most of the professors had focused primarily on the Technology and the Content Knowledge and had not spent as much time thinking about their Pedagogy. These initial conversations already had the instructors thinking about pedagogical changes and they were primed and ready to discuss ideas to improve their students' online engagement.

Technological pedagogical knowledge (TPK) for using lectures in a face-to-face classroom setting might be limited to using a PowerPoint presentation along with the lecture or possibly student response devices that could help with checking for understanding; however, when the lectures are delivered online the options increase for TPK. Tried and true non-technological pedagogies used in face-to-face classrooms can be converted into technology-based pedagogies. For example the "Think-Pair-Share" could turn into a back-channel Skype discussion with a fellow student, and the transcripts posted or emailed to the instructor. The commonly used "One Minute Essay" could be a quick forum post or text message to the instructor (Cunniff et al., 2005). Traditional "note taking" could possibly become students creating a wiki page with important lecture content or simply uploading student notes for the instructor to view. A link to a digital advance

organizer could even be used to allow students to have a little more structure or scaffolding if necessary (Ausubel, 1963).

The TP opportunities for online lectures will in some part be determined by the technology tools that the instructors use to deliver their lectures. Some tools, like VoiceThread, allow for the students to leave comments or questions on each slide of the presentation/lecture. Some screen capture tools like Camtasia, and web-based applications like BrainShark and YouTube, also allow the instructor to embed questions or quizzes within the lecture.

Online Learning Research

The investigation of the effectiveness of online learning has been increasing for the past decade. Much of this research has concentrated around several major topics including the use of online discussion forums, the development of "Identity" in an online setting, the student's ability to self-regulate their online learning experience, and the role of community or social learning elements within web-based learning environments. A review of recently published studies covering the previously mentioned topics of online learning will help to set the stage as we investigate the way that students and instructors use content-laden media within online learning spaces.

Discussion forums have been a mainstay of online instruction for many years. The behavior of students in these online learning communities plays a vital part in their effectiveness. Three of the most common roles that students assume in online discussions are "information providers, opinion providers, and troublemakers" (Yeh, 2010, p. 140). Experienced instructors typically mediate face-to-face discussions very well, but due to the asynchronous aspect of online discussions, it is up to the students to take a part in

mediating these learning activities. By understanding these online roles and their associated behaviors, instructors can improve their online teaching methods.

Due to the overwhelming popularity of the use of the forum in online and blended courses (Sharpe & Pawlyn, 2009), a correspondingly large amount of research has been done on the use of forums (also known as moderated online asynchronous discussion boards; Vlachopoulos & Cowan, 2010). One of the topics of interest of the study is how much the instructor (or moderator or tutor) participates in or directs the discussion. Salmon (2003) studied the effective use of generalist tutors moderating discussions, but depending on the purpose for the forum and the desired student learning outcomes of the experience, there may be more of a need for the instructor's presence in the discussion board. Garrison and Anderson (2003) describe a conceptual framework for online learning that consists of three elements: cognitive presence, social presence, and teaching presence. This framework would suggest that positive online learning environments (including the widely used discussion forum) would need more than a generalist tutor/moderator and according to Anderson, Rourke, Garrison, and Archer (2001) the facilitator would need to be:

- The designer of the educational experience;
- The facilitator and co-creator of the social environment;
- And the subject matter expert, who knows more than most learners and therefore is in a position to scaffold learning experiences through proactive prompting.

One could argue that student self-regulation is even more important in online learning situations than it is in face-to-face learning (Artino & Stephens, 2009), and many of the commonly used web-based learning environments contain tools to assist students to

regulate their progress in the course. Self-regulated learning involves "metacognitive, motivational, and behavioral processes that are personally initiated to acquire knowledge and skill, such as goal setting, planning, learning strategies, self-reinforcement, self-recording, and self-instruction" (Hsu, Ching, Mathews, & Carr-Chellman, 2009, p. 110). When online instructors understand how successful online students use web based tools to assist with these processes, they can provide scaffolding to support their students. Hsu et al, found that successful students used the built-in online calendar, monitored their progress through the online gradebook, and found ways of taking notes from reading off the screen in a manner that worked for each of them (for example, handwritten on paper or typed in a word processor; Hsu et al., 2009). This is an important factor to consider when pursuing the topic of producing online lectures. Can instructors develop their online lectures in such a way in which note-taking from the lectures is easier for the students? Perhaps some type of digital advance organizer could be utilized (Ausubel, 1963).

Pedagogy and Best Practices for Online Instruction

Regardless of how much research is published on the topic of effective online teaching, much can be learned from simply listening to a few successful practitioners. Bill Pelz has been recognized by Sloan-C for Excellence in Online Teaching and shared some of his ideas about successful online teaching in a recent journal article. In some colleges and universities, a team approach to developing online courses with a content expert, an instructional designer, a media developer, and perhaps a technology or CMS expert has proven effective. In most small universities and community colleges the instructor plays all of these roles in the development of their online courses. For professors who design and teach online courses by themselves, it is difficult to distinguish "between effective teaching

and pedagogically sound instructional design" (Pelz, 2010, p. 103). Pelz (2010) continues, "If I create an environment in which a majority of students gladly learn that which they and I deem relevant and salient, then have I succeeded as a teacher or as a designer?—and does it matter?" (p. 103). He sums up his ideas on successful online pedagogy in the following outline, but if one is to look at his actual implementation of this outline it is immediately obvious that he provides an amazing amount of structure and support.

A. Let the students do (most of) the work
    a. Student-Led Discussions
    b. Students Find and Discuss Web Resources
    c. Students Help Each Other Learn (Peer Assistance)
    d. Students Grade Their Own Homework Assignments
    e. Case Study Analysis
B. Interactivity is the heart and soul of effective asynchronous learning
    a. Collaborative Research Paper
    b. Research Proposal Team Project
C. Strive for presence
    a. Social presence
    b. Cognitive presence
    c. Teaching presence

To introduce students to his view of online discussion forums, Pelz provides several ungraded "icebreaker" activities. These activities allow students to learn how to lead an online discussion as well as how to reply to content that other students have submitted. The detailed instructions provide the students with a focus as well as the scope and sequence of the assigned activity. These "icebreaker" activities provide an opportunity for the students to practice the skills that will be needed throughout the course. This is a great

example of what is meant by "scaffolding"- a term used in constructivist learning theory, which refers to what the instructor provides to support the students' learning process.

Pelz's ideas on successful online pedagogy align with Chris Dede's ideas on successfully teaching the new millennial learners. Dede suggests that instructors address the following ideas in order to effectively teach the new millennial learner:

- *Co-Design:* Developing learning experiences students can personalize
- *Co-Instruction:* Utilizing knowledge sharing among students as a major source of content and pedagogy
- *Guided Social Constructivist and Situated Learning Pedagogies:* Infusing case-based participatory simulations into presentational/assimilative instruction
- *Assessment Beyond Tests and Papers:* Evaluating collaborative, non-linear, associational webs of representations; utilizing peer-developed and peer-rated forms of assessment; student assessments provide formative feedback on faculty effectiveness. Many faculty will find these shifts difficult, but they must themselves experience mediated immersion and develop 'neomillennial' learning styles to continue effective teaching as the nature of students alters. (Dede, 2004, p. 2).

Many of these principles for connecting to the current generation of college students lean toward utilizing online tools and at first glance might seem contrary to what we think when we hear the word "lecture"; however, online lectures can allow for more opportunities to bring together social and collaborative elements over traditional in-class lectures. This is one of the areas where TPACK helps us frame the differences. In a traditional face-to-face classroom, a lecture might bring together Content and Pedagogy, but when technology is

added to the equation, as with an online lecture, the students are free to engage in social activities or collaborative assessments as never before.

Digital learning environments are multidimensional settings, and understanding how our students learn in these environments is beneficial to improving our instructional design (Li, Leh, Fu, & Zhao, 2009). "Online instructors need to take on a multi-dimensional role and to be an effective online educator they are required to possess a varied and wider range of competencies" (Bawane & Spector, 2009, p. 383). In their study, the roles that instructors need to fulfill were prioritized in the following order: pedagogical roles, professional, evaluator, social facilitator, technologist, advisor, administrator, and finally, researcher. So, in addition to the students navigating multiple roles in online education, the instructors need to be competent in many roles as well. This has implications for teacher education as well as how universities determine whether teachers should be teaching online courses or how to provide in-service training for their online instructors (but that is a topic for a different study).

According to Fish and Wickersham (2009),

> teaching online requires a faculty member to think differently about teaching and learning, learn a host of new technological skills and engage in ongoing faculty development for design and development of quality online instruction, and play the role of teacher, learner and technical support. (p. 283)

Fish & Wickersham (2009) support the ideas of Bawane & Spector (2009), and provide a series of reminders for online instructors and university policies in their recent literature review. Among the highlighted best practices are: "effective online course delivery requires more than simply repackaging existing traditional course content" (p. 279); when

teaching adults, the instructor is more of a "facilitator of learning than a deliverer of content" (p. 280); online course development requires commitment, enthusiasm, and university support (p. 280); student support (p. 281); and manageable student/instructor interaction (p. 282), which aligns with the Sloan-C pillar of student satisfaction. This is also notable for converting lectures that may have been used many times in face-to-face settings into online lectures. Instructors need to realize that they may need to learn a few new skills and spend more time planning and preparing than they did for their face-to-face lectures.

Learning Theory – As It Relates to Online Teaching

Life is education. From the very moment of birth until our last breath, we are continually learning. Dewey (1916) wrote a considerable amount about how every person is born into a social group without language, beliefs, or social standards, and in order for the life of that group to continue, the society must pass on their knowledge and customs. "With the growth of civilization the gap between the original capacities of the immature and the standards and customs of the elders increases…Deliberate effort and taking of thoughtful pains are required…Education and education alone, spans the gap" (Dewey, 1916, p. 3).

As educational theorists built on Dewey's ideas, Vygotski and Piaget led the understanding in the active process of learning. More recently, a look into the social elements of learning has developed into a new branch of constructivist learning theory branching from Social Learning, called Situated Learning. Leading the way with research and dissemination in the area of Social Learning are Jean Lave & Etienne Wenger. At the heart of their premise is the idea that effective learning happens when it is learned in

context with how it is applied (Lave & Wenger, 1991). In contrast to how schools usually operate, this type of learning does not rely on simply disseminating abstract content to the learner in the hope that they can transfer that new knowledge to a real situation; rather, the learner engages in a real situation and learns through the social situation with the assistance of observation and interaction with others who have more knowledge of the subject. Although this type of learning has roots in the days of apprenticeships, it can also be applied to modern technology situations. When technology can be used to create the context in which the new knowledge is to be employed as well as a social environment connecting the learner to the community of practice, powerful and effective learning can be achieved even when the actual participants are not present in the same location. With this in mind, instructors of online courses might want to consider ways to utilize technology tools that allow their teaching to be situated in authentic contexts. This is one place where online lectures can differ from traditional classroom-based lectures. Computer generated visual aids, the ability to pause to interact with the content or other learners (or the instructor in a virtual setting), to rewind or replay sections can help online lectures appear to be situated in more authentic contexts.

When designing online learning settings, the instructor (designer) must determine the ultimate goal of the course prior to designing activities and including collaborative/interactive methods. For example, if the goal of the course is outcome based, with a specific task or skill to be mastered, the use of collaboration and social interaction will complicate the matter with a multitude of unforeseen variables, and neither the instructor nor the students will be satisfied with the results (Kirschner, Strijbos, Kreijns, & Beers, 2004). It is a paradigm shift for the instructors/designers from the world of

knowledge (outcomes) to the world of learning (process).

Social Learning Theory, introduced by the work of Julian Rotter (1940s) and expanded by Albert Bandura (1970s through 1990s) has been the foundation for much recent research and publication. As mentioned above, it is closely related to the work of Lave & Wenger's Situated Learning. In a recent meta-analysis, Hill, Song, & West (2009) examined web-based learning environments (WBLEs) through the lens of social learning theory constructs focusing on context, culture and community, and learner characteristics. The following table represents some of their findings regarding how WBLEs are used to support the constructs of Social Learning.

Table 1

Application of Social Learning Constructs in WBLEs

Construct		Applications in WBLEs
Context	Interactions	* Provide opportunities for creating and sharing in-depth messages * Enable support by more knowledgeable others * Encourage interaction by the instructor and peers
	Group and class size	* Monitor group size to enable support from more knowledgeable others (i.e., peers) * Monitor class size to enable consistent and engaged interaction
	Resources	* Encourage effective use of postings and other resources * Provide strategies to identify. Interpret, and utilize resources
Culture and Community	Culture	* Facilitate online interactions so they meet the needs of learners from a variety of cultures * Provide multiple formats for communication to meet differing cultural needs

(continued)

Construct		Applications in WBLEs
	Community	* Facilitate connection-building in small and large groups * Support collaborative activities
Learner Characteristics	Epistemological beliefs	* Take into consideration reflective thinking abilities * Gain an understanding of epistemological beliefs of students to guide design
	Individual learning styles	* Gain an understanding of learning styles to guide design * Enable different levels of interaction to accommodate individual learning styles
	Self-efficacy	* Enable choice in interactions to minimize social anxiety * Promote self-regulated learning
	Motivation	* Incorporate authentic activities * Send messages regularly to motivate learners

One recent study, which focused on an effort to combat poor retention rates for online courses, found that some online instructors are doing a poor job of fostering a sense of community and social connectedness, as students report a lack of interpersonal interactions as a major reason for being unhappy with online courses (Slagter van Tryon & Bishop, 2009). In order for computer mediated learning environments to be effective, the students need to engage, and students tend to engage at a level in which they perceive others being engaged. This requires the designer of the online learning environment to provide a social community that fosters both instructor/student as well as student/student interactions that develops into high levels of engagement. (Slagter van Tryon & Bishop, 2009).

The instructor's social presence in an online setting is a key factor for student engagement. "The effectiveness of group learning in asynchronous distributed learning

groups depends on the social interaction that takes place" (Kreijns, Kirschner, Jochems, & Van Buuren, 2004, p. 155). Kreijns et al. (2004) elaborates on several positive and negative factors involved in the use of computer-supported collaborative learning (CSCL) environments. On the positive side, they allow learners to be separated by both time and distance "allowing the formation of distributed learning groups consisting of member originating from different countries" (p. 155), as well as facilitating teaching and learning that relies on social interaction between group members. However, according to Kreijns et al. (2004), the barriers that need to be overcome in order for effective group learning to take place are:

1. "There is no suitable CSCL pedagogy
2. Computer mediated communication is [primarily] text-based, leaving out non-verbal and back-channel cues
3. CSCL environments may not meet the criteria for interaction design and usability" (p. 156)

According to their research, "the effectiveness of a (a)synchronous distributed group depends on whether a sound social space has emerged, indicating the establishment of a community of learning. In a sound social space, open dialogue and social interaction are possible, enabling cognitive processes such as elaborating, questioning, and defining to take place" (p. 156).

Many of these barriers can be addressed through online lectures. First and foremost, the instructor's presence is perceived in a very tangible way when the students hear his or her voice and possibly see his or her face on the screen. In some ways it might even seem more personal because the students can feel like they are the only one to whom instructor

is speaking. Next, the communication is not all text based, and the expression and enthusiasm in the teacher's voice comes across to bring life into the topic. Finally, through the use of forums, live chat, or other online collaborative tools, the students can interact with the content and each other in a "sound social space".

Even before modern computer mediated communication was conceptualized, Short, Williams, & Christie (1976) proposed their Social Presence Theory. Social Presence research was based on the premise that face-to-face communication has the highest degree of social presence and text-based communication has the least; during the early studies activities such as audio communication and interactive television communication were studied. Today, most of the research on social presence involves newer communication technologies, typically Internet-based communication. Much of the research has focused on the media's ability to convey complex communication. Over time, however, the thinking about social presence has shifted from an attribute of the media to a quality of the relational system (Kehrwald, 2008). Kehrwald showed that even in a "lean" media such as online text, social presence could be effectively accomplished when the facilitators and the students had the combination of skills and abilities to achieve "salient interpersonal interactions" (p. 99). Even though current thought on social presence emphasizes the quality of the relation that is fostered in the communication, the type of media used can still influence the degree to which social presence is perceived (Biocca, Harms & Burgoon, 2003). Online lectures are a great way to build the instructor's social presence and can lead to high quality interactions between student/student and student/teacher within a blended or online course. Simple additions to the online lecture such as adding a picture of the instructor or a short video clip can greatly enhance their social presence to their online

students.

As one scours the literature of online learning communities and social presence, there seems to be a void of research comparing the difference between single (stand-alone) learning experiences and cohorts (or cadres) of students who go through a series of courses (or an entire program) together. One could posit that the development of a learning community and social presence in an online learning environment would be greatly enhanced when the same group of learners stayed together for a longer period of time. It would solve the problem of learning how to skillfully use the web-based learning environment (Hill, Song, & West, 2009), allow the novice online learner to develop the skills related to social presence (Kehrwald, 2008), and improve retention rates by fostering greater student engagement (Slagter van Tryon & Bishop, 2009). Cohort based online learning would be an excellent topic for future studies.

The term *Learning Community* is quite often used by educators who might not fully understand the true meaning; a community is a "multigenerational group of people, at work or at play, whose identities are defined in large by the roles that they play and the relationships they share in that group activity" (Riel & Polin 2004, p.18). The community's activities sustain the life of the group by continuing to turn novices into experts. Most educational settings involve many novices (the students) and one expert (the teacher), and would stretch the definition of a learning community at best. That does not mean that an intentional learning environment could not become a true learning community, but the designer of the learning environment needs to be aware of the characteristics of a community if it is their goal to develop their course into a learning community.

Riel and Polin (2004) continue to help educators understand three distinct types of

learning communities that may be possible to develop in an online setting. The task-based learning community is presented with an explicit goal. "Their shared goal is the communal use of diversity to achieve a deeper understanding of issues, to find a solution to problems, or to complete a task in a way that is beyond the capabilities of any single person" (p. 21). Practice-based learning communities are formed around a specific practice where members share their work, learning from each other and advancing the work of those who came before. Open source software programming is a perfect example of this type of learning community, in which the members continue to learn from each other and build on to the previous work (Reil & Polin, 2004). The third and final type of learning community is the knowledge-based learning community:

> A knowledge-based learning community seeks to advance the collective knowledge in a subject or field of inquiry, and to do so in a way that supports the growth of each of the individuals within the community, that is, the intentional development of experts within the community (p. 32).

Their proposed framework for educators is the marriage of elements from all three of these learning communities into what is called a Learning Organization (Reil & Polin, 2004). Once established, the learning organization continues to build on the previous generations of work: as participants come and go, the organization flourishes. Although the scope of this study is simply to produce effective online lectures, one could posit that online lectures could be a valuable asset to a learning community by being added to the community's archives and being available for many years to come, providing instruction to novices as well as a historical artifact for the organization.

Today's College Student

The largest group of today's college students is the Millennial generation. Born between 1980 and 1995, they are also known as the Net Gen, Next Gen, Generation Y, M Gen, and Echo Boomers. They are the second largest generation in U.S. history (only smaller than the Baby Boomers). They are impatient, experimental learners (prefer learning by doing & interacting), digital natives, multi-taskers, gamers, expect nomadic connectivity 24/7, and expect personalization & customization (Sweeney, 2006). This is the generation for whom the iPod replaced beer as the most important item for undergrads (Lorenzo & Dziuban, 2006). Implications for academe include:

- They expect increased learning options and more educational services from their college or university.
- They are more engaged through active learning.
- Experiential processes, case studies and simulation speed their learning and hold their interest.
- They opt for convenience and flexibility.
- They want quick and personal feedback; slow assessment and response will cause them to lose interest.
- They expect information and services to be available online. (Sweeney, 2006)

When asked what type of resources they turn to for academic assignments, 98% responded with a Google search, 58% said Wikipedia and only 22.5% said that they use research databases like EBSCO or ProQuest (Nicholas, 2008).

In the EDUCAUSE Center for Academic Research's (ECAR) 2009 study of undergrad students, trends can be seen in that this generation is moving toward more mobile devices, they frequently use social networking and text messages to stay in virtual constant contact

with their "friends", and they feel very comfortable using their university's course management systems (CMS). One interesting finding was that only 15.4% of over 30,000 surveyed said that they would possibly skip class when they knew that the lecture content was provided online (Smith, Salaway, & Caruso, 2009), which should alleviate a professor's fear that by putting their lectures online, the students would stop coming to class.

When looking at mobile computing, the majority of students feel that in the next few years they will be able to do nearly everything on a mobile device for which they currently use a computer (Smith, Salaway, & Caruso, 2009). The past three Horizon Reports have listed mobile computing as one of the hottest trends for higher education to take notice (2008, 2009, 2010). According to the Pew Internet & American Life research group, Blogging is down, Social networking is way up, and Twitter is on the rise (Lenhart, Purcell, Smith, & Zickuhr, 2010).

Instructor's Knowledge and Skill with Technology

Although there are many studies that show what types of technology instructors are using (Brill & Galloway, 2007; Peluchette & Rust, 2005; Vannatta & Beyerbach, 2000), and many other studies that talk about the barriers that instructors face concerning technology (D'Silva & Reeder, 2005; Dutton, Cheong & Park, 2004; Weston, 2005), there are surprisingly few studies that actually report on the instructor's knowledge and skill with using digital technologies for their teaching activities.

Beginning with the ELI conference in 2008, the EDUCAUSE community has been developing a list of the top challenges for teaching and learning with technology in higher education. Through round table discussions, focus groups, surveys, interactive brainstorming sessions, and a final community vote, the following five challenges have

been identified:

1. "Creating learning environments that promote active learning, critical thinking, collaborative learning, and knowledge creation.
2. Developing 21st century literacies (information, digital, and visual) among students and faculty.
3. Reaching and engaging today's learner.
4. Encouraging faculty adoption and innovation in teaching and learning with IT.
5. Advancing innovation in teaching and learning with technology in an era of budget cuts." (EDUCAUSE, 2010)

If these are the top challenges facing higher education, it would appear that developing teachers' skills and knowledge in the domain of technology (TK) or specifically in the integration of technology and pedagogy (TPK) is an ongoing concern.

One recent study at BYU looked at the possibility of increasing K-12 science teachers' confidence in multiple sub-domains of the TPACK framework. Measuring their TPCK, TPK, TCK, and TK confidence levels before and after a thoughtfully designed in-service professional development program found that the teachers significantly increased their confidence levels in all measured categories (Graham et al., 2009). This study demonstrates that if professional development activities are designed with TPACK in mind, significant growth can be achieved.

The Lecture

What is a lecture? Anyone who has been in higher education for a number of years remembers the days of going to class and listening to the professor give his "lecture", while

trying to take copious notes for later review. So the lecture could be defined as a transmission of content from an expert to a novice; Webster's defines a lecture as "a discourse given before an audience or class especially for instruction" (Lecture, n.d.). In most traditional classrooms across the globe, this transmission has taken place in a large classroom or lecture hall in order to minimize the number of times that the professor needs to repeat the content. At first glance this seems to be a perfect application for some of today's modern technology. The content can be recorded and made available to the students online, and as long as the content is valid the recording can be used over and over.

According to Cunniff et al. (2005),

> the lecture is the most commonly used didactic tool. Although the lecture requires a lot of preparation time for the instructor, it is viewed as being most 'cost effective' when compared to other learning/teaching methods. However, the lecture is often acknowledged as the least 'engaging' method of teaching if the student is not actively involved. Discussion-based methods are superior in many ways with regard to the desirable end-points of instruction, including improved problem-solving skills and increased student retention of information after the course has ended (p. 4).

The lecture originated in academic settings around the sixteenth century. Prior to the abundance of printing capabilities, students were gathered together for the reading of information from the few printed books. It has evolved into one of the main teaching methods for secondary and higher education, and many veteran teachers are masterful with their delivery of lectures. When defining elements which increased attendance with classroom based lectures three elements were found to be important: (a) a high degree of participation and interactivity ('active learning'), (b) a clear structure which enables

integrative links to be more easily made, and (c) a passionate, enthusiastic lecturer, who can bring a subject to life for students. (Revell & Wainwright, 2009). Although widely accepted by many in education as being a cost-efficient way of disseminating important content, the lecture has become the focus of some criticism in the past few decades by educators who seek more student interaction (Bligh, 1972; Kroenke, 1984).

> Laurillard [the Pro-Vice-Chancellor at the Open University] identifies that the lecture is rarely an appropriate learning context due to the limitations of the lecture format in facilitating students' engagement in a learning process. Such a learning process, she notes, involves engaging with material to make sense of it and its structures in light of real-world examples and pre-existing understandings. Ideally this learning process would involve discursive engagement with material and immediate feedback on students' understandings as they construct them. The lecture is, she notes, a grossly inefficient way of engaging with academic knowledge and ill suited to facilitating a learning process. (Tormey & Henchy, 2008, p. 304)

This inherent problem with lectures in a traditional classroom setting can be addressed through recorded online lectures through their ability to pause and respond to prompts, carry on back-channel discussions with classmates without worrying about disturbing the instructor, and the ability to add interactive demonstrations, graphics or simulations within the lecture at key locations. These are just a few ways that Technological Pedagogical Knowledge (TPK) can increase the effectiveness of online lectures.

The Recorded Lecture

For many years, live lectures have been recorded for use by students who either could not be present at the live lecture or who wanted to listen to the lecture multiple times.

These recorded lectures have been on audio tape, video tape, and more recently computerized digital media. As long as educators have been recording lectures for student use, research studies have sought to determine the effectiveness of using those recorded lectures. In 2001, an article was published containing an 18-year span of studies on this topic where the conclusion of every study was that there was no change in student achievement. In other words, the recorded lectures were as effective as the live lectures (Wofford, Spickard III, & Wofford, 2001).

There are many ways to record an instructor's lecture. First and foremost is to simply record a live class session when the professor is giving the lecture. This can be done manually by a media development specialist or automatically with the use of some of today's lecture capture solutions provided by some of the companies that were mentioned earlier. This type of production can also be done in the privacy of a small office or recording studio, where the instructor presents their content directly to a video camera or software recording program. Growing in popularity is a method of capturing the audio narration of the professor while at the same time recording the display of a computer screen, often running a PowerPoint type of slide show, thus generating a product containing the professor's words along with the visual aids of a presentation that plays like a movie. (For the remainder of this paper, this will be referred to as "narrated screen capture".)

Many professors also utilize audio only lectures. These lectures may be recorded on any simple digital voice recorder and uploaded into the online course shell of any CMS. In addition, these audio only lectures are easily transferred to mobile players, which allow students the flexibility to listen to them in any situation. These lectures are often referred

to as “podcasts” and can be set-up to include a digital subscription called RSS, which automatically pushes the recording out to the student’s computer. Podcasts have been the focus of several studies and findings have shown that they are very helpful for distant learners not only to assist in the learning process but also to bring a sense of belonging and social closeness (Lee & Chan, 2007; Van Zanten, Somogyi, & Curro, 2012). Although the recorded online lectures from this study could have been set up with RSS for distribution and called “podcasts” that is not the focus of this study.

The Online Lecture

Ever since the recording of lectures has been able to be digitized in a computer format, lectures have found their way online, to be used by the students for additional instruction outside of the classroom. The online lecture is a fundamental part of the “flipped classroom”. The flipped classroom is a situation in which the teacher has recorded a lecture for the student to view prior to the class session (typically at home the night before), in order to use the class time to engage in collaborative or problem solving activities that delve deeper into the content that was introduced in the online lecture (Tucker, 2012). Online lectures are also an instrumental part of most fully online courses, especially for instructors who used lectures in their face-to-face courses.

Many studies have focused on the use of online lectures compared to traditional classroom based lectures recently, and most often the results are inconclusive, meaning that there are no statistical significant differences with student success based on the delivery method of the lectures (O’Brien, Hartshorne, Beattie, & Jordan, 2012; Spickard, Alrajeh, Cordray, & Gigante, 2002). However, these studies tried to keep the online and face-to-face lectures as close to identical as possible and were only seeking to determine

the effectiveness of the delivery method. One could posit that if the online lectures were allowed to utilize all of the advantages that the technology could provide, they could be a very effective educational tool. The advantage is to harness the ever-changing intersection of technology and pedagogy (TP), to use the differences as a benefit and not to try to keep the online lectures the same as the classroom lectures.

When an instructor puts their lectures or other content-laden media online for the students to view on their own, it is important to consider multiple factors. First, what is your learning goal for this experience, and is using online media the best way to achieve the desired outcome? Next, who is the student and what is their tendency towards utilizing online digital media? When left to their own devices, students might have the TV going, an iPod in one ear and friends in the room while the online lecture or video is playing on their computer and think that they are "doing their homework". Finally, what can an instructor do to foster engagement between the student and the online lecture? (Blanco, 2008; Cunniff et al., 2005; Wilson & Korn, 2007).

When instructors or media developers take the time to create rich, content-laden media to include in an online or blended course, they often have their mind set only on the content. When an instructional design specialist gets involved in the process, his or her job is to think about the effective use of that media and to achieve the learning objective. In order to accomplish the objective, one must try (as much as possible) to control the students' environment and actions while they engage with the online media. This can take place in several ways. Simple suggestions included with the media - to be in a quiet place where the student is able to concentrate - might go a long way in helping the student truly connect with the lecture. Other activities might include requiring the students to take

notes during the online content delivery and turn in a copy of their notes as a portion of their class participation points, or to write questions as they listen and use an online forum to discuss and answer each others' questions.

According to constructivist learning theory, "Learning is an active process in which the learner uses sensory input and constructs meaning out of it" (Hein, 1991, Principles of learning section, para. 2). Scaffolding is an important characteristic of constructivist teaching and learning whereby the instructor guides the student from what they know to what they need to know (Vygotsky, 1978). Instructors need to provide effective scaffolding to help ensure that the students actively connect to their online delivery of important content. "This connection of an object and a topic with the promotion of an activity having a purpose is the first and last word of a genuine theory of interest in education" (Dewey, 1916, p. 158). So, what can an instructor actually do to help their students get the most from their online lectures? Included within the design template for online lectures is a list of strategies and activities that can be used with the online lecture to maximize the student's engagement and that make use of technology tools that are common to all course management systems and stand-alone Internet based tools.

Research to Support the Online Lecture Template

When combing through the literature concerning student attention spans during lectures, nearly every guide and article on the subject suggests to break up the lecture every 10-15 minutes in order to maintain the student's attention and focus. Although the empirical evidence for this appears to be inconclusive (Spickard et al., 2002), the anecdotal evidence seems overwhelming (Blanco, 2008; Chaney, 2005; Cunniff et al., 2005; Mallein, 2011; Morris, 2009; Scherokman & Waechter, n.d.). So the timing element is a part of the

template design.

The majority of the online lectures with our small group of participants in this study are narrated screen captures, which have a visual component with text and graphics elements. Looking at some of the literature from the design of instructional texts, we learn that graphics and visual aids can be very useful, provided that they do not interfere with the flow of ideas being presented (Glynn, Andre, & Britton, 1986). Research on the use of PowerPoint presentations that accompany lectures is useful for this element of the template. Susskind (2005) provides a summary of studies supporting PowerPoint based lectures increasing student performance. In 2003, Mayer & Moreno published a cognitive theory of multimedia learning which focused on how people learn from words (such as printed text or spoken text) and pictures (such as illustrations, photos, charts, animation, or video), which hypothesized that there is a visual channel and a verbal channel which can effectively process a few items per channel simultaneously (Savoy, Proctor, & Salvendy, 2009). This suggests that the template should recommend that the use of visuals and included media be present but not overwhelming.

Best practices from public speaking has also played a part in the design of the online lecture template and the included pedagogical strategies for using online lectures. Enthusiasm for the subject and other non-verbal cues will carry over into the student's attention and engagement with the lecture (Scherokman & Waechter, n.d.). Factors such as "Focus on your message", "Speak to your audience" (do not read from a script or PowerPoint slide), "Be animated" (include pauses, repetition, vary your pitch) have been included in the instructions for the use of the template (Mintz, n.d., p. 4).

In addition to timing, visual components, and voice considerations the template is based on many of Gagne's (1970) nine general principles of instruction:

1. Gain attention
2. Describe the goal (and expected outcomes)
3. Stimulate recall of prior knowledge
4. Present the material to be learned
5. Provide guidance for learning
6. Provide informative feedback
7. Assess performance
8. Enhance transfer by providing examples
9. Insure retention (Gagne, 1970, p. 304)

The most common current practice for the instructors at my university who create online lectures is to close the door to their office and record their lecture as they scroll through a PowerPoint presentation. These are typically lectures that they have given many times in face-to-face settings and they know exactly what they want to say. However, in the privacy of their closed office, there are no questions from students to interrupt them and they often go for over an hour, blazing through the content and never thinking about the structure. It is apparent that the current practice does not reflect the best practices highlighted in this literature review and needs to be addressed.

Professors may or may not know what the research says regarding best practices for instruction; however, they do not always consider those best practices while in the midst of developing course content in the form of recorded lectures. The implementation

of this study, through the use of a template to guide the development of the instructor's lectures, including suggestions for student engagement as well as the thoughtful reflection and improvement of the online lectures, is necessary to help this method of instruction become more effective in online and blended courses.

Chapter 3: Methodology

With the addition of online tools for education, the use of online lectures needs to be studied and improved if it is to become an effective strategy for instruction. The purpose of this study is to do just that; to attempt to improve the use of online lectures through thoughtful research-based development and incorporated student engagement strategies.

Innovations in the realm of online education continue to be addressed at nearly every college and university in the nation. As new tools allow instructors to attempt new teaching strategies within their online environment, there is a need to evaluate the effectiveness of those innovations. When the desired results are not what was expected or needed, educators have a choice of throwing out the innovation and trying something new, or refining the practice in an effort to make it an effective part of their pedagogy. A point that Bereiter (2002a) makes is that even "a flawed idea, if continually refined, can win out over a better idea that has not had the benefit of as much development" (p. 323). This is the heart of a research methodology called action research, in which the principal researcher works with the participants to refine and improve a process through several iterations of reflection, analysis and change.

The Purpose of this Study

The goal of action research is to make a current practice better, through a systematic inquiry and analysis, which leads to an informed modification of the practice. It is not a haphazard changing of the practice to see if the modification leads to improvement. The gathering of data and subsequence analysis virtually guarantees that the modification will be an improvement to the practice (McNiff, Lomax, & Whitehead, 1996). With this in mind, our university's practice of using online lectures has been moderately successful, but

leaves much room for improvement. The purpose of this study was to improve the practice of using online lectures at our small university, a process that will add to the knowledge base for all universities who use online lectures.

Overview

To accomplish this task, this intervention took a two-fold approach, focusing on the development and design of the online lectures as well as the pedagogical practice of how the online lectures are used. In Cycle I, to address the development and design issue, the participating instructors were asked to follow the "Bese Guide for Online Lecture Development" which was created based on the research findings and best practices which were discussed in the preceding literature review. This guide served as a template for the instructors as they converted their existing content into a recorded lecture that was placed online for their students. Built into the guide template the instructors also found recommendations for activities or actions that the students needed to accomplish while viewing the online lecture. Between using the lecture template and embedding the student requirements into the lecture it was believed that the engagement level of the students would be increased, thus making the lecture more effective for student learning. Support was provided to the instructors through small-group workshops and one-on-one assistance by this researcher (the principal investigator) primarily to address technical issues with the software required to record their lectures as well as to provide instruction concerning the guide/template.

Data were collected from the students and the participating instructors after each lecture was used. The students completed a short survey gathering data regarding their experience with the lecture and the instructors completed a similar survey. Descriptive

statistics were generated from each survey as well as log files from the university's CMS, and these reports were made available to the instructors prior to discussion in small focus groups. Measuring learning is a very difficult thing to do, so this study attempted to measure student engagement and satisfaction through the survey results, log file summaries, and the instructor's perceptions, as well as the student's perception of their learning via the online lectures. Adding to that, the instructors were able to provide anecdotal evidence of student achievement as well as their own satisfaction with the results of the online lecture. The purpose of these focus groups was to identify the design and pedagogical elements that were successful with engaging the students and the elements that needed improvement. Modifications were made to the "Bese Guide for Online Lecture Development" based on these focus groups for implementation in Phase Two. The participating students were then asked to complete the survey after each of the lectures during the implementation phases. Individual data was anonymous, but it was linked to the course in which the lecture was used, allowing the data to be aggregated at the course or section level.

In Cycle II, lectures were developed based on the revised guide/template followed by the same data gathering, descriptive statistics analysis, and focus groups which determined any additional modifications to the guide. The process was refined as the principle investigator continued to work with the faculty. After this second iteration the guide was considered complete and the results of the study were disseminated.

Timeline

This implementation of this study and data gathering phase took place during an eight-week portion of the term. The first three weeks allowed the instructors to make their

first lecture using the Bese Guide and activities, followed by the student survey. To keep the "instructional unit" consistent for each phase, the instructors presented the same amount of content that they would normally present in one week, even if this necessitated breaking it into multiple smaller sections to follow the guidelines of the template. At this point the data comparison between the entire student response and each individual instructor was aggregated and privately disseminated to him or her. After each instructor received his or her individual data, the collective group of instructors met the following week as a focus group led by the principal investigator to discuss the results and changes for the next cycle. The focus group meeting was recorded for documentation and for review during the final analysis. The last five weeks allowed for the development of the second online lecture with the modifications, followed by the student survey once again. The final data was shared with the instructors who then met for one last focus group to discuss the results and make final modifications to the template.

The Participants & Setting

A large number of the full-time and adjunct professors at Mid-State University have recently completed a general orientation of the technology and pedagogical practices used in Blended and Online teaching. From this list of completed faculty an invitation was sent offering the opportunity to participate in this study. The offer of personal assistance to develop their online lectures was sufficient motivation to participate, although the offer to co-author and co-present the findings of this research was also presented to each participating instructor. Knowing that student participation would be harder to get, it was be advertised to the students that each time they completed the survey after a lecture there would be a drawing for a prize (a VISA gift card). The majority of the participating

instructors were from the Degree Completion Program along with one instructor from the Graduate Education Program.

The Bese Guide for Online Lecture Development Template

1. Introduce yourself if this is the first lecture for the class (visual – picture or video) (1 min) *(Gain their attention)*
2. Provide an overview of the goal of the lecture and clarify the student's responsibilities (are they to take notes, complete an advance organizer, have a live chat with another student during the lecture or other requirements) (1-2 min) *(describe the goal & make connections to prior knowledge)*
3. Prepare visuals to accompany the lecture (possibly PowerPoint, graphics, animations or video clips)
4. Use only 3-5 main points and chunk content into 10-15 minute sections, "Focus on your message", "Speak to your audience" (do not read from a script or PowerPoint slide), "Be animated" (include pauses, repetition, vary your pitch) *(present the material to be learned)*
5. After each section have the students pause to participate in some activity (see the list in Appendix A: possibly use a method of keeping students active during the lecture through a type of response system or note taking) *(provide guidance for learning)*
6. Continue with content in 10-15 min blocks with some student activity after each section (or create individual 10-15 minute presentations).
7. In conclusion, pose a question or two for the students to determine their comprehension or need to review sections for a second time and wrap up with

information for what will happen next (either in class for blended courses or what to do online for fully online courses).

8. Make sure to have some type of activity where you can *provide feedback* (perhaps a forum), *assess their progress and insure retention*.

(Blanco, 2008; Clark, 2008; Cunniff et al., 2005; Gagne, 1970; Revell & Wainwright, 2009; Scherokman & Waechter, n.d.; Wilson & Korn, 2007)

Activities to use with online lectures (especially between "chunks" if longer than 15 minutes)

1. "Think-Pair-Share" – have the students pair up with a partner who will agree to view the lecture at the same time. Have the students use a chat or VOIP program like Skype or Google Hangout so that they can discuss the lecture while or after they view it. Text messages on most phones could also be used.
2. "One Minute Essay" – at periodic intervals during the lecture, have the students pause and record their thoughts or responses to a prompt in a discussion forum or journal.
3. Have the students take notes while viewing the lecture and upload a copy of their notes to the instructor through the CMS.
4. Provide an advance organizer prior to viewing the lecture. Have the students complete the organizer while viewing the lecture. This could be a document that they print out to use or a digital document or web application that they complete on the computer.

Although not included in this study, the Instructional Designer working with the participating faculty will provide suggestions and strategies for the effective use of the additional class time, which would normally be spent on the lecture that is being put online.

Table 2

Elements and Activities of the Template with Supporting Sources

Elements of the Template	Supporting Sources
Introduce yourself if this is the first lecture for the class	(Gagne, 1970; Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008)
Provide an overview of the goal of the lecture and clarify the student's responsibilities	(Gagne, 1970; Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008)
Prepare visuals to accompany the lecture (possibly PowerPoint, graphics, animations or video clips)	(Gagne, 1970; Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008)
Use only 3-5 main points and chunk content into 10-15 minute sections	(Gagne, 1970; Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008; Revell & Wainwright, 2009)
After each section have the students pause to participate in some activity	(Gagne, 1970; Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008)
Continue with content in 10-15 min blocks with some student activity after each section (or create individual 10-15 minute presentations).	(Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008)
In conclusion, pose a question or two for the students to determine their comprehension or need to review sections for a second time and wrap up with information for what will happen next	(Gagne, 1970; Cunniff et al., 2005; Scherokman & Waechter, n.d.; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008)
Make sure to have some type of activity where you can *provide feedback* (perhaps a forum).	(Gagne, 1970; Cunniff et al., 2005; Blanco, 2008; Wilson & Korn, 2007; Clark, 2008; Revell & Wainwright, 2009)

(continued)

Activities to accompany the template	Supporting Sources
Think-Pair-Share	Cunniff et al., 2005; Slagter van Tryon & Bishop, 2009; Revell & Wainwright, 2009
One Minute Essay	Cunniff et al., 2005; Slagter van Tryon & Bishop, 2009; Revell & Wainwright, 2009
Take notes	Wilson & Korn, 2007; Scherokman & Waechter, n.d.
Provide Advance Organizer	Ausubel, 1963; Cunniff et al., 2005; Scherokman & Waechter, n.d.

Student Survey

In order to gather relevant data, the student survey was developed around the themes of engagement/enjoyment and perceived learning/remembering. The questions were designed to be answered with a simple yes or a no (see Appendix A). Students were to choose yes, if the statement corresponded with their personal experience, and no, if it did not. They were also instructed to skip any question that they felt was not applicable to their experience. Demographics were collected for the participants based on their age and year of college, their degree program, and their use of online video and social media. Disaggregation of the data was assessed for the demographic data in order to determine if the results were significantly different for different subgroups.

The survey was given to the students after the following class session. (For example: if class was held on Wednesdays, then the students would be asked to view the lecture between the first Wednesday and the second Wednesday. The link to the survey was sent out after class the following day, Thursday in this case). This timeframe was chosen to allow students enough time to review lectures, complete activities accompanying the lectures, and talk to other students about the lectures, while still being fresh enough in their minds to provide accurate feedback on the survey.

The survey has been tested for usability by a group of students who will not participated in the actual study. The usability test included a feedback area every five questions to allow the students to describe any item that was unclear. After the student responses were combined, two questions showed a propensity to be misunderstood and were modified. The questions that were modified were changed from a negative statement to a positive statement (i.e. "I did not experience technical difficulties" was changed to "I experienced technical difficulties").

Topics for Faculty Focus Groups

The data from the student survey were compiled for the faculty focus groups. It was aggregated at the section level, course level, and overall for all participants. The instructors had their copy of the data prior to meeting as a focus group. The questions for the faculty were:

1. Based on your data and experience what were the highest areas of student engagement and satisfaction?
2. What were the lowest?
3. What can be done to further improve student engagement and satisfaction?
4. From your point of view, were your video lectures successful?
5. What do you think would make them more successful?

Following each cycle of the project, the faculty focus groups reviewed the data, discussed the topics listed above, and made the revisions to the current template for both design and pedagogical practices.

Data Analysis

The student survey contained mostly yes or no questions with a few multiple choice selections for demographics and one open-ended question at the end. The results of the student survey were examined as a simple frequency distribution which was also represented as a percentage for all of the multiple selection and binary responses. The faculty focus group then based their discussion on these data along with their personal experience as experienced professional educators.

The open-ended responses required coding. Coding is a process applied to narrative responses to generate a description of categories or themes for analysis (Creswell, 2003). The process of coding the one open-ended response was derived from Creswell's description of Tesch (1990). The first step to developing the emergent topics from the student responses was to read through all of the comments to get a "sense of the whole" while jotting down ideas as they came to mind. After completing this task, the entire set of narrative responses was read again with tally marks beside each topic. At this point the list of topics was clustered together into common themes with several "leftovers". The most accurate description of each theme was finalized and then the responses were read one more time to make sure that the original comment fit well within the theme. The entire coding process took place with the principal researcher and an educational colleague to ensure validity. At this point the final tallies were turned into percentages in terms of the total number of student responses to aid in the faculty focus group's discussion and analysis of the data.

Chapter 4: Results

The purpose of this study was to improve the use of online lectures in higher education by focusing of the development of the lectures and pedagogical practices connected to the use of the lectures. The researcher worked with a small group of instructors to develop and implement their online lectures in blended or online courses. The study used a template/guide, developed from research on lecture development and pedagogical practice as a starting point. Instructors developed their lectures based on the template, including suggested student activities, and improvements were made for the second iteration through modifications to the template and the student activities.

The methodology was based on action research principles. There were two complete cycles of development, implementation, data collection, analysis, and modification. Data was collected through an online survey from the students who viewed the online lectures, as well as from the participating faculty through focus group debriefing meetings. The same student survey was used for each cycle and was piloted for usability in the previous term. Analysis of the student and faculty data led to the modification of the template for design as well as the student activities connected to the lecture. The modifications were then finalized for each round through email communication along with encouragement to the participants for the next cycle.

Implementation

To begin this research study, an invitation was sent out to approximately 50 instructors who were identified as teaching a blended or fully online course during the current term. Of the invited instructors, ten responded with interest and were sent a detailed description of the study and their responsibilities should they choose to

participate. Of those ten instructors, six decided to participate. The principal investigator met with each of these instructors individually to explain the template to be used for the development of their online lectures, including the range of possible student activities to supplement the lecture. During this meeting technical issues related to the development of the online lectures were also addressed and several resources were suggested and explained. The majority of the instructors decided to use an online service called BrainShark.com to put narrated PowerPoint lectures into their courses while a couple of the instructors chose to use screen capture software that they were familiar with to record their lectures for use online.

The Bese Guide for Online Lecture Development Template

The initial template/guide that was given to the instructors was as follows:

9. Introduce yourself if this is the first lecture for the class (visual – picture or video) (1 min) *(Gain their attention)*
10. Provide an overview of the goal of the lecture and clarify the student's responsibilities (are they to take notes, complete an advance organizer, have a live chat with another student during the lecture or other requirements) (1-2 min) *(describe the goal & make connections to prior knowledge)*
11. Prepare visuals to accompany the lecture (possibly PowerPoint, graphics, animations or video clips)
12. Use only 3-5 main points and chunk content into 10-15 minute sections, "Focus on your message", "Speak to your audience" (do not read from a script or PowerPoint slide), "Be animated" (include pauses, repetition, vary your pitch) *(present the material to be learned)*

13. After each section have the students pause to participate in some activity (see the list below: possibly use a method of keeping students active during the lecture through a type of response system or note taking) *(provide guidance for learning)*
14. Continue with content in 10-15 min blocks with some student activity after each section (or create individual 10-15 minute presentations).
15. In conclusion, pose a question or two for the students to determine their comprehension or need to review sections for a second time and wrap up with information for what will happen next (either in class for blended courses or what to do online for fully online courses).
16. Make sure to have some type of activity where you can *provide feedback* (See list below), *assess their progress and insure retention*.

Activities to use with online lectures (especially between "chunks" if longer than 15 minutes)

5. "Think-Pair-Share" – have the students pair up with a partner who will agree to view the lecture at the same time. Have the students use a chat or VOIP program like Skype or Google Hangout so that they can discuss the lecture while or after they view it. Text messages on most phones could also be used.
6. "One Minute Essay" – at periodic intervals during the lecture, have the students pause and record their thoughts or responses to a prompt in a discussion forum or journal.
7. Have the students take notes while viewing the lecture and upload a copy of their notes to the instructor through the CMS.

8. Provide an advance organizer prior to viewing the lecture. Have the students complete the organizer while viewing the lecture. This could be a document that they print out to use or a digital document or web application that they complete on the computer.

Cycle I

Five of the six instructors actually followed through, developed their lectures and presented them to their students through the course management system. Using the principles of TPACK, each instructor was given the freedom to use whichever student activity or technology that they felt was best suited for their course and desired student outcomes. Four of the five teachers chose to use a version of the "One Minute Essay" or note taking, where the students were asked to upload their response or notes to a forum or assignment in the CMS. The fifth teacher chose to have the students turn in a Word document demonstrating how they had practiced the content from the lecture. This first iteration took place over a three-week span when their students were asked to view the online lecture, complete the accompanying activity and then provide feedback from their experience through the survey developed for this study. The lecture and student activity was required to be completed in about a week for each teacher, but the timing was slightly different for each course. The lectures and student activities were all placed in Moodle (the CMS for the university). The video lectures were all embedded in Moodle pages in order to prevent confusion for the students.

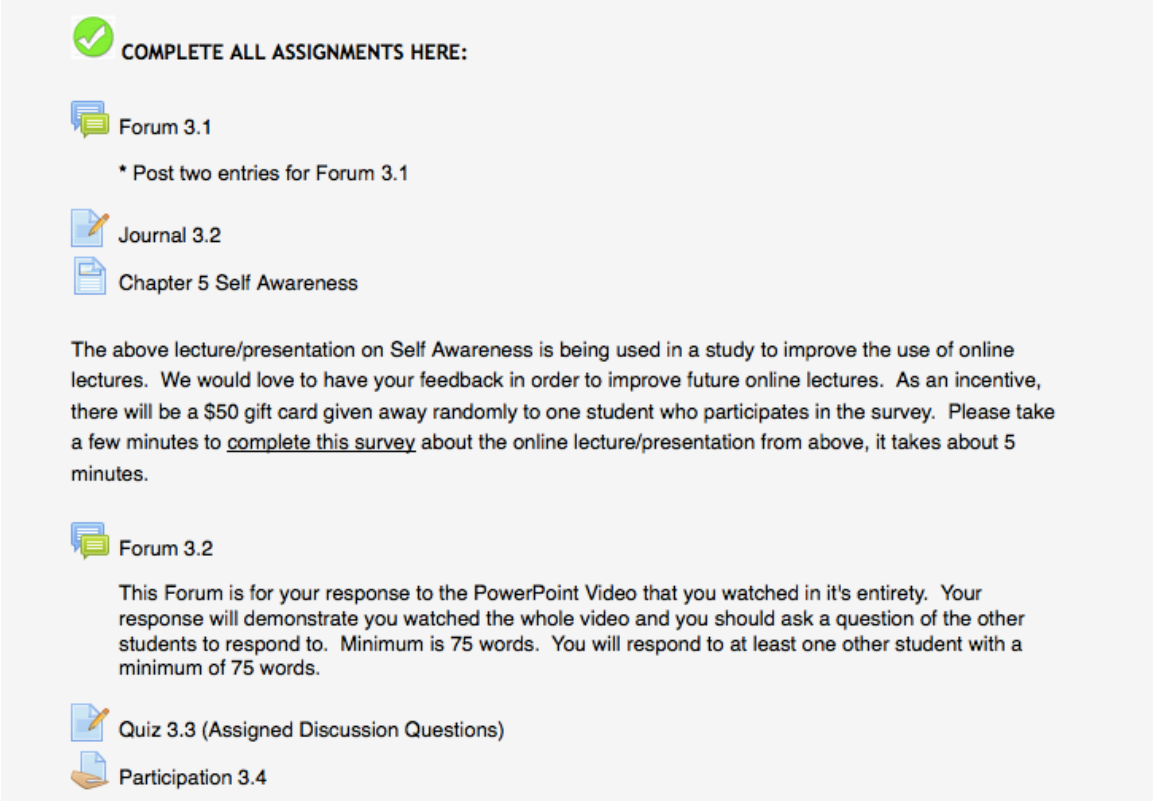

Figure 3. Example from CMS for cycle I

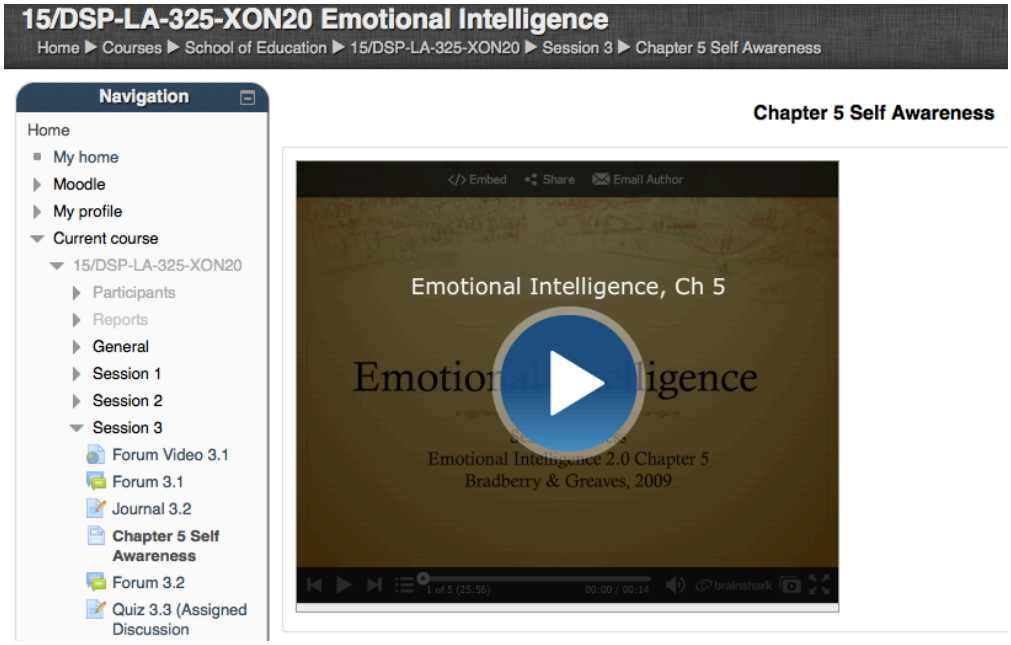

Figure 4. Example from CMS for cycle I

A random drawing for a $50 gift card for students participating in the survey was used as incentive to increase the student responses. The total number of completed student surveys in this first round was 58 for a completion rate of 71%. The aggregated results of the student survey are as follows:

Demographics. The student's major area of study break down was: Early Childhood Development – 19 (35%); Liberal Arts – 19 (35%); Business – 9 (16%); Mathematics – 5 (9%); Nursing – 1 (<2%); MFT Counseling – 1 (<2%); and Criminology – 1 (<2%).

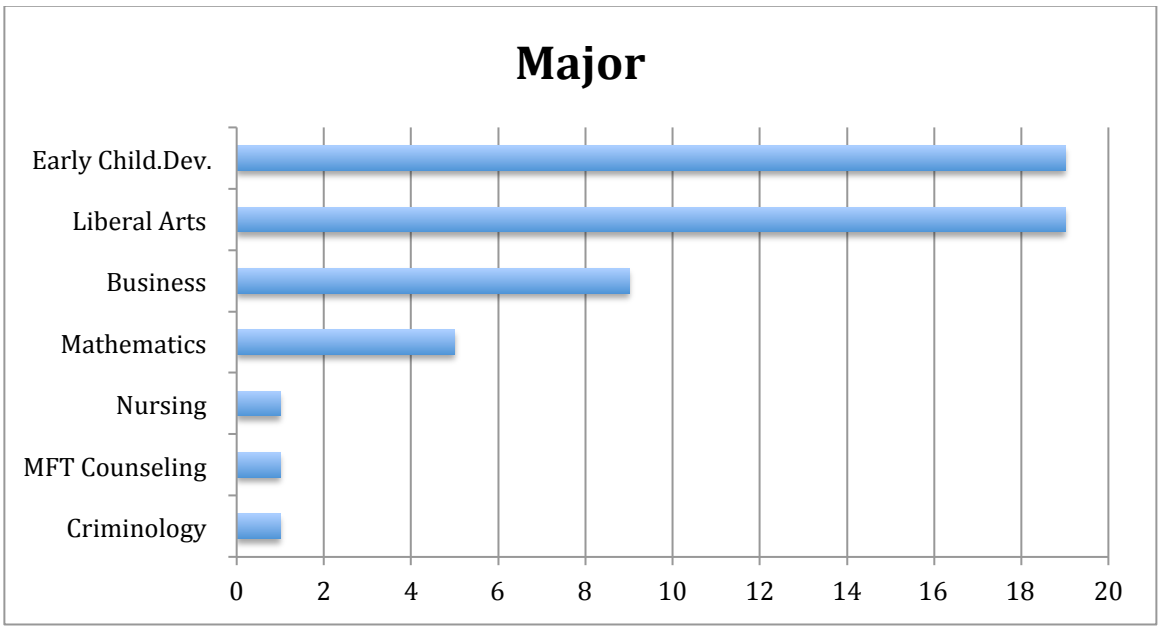

Figure 5. Distribution of majors for cycle I

The number of years of college reported was: More than four – 26 (46%); Four – 15 (26%); Three – 11 (19%); One – 3 (5%); and Two – 2 (3%). Due to the fact that many of the Degree Completion and Graduate Education courses are blended or online, it makes sense that a lot of the students were older and had more college experience.

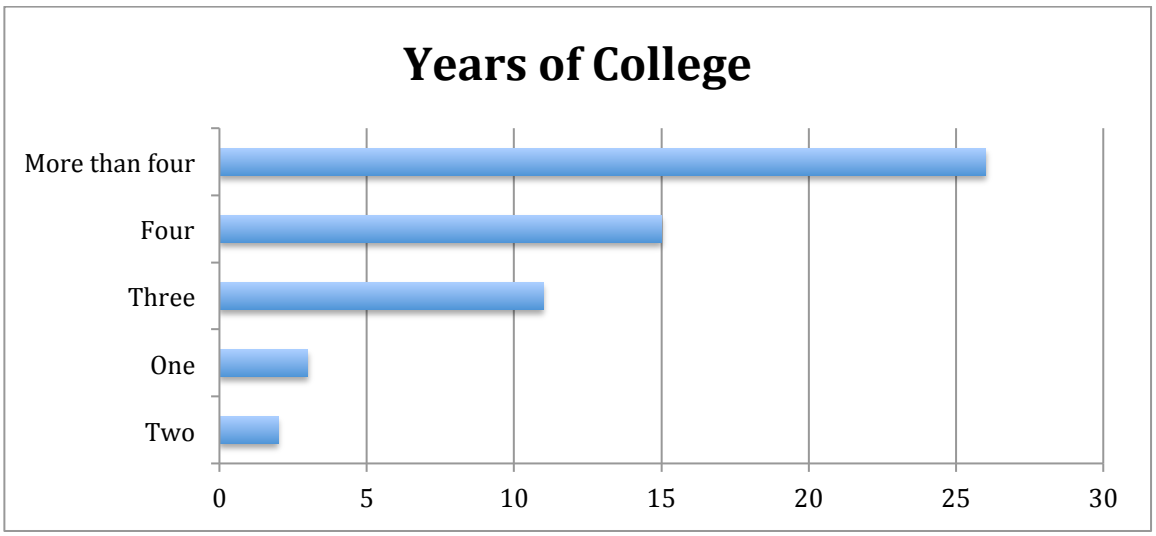

Figure 6. Distribution of years of college for cycle I

Eighty-three percent claimed to watch many online videos such as YouTube and Vimeo (Yes – 48, No – 10). About the same number, eighty-one percent of the students claimed to use social media websites like Facebook and Twitter (Yes – 47, No – 11).

The age distribution for the students in cycle 1 was as follows:

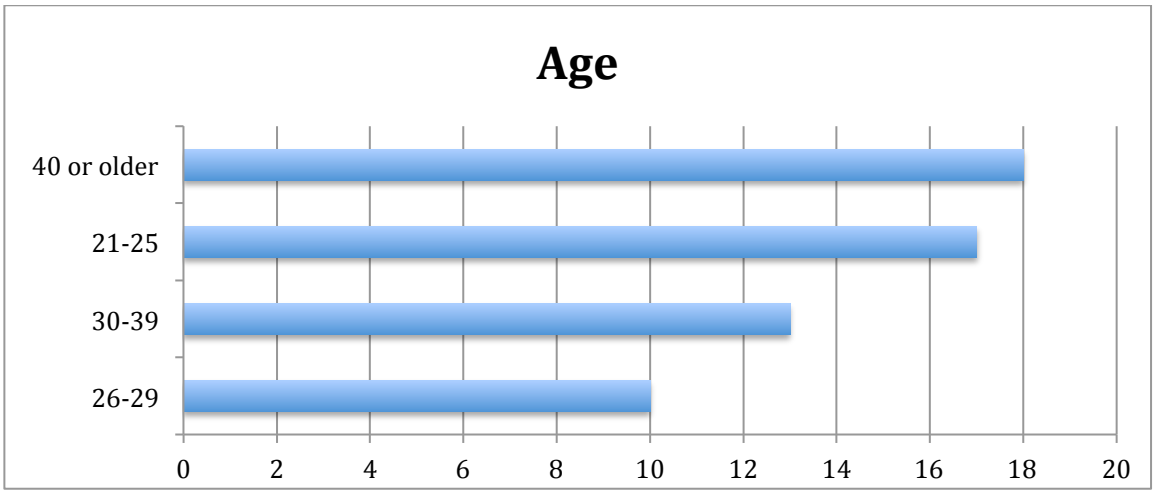

Figure 7. Distribution of age for cycle I

(Note: the 20's were divided on the survey because it was believed that most college students would be in their 20's. Had the two categories been combined, the 20's would make up 64% of the respondents).

Viewing behavior. Seventy-nine percent of the students said that they watched the online lecture straight through (Yes – 46, No – 12), and sixty-seven claimed to have paused and replayed sections (Yes – 39, No – 19). While at first that might seem to be contrary data, further follow-up with several students suggested that they understood "straight through" as "in one sitting", so replaying sections during that one sitting is very plausible. Along the same lines, forty percent said that they viewed the lecture at multiple times (Yes – 23, No – 35), so of the seventy-nine percent that said they watched it straight through, that apparently was not the only time that they viewed the lecture.

Eighty-four percent of the students said that they did the activities associated with the videos (Yes – 47, No – 9). In most of the courses the activity included a grade, which helped motivate students to complete it, but in some of the courses it did not have a grade because the original syllabus did not include it as a graded item.

Other behaviors reported by the viewing students included fifty percent who talked about the videos outside of class (Yes – 29, No – 29), and nine percent that fast-forwarded over the parts that they thought they already knew (Yes – 5, No – 53). Seventy-nine percent said they took notes when they watched, even when it was not required by most of the teachers (Yes – 46, No – 12). To wrap up the viewing behavior, two students (3%) downloaded the videos lectures onto mobile devices (Yes – 2, No – 56).

Viewing context. While only seven percent of the students actually watched with others (Yes – 4, No -54), almost half (48%) said that they prefer having their fellow students around them when they are trying to learn from lectures (Yes – 28, No – 30). In contrast to what we have been hearing from the annual Horizon Report, only twenty-one percent viewed the lecture on a mobile device (Yes – 12, No – 46), and two of the courses

that were participating in the study include iPads with digital books for all of their students and courses. Although it is maybe more of a purpose than a context, seventy-nine percent said that they watched the online lectures to review (Yes – 44, No – 12).

Viewing experience. A substantial majority (88%) of the students enjoyed the video lecture experience (Yes – 50, No – 7). On the flip side, the same number who did not enjoy the online lecture experience (seven students) said that they felt alone and cut off while viewing the lecture outside of class (Yes – 7, No – 49). Also, seven students (12%) experienced technical problems trying to view the lecture (Yes – 7, No – 50).
Only seventeen percent of the responding students said that they found it hard to see or hear the lecture (Yes – 10, No – 48), whereas sixty-one percent claimed that it is easier to see and hear this way than in a large classroom/lecture hall (Yes – 34, No – 22). Sixty-three percent of the students replied that it was clear what to do when they didn't understand something in the lecture (Yes – 35, No – 21).

Viewers' opinions. Fifty-eight percent said that they think that they are doing better in this class than they would have without the video lectures (Yes – 33, No – 24). Seventy-nine percent claimed that they wished their other classes would use video lectures (Yes – 45, No – 12) and sixty-seven percent felt like the time in class was better spent now that the lectures were online (Yes – 37, No – 18). A survey high ninety-one percent said that they felt like they understood better when they could review the lectures, along with ninety-one percent who claimed that they could ask better questions or participate better in class after watching the video beforehand (Yes – 52, No – 5).

Eighty-eight percent claimed to understand how the video lectures are supposed to be used for this class (Yes – 50, No – 7) and only seven students (12%) said that they could

not tell if they were getting it (meaning understanding) in this format (Yes – 7, No – 50). Similarly, only sixteen percent of the responding students thought that it was harder to understand in this format (Yes – 9, No – 48).

Twelve percent felt that the length of the lecture was too long (Yes – 7, No – 51) and only one student (2%) felt that it was too short (Yes – 1, No – 57). The first round lectures ranged between 13 minutes and 40 minutes, with the average duration of 23 minutes. There were twenty-two percent who wanted to be able to download the lecture onto a mobile device but they were not able to (Yes – 13, No – 45). The three lectures that were housed on BrainShark.com were only able to be played on the Moodle page, but the two screen captured videos could be downloaded with a small degree of technical expertise.

The final question was an open-ended response where students could write as much as they wished to answer the question, "What do you think could be changed to improve the use of online lectures for you?" The open-ended responses were coded into 17 topics on the first pass, and collapsed into 6 final themes based on the description of coding from chapter three. The six areas for improvement were: No change or N/A – 21 (41%); Quality of visuals – 9 (16%); Technical issues – 6 (10%); Quality of presenter – 5 (9%); Printout/Advance organizer – 5 (9%); Immediate student engagement – 3 (5%).

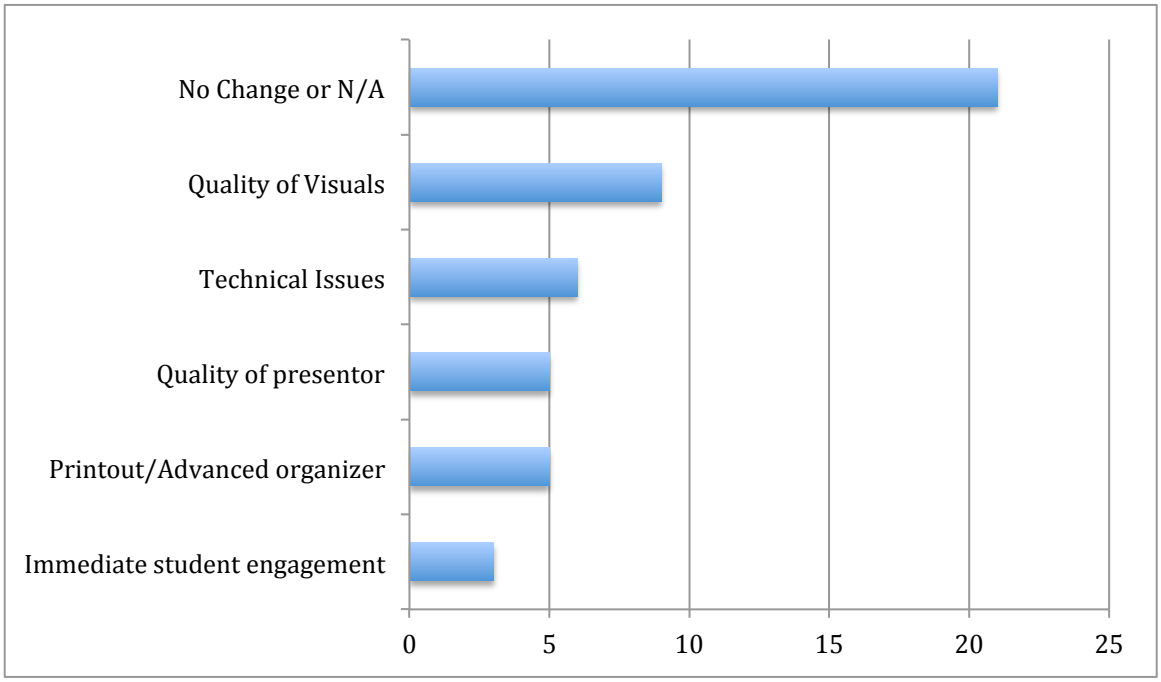

Figure 8. Coding results for cycle I

Cycle I faculty focus group. The faculty focus group took place in a virtual web meeting (Adobe Connect). Prior to the meeting, each instructor had been provided with a disaggregated summary of their student's data as well as a summary of the aggregation of all of the student data. The discussion first focused on what the instructors felt was generally positive feedback from the students, especially the overwhelming majority who said, "I wish my other classes would use video lectures"; "I feel like the time in class is better spent now that the lectures are online"; "I feel like I am understanding better when I can review the lectures"; and "I think that I am doing better in this class than I would have without the video lectures." The focus group then took notice of the nearly 40% of students who said that they were not sure what to do when they didn't understand something in the lecture and the nearly 50% who said that they prefer having their fellow students around during the lecture. After considering the open ended comments asking for more immediate ways for the students to engage during the lecture, the focus group came

to the decision that instead of notes or forum postings they should design student activities that provided more immediate engagement. The consensus of the faculty to strive for more immediate student engagement led them to change their student activities for round two.

Unanticipated findings – Cycle I. During the first faculty focus group, several of the instructors mentioned that they missed the interaction and ability to "connect" with the students. A short while later, one of the instructors suggested that we eliminate all of the student comments that dealt with technical issues and concentrate on the comments that related to the students' ability to actually engage with the content of the lecture. One particular student statement that came to the surface was: "Being able to bounce ideas between other students helps me see things from the perspective of others and opens my eyes to alternative views that I would otherwise not have seen."; followed by: "I prefer to have a small lecture in class so that I can ask my instructor any questions I have."; as well as: "Also it would be nice to have a document to go along with the video so that we can print it off and follow along." Although not high in volume, comments like these fuelled the faculty's notion that a certain level of engagement was missing, engagement between the student and the instructor as well as engagement between students. This notion was supported by the research on social presence cited in chapter 2 (pp. 18, 22, 27-30). For these reasons the participating instructors were spurred on to make adjustments in the template for Cycle II that focused mainly on improving the level of engagement.

Changes to the template after Cycle I. Looking at each of the themes from the write-in student comments, the focus group decided that the "quality of visuals" would be improved through practice and experience. The "quality of the presenter" would also improve through experience. The "advance organizer" idea was originally in the

template/guide but just had not been used by any of the teachers yet. The "technical issues" would most likely work themselves out over time as well, but a renewed commitment to using high quality equipment during the development of the next online lecture was also discussed.

Table 3

Changes to be Made After Cycle I

Changes to be made after Cycle I	Student data	Focus Group data
Hit pause and send a text message to the instructor with questions or comments during the lecture. (A reply will not be expected from the teacher until the following class session).	Question 17: I felt alone and cut off when viewing the lectures outside the class setting. (Only 13% said yes but this should address the issue). Also, two student comments asked for the ability to ask questions.	One focus group member added that if text messages were sent to an email address they would be archived until the instructor could deal with them (instead of ringing on the phone each time).
Record a voice memo of the immediate reaction to each section of the lecture, upload to the CMS or send as a message to the instructor.	In addition to Question 17, there were three student comments relating to a desire to discuss the content.	One instructor in the focus group thought that this would not only help with student engagement, but would allow their emotions to come through (excitement, confusion, wonder, etc.)
Print out the PPT notes page and fill in with notes and thoughts during the lecture, upload to the CMS.	Three student comments asked for the ability to print the lecture to take notes on, several more comments asked for the ability to download it.	The focus group reiterated that this was on the original template but was not implemented as of yet.
Hit pause and flip between the lecture and Word (or other application) to practice the topics from the lecture, upload the document to the CMS.	Questions 27 & 33. Additional student comments for the desire to have "hands-on" experiences to match the skills explained in the lecture.	Some of the focus group shared that when they are teaching a skill or software application they often have students try it out right after they talk about it.

(continued)

Changes to be made after Cycle I	Student data	Focus Group data
Take a CMS based quiz giving immediate feedback to the student so they know if they need to go over it again.	Question 27. Only 12% said they couldn't tell if they were getting it, but teachers often give a short quiz as part of their formative assessment.	The focus group emphasized that a short multiple choice quiz could be scored automatically in the CMS, giving students immediate feedback.
Use professional microphone.	Seven student comments regarding audio/voice quality.	One focus group member knew that the Center for Online Learning office has several microphones available for checkout.

Cycle II

The second iteration was spread over the next five weeks, with some instructors wanting to develop their recorded lectures right away and some needing to wait until the right time for the class. The Template/Guide for developing the online lectures for Cycle II looked like this:

1. Introduce yourself if this is the first lecture for the class (visual – picture or video) (1 min) *(Gain their attention)*
2. Provide an overview of the goal of the lecture and clarify the student's responsibilities (are they to take notes, complete an advance organizer, have a live chat with another student during the lecture or other requirements) (1-2 min) *(describe the goal & make connections to prior knowledge)*
3. Prepare visuals to accompany the lecture (possibly PowerPoint, graphics, animations or video clips)
4. Use only 3-5 main points and chunk content into 10-15 minute sections, "Focus on your message", "Speak to your audience" (do not read from a script or PowerPoint

slide), “Be animated” (include pauses, repetition, vary your pitch, use high quality microphone) *(present the material to be learned)*

5. After each section have the students pause to participate in some activity (see the list below: possibly use a method of keeping students active during the lecture through a type of response system or note taking) *(provide guidance for learning)*
6. Continue with content in 10-15 min blocks with some student activity after each section (or create individual 10-15 minute presentations).
7. In conclusion, pose a question or two for the students to determine their comprehension or need to review sections for a second time and wrap up with information for what will happen next (either in class for blended courses or what to do online for fully online courses).
8. Make sure to have some type of activity where you can *provide feedback* (See list below), *assess their progress and insure retention*.

The list of suggested activities to use with online lectures:

1. “Think-Pair-Share” – have the students pair up with a partner who will agree to view the lecture at the same time. Have the students use a chat or VOIP program like Skype or Google Hangout so that they can discuss the lecture while they view it. Even text messages on most phones could be used to share at the time of viewing the lecture. Recorded audio or text transcripts could even be turned in.
2. “One Minute Essay” – at periodic intervals during the lecture, have the students pause and record their thoughts or responses to a prompt in a discussion forum or journal.

3. Have the students take notes while viewing the lecture and upload a copy of their notes to the instructor through the CMS.
4. Provide an advance organizer prior to viewing the lecture. Have the students complete the organizer while viewing the lecture. This could be to print out the PPT "handouts" page and fill in with notes and thoughts during the lecture, upload to the CMS.
5. Have the students send text messages as they view the lecture with questions and comments to the instructor to be discussed in the following class session.
6. Record a voice memo of the immediate reaction to each section of the lecture, upload to the CMS or send as a message to the instructor.
7. Hit pause and flip between the lecture and Word (or other application) to practice the topics from the lecture, upload the document to the CMS.
8. Take a CMS based quiz giving immediate feedback to the student so they know if they need to go over it again.

The student activities that were changed or added to strive for more immediate student engagement are bullet points four through eight.

One of the instructors also changed to a professional quality microphone to assist in the development of the second lecture to improve the audio quality.

The lectures were developed and made available to the students and the survey was requested for the second time.

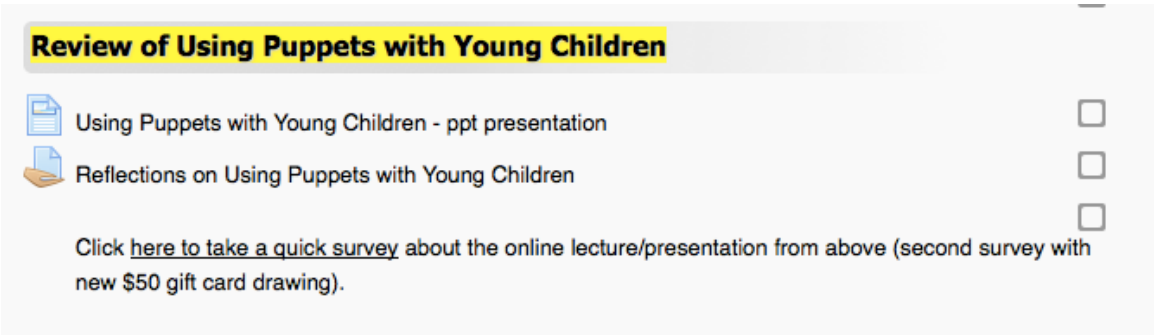

Figure 9. Example from CMS for cycle II

Figure 10. Example from CMS for cycle II

Demographics. The total number of completed student surveys in the second iteration was 37 for a completion rate of 45% (considerably lower than Cycle I). The respondent's major area of study was: Early Childhood Development – 21 (57%); Mathematics – 11 (30%); Nursing – 2 (5%); Liberal Arts – 1 (3%); Business – 1 (3%).

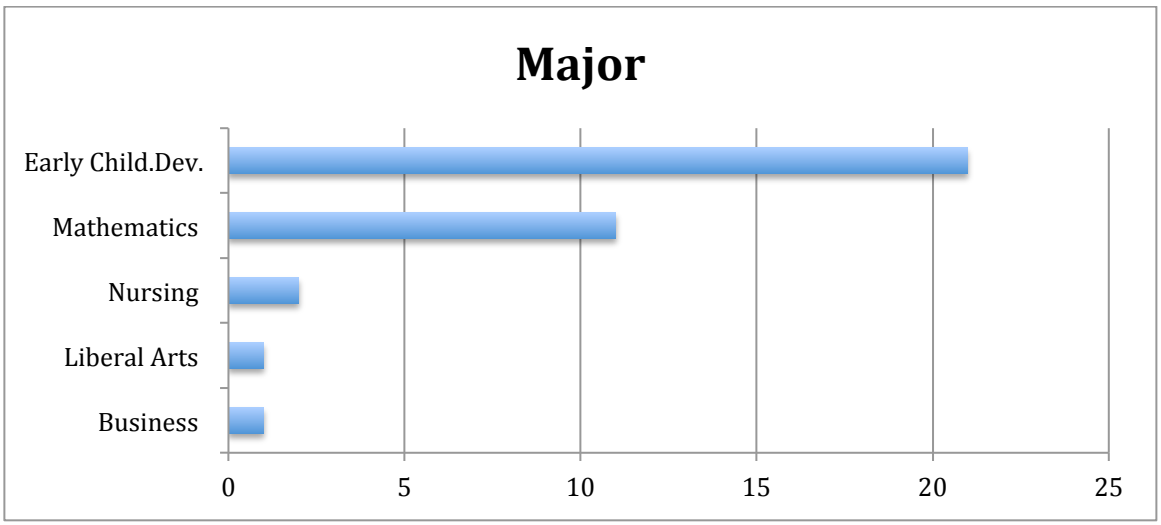

Figure 11. Distribution of majors for cycle II

The number of years of college reported by the students was: More than four – 25 (68%); Four – 8 (22%); Two – 2 (5%); One – 2 (5%).

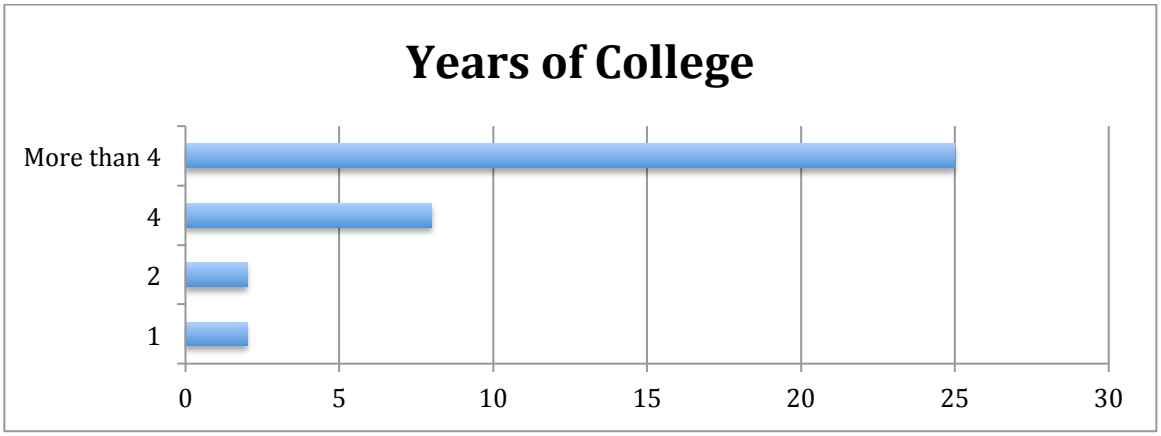

Figure 12. Distribution of years of college for cycle II

Seventy-six percent claimed to watch many online videos such as YouTube and Vimeo (Yes – 28, No – 9). About the same number, eighty-four percent of the students claimed to use social media websites like Facebook and Twitter (Yes – 31, No – 6).

The age distribution for Cycle II was: 21-25 – 18 (41%); 40 or older – 11 (30%); 30-39 – 8 (22%); 26-29 – 3 (8%).

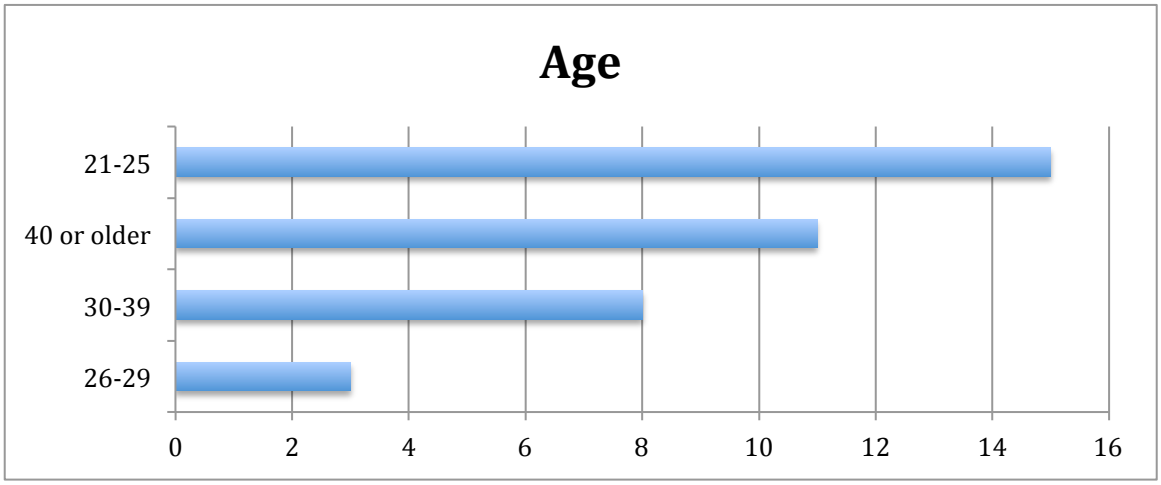

Figure 13. Distribution of age for cycle II

Viewing behavior. Eighty-six percent of the students said that they watched the online lecture straight through (Yes – 31, No – 5), and seventy-seven claimed to have paused and replayed sections (Yes – 27, No – 8). Along the same lines, forty-two percent said that they viewed the lecture at multiple times (Yes – 15, No – 21), so of the eighty-six percent that said they watched it straight through, it was not the only time that they viewed the lecture.

Eighty-nine percent of the students said that they did the activities associated with the videos (Yes – 32, No – 4). As in Cycle I, in most of the courses the activity included a grade, which helped motivate students to complete it, but in some of the courses it did not have a grade because the original syllabus did not include it as a graded item.

Other behaviors reported by the viewing students included forty-six percent who talked about the videos outside of class (Yes – 17, No – 20), and fourteen percent that fast-forwarded over the parts that they thought they already knew (Yes – 5, No – 32). Sixty-nine percent said they took notes when they watched, even when it was not required by

most of the teachers (Yes – 25, No – 11). In Cycle II, only one student (3%) downloaded the videos lectures onto mobile devices (Yes – 1, No – 36).

Viewing context. Only two students actually watched with others (Yes – 2, No -35), and during the faculty focus group one of the instructors mentioned that he had a married couple in class together so most likely they were the two who did. Sixty-five percent said that they prefer having their fellow students around them when they are trying to learn from lectures (Yes – 24, No – 13). In contrast to what we have been hearing from the annual Horizon Report, only eight percent viewed the lecture on a mobile device (Yes – 3, No – 34), and two of the courses that were participating in the study include iPads with digital books for all of their students and courses. Although it is maybe more of a purpose than a context, fifty-six percent said that they watched the online lectures to review (Yes – 20, No – 16).

Viewing experience. A substantial majority (95%) of the students enjoyed the video lecture experience (Yes – 35, No – 2). On the flip side, about the same number who did not enjoy the online lecture experience said that they felt alone and cut off while viewing the lecture outside of class (Yes – 3, No – 34). Also, three students (8%) experienced technical problems trying to view the lecture (Yes – 3, No – 34).
Only five percent of the responding students said that they found it hard to see or hear the lecture in Cycle II (Yes – 2, No – 35) whereas sixty-eight percent claimed that it was easier to see and hear this way than in a large classroom/lecture hall (Yes – 25, No – 12). Sixty-nine percent of the students replied that it was clear what to do when they did not understand something in the lecture (Yes – 24, No – 11).

Viewers' opinions. Thirty-eight percent said that they think that they are doing better in this class than they would have without the video lectures (Yes – 14, No – 23); this was a twenty point drop from Cycle I, but could be due to the lower completion rate. Seventy-eight percent claimed that they wished their other classes would use video lectures (Yes – 28, No – 8) and sixty-five percent felt like the time in class was better spent now that the lectures are online (Yes – 22, No – 12). Ninety-one percent said that they felt like they understood better when they could review the lectures (Yes – 32, No – 3), along with eighty-eight percent who claimed that they could ask better questions or participate better in class after watching the video beforehand (Yes – 30, No – 4).

Ninety-seven percent claimed to understood how the video lectures are supposed to be used for this class (Yes – 36, No – 1), and only seven students (20%) said that they couldn't tell if they were getting it (meaning understanding) in this format (Yes – 7, No – 28). Similarly, only twenty-two percent of the responding students thought that it was harder to understand in this format (Yes – 8, No – 29).

Five percent felt like the length of the lecture was too long (Yes – 2, No – 35) and not one student felt like it was too short (Yes – 0, No – 37). The second round lectures ranged between 15 minutes and 32 minutes, with an average duration of 20 minutes. There were fourteen percent who wanted to be able to download the lecture onto a mobile device but they were not able to (Yes – 5, No – 31). The three lectures that were housed on BrainShark.com were only playable on the Moodle page, but the two screen captured videos were able to be downloaded with a small degree of technical expertise.

The final question was an open-ended response where students could write as much as they wished to answer the question, "What do you think could be changed to improve the

use of online lectures for you?" The open-ended responses were coded into 8 topics on the first pass and collapsed into 3 final themes based on the description of coding from chapter three (Data Analysis). The three areas for improvement were: No changes or N/A – 11 (30%); Technical issues – 7 (19%); Immediate student engagement – 6 (16%).

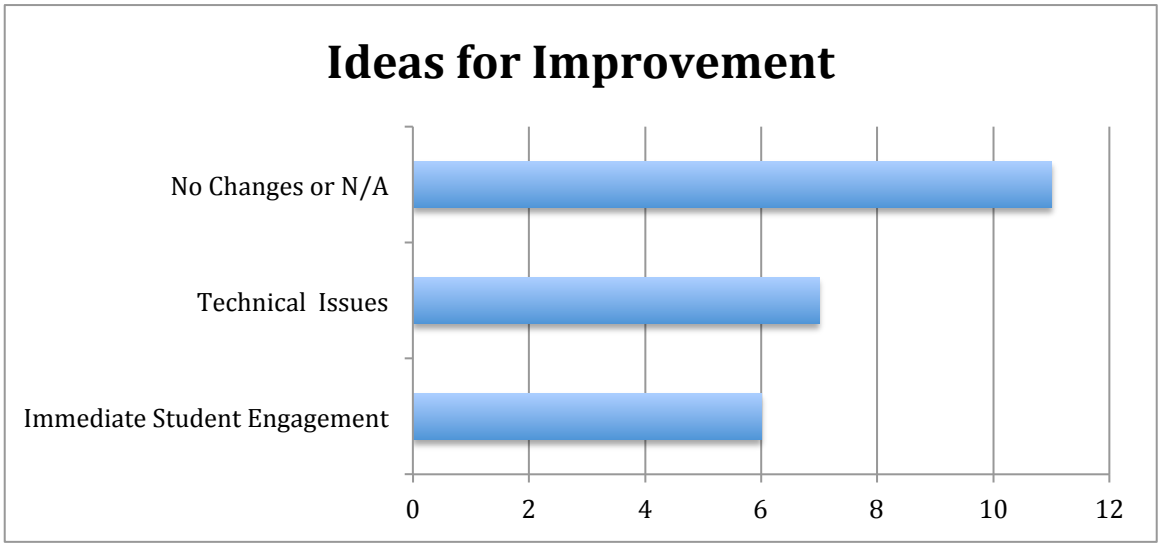

Figure 14. Coding results for cycle II

Cycle II faculty focus group. The final faculty focus group again took place in an Adobe Connect meeting room. Instructors had been given their student's survey responses along with a summary of all student responses. The predominate comments again were focused on how positive the whole experience was, including how much they thought their students liked the online lecture experience. Although fewer students thought they were doing better in the class than they would have without the videos (38% compared to 58% the first round), they still overwhelmingly enjoyed the lectures (95%) and wanted their other classes to use online lectures as well (78%). The focus group commented several times that they still needed to produce more online lectures before they could eliminate negative student comments concerning the visual quality and other technical issues, but

they felt as though the lectures were getting better and their own confidence was increasing. The greatest concern that they had from the student data was Question 34, where 65% of the students said that they still prefer having their fellow classmates around them when learning from a lecture. There were 24 students in the second round compared to 28 students the first round, but due to the lower response rate it was a higher percentage.

The focus group talked about how the "Think-Pair-Share" activity could possibly meet the students' need for engagement with other students, but that the coordination that would be required to make it work was beyond normal expectations of their students, and would probably never be used in the foreseeable future. There were mixed opinions for keeping it in the template/guide or deleting it; several who wanted to keep it said that the guide is meant to provide a range of possibilities for the development of online lectures and activities. However, in the end it was cut from the template to keep it from getting bloated with ideas that will not be used.

The focus group was intrigued that the student comments could be coded into only three themes (No Change, Technical Issues, & Immediate Student Engagement) and felt that of those themes only the Immediate Student Engagement required their consideration. At first it was unsettling to the faculty, because the main focus of their improvements from the first iteration to the second was to increase immediate student engagement during the lecture. One of the focus group members suggested that it was for precisely that reason that there were more comments about it; it was the focus of the second iteration and the students picked up on that and their comments reflected that.

(A side-by-side comparison of student data from Cycle I and Cycle II can be found in Appendix B).

Unanticipated findings – Cycle II. Even though the instructors' goal after Cycle I was to include student activities that involved more student engagement, not every student had the same experience. Where one activity would give the student an advance organizer to print out and complete during the lecture, that student might have wanted to be able to ask questions or engage in a discussion. Therefore there were still student responses after Cycle II where some of the students wanted more of the engagement activities that were being used by some of the other participating instructors. Student responses such as "I don't mind online lectures, but I do like it when you can engage with the instructors and ask questions" were actually more prevalent for the Cycle II survey than the Cycle I survey.

Changes after cycle II to the final version of the template. The focus group decided to make no additions to the template/guide at this time. They believed that the template itself has plenty of guidance for teachers to develop effective online lectures, but that the process of implementing it is one that takes some time and experience to master. The final version for *The Bese Guide for Online Lecture Development Template* looks like this:

1. Introduce yourself if this is the first lecture for the class (visual – picture or video) (1 min) *(Gain their attention)*
2. Provide an overview of the goal of the lecture and clarify the student's responsibilities (are they to take notes, complete an advance organizer, have a live chat with another student during the lecture or other requirements) (1-2 min) *(describe the goal & make connections to prior knowledge)*

3. Prepare visuals to accompany the lecture (possibly PowerPoint, graphics, animations or video clips)
4. Use only 3-5 main points and chunk content into 10-15 minute sections, "Focus on your message", "Speak to your audience" (do not read from a script or PowerPoint slide), "Be animated" (include pauses, repetition, vary your pitch, use high quality microphone) *(present the material to be learned)*
5. After each section have the students pause to participate in some activity (see the list below: possibly use a method of keeping students active during the lecture through a type of response system or note taking) *(provide guidance for learning)*
6. Continue with content in 10-15 min blocks with some student activity after each section (or create individual 10-15 minute presentations).
7. In conclusion, pose a question or two for the students to determine their comprehension or need to review sections for a second time and wrap up with information for what will happen next (either in class for blended courses or what to do online for fully online courses).
8. Make sure to have some type of activity where you can *provide feedback* (See list below), *assess their progress and insure retention*.

The final list of suggested activities to use with online lectures:

1. "One Minute Essay" – at periodic intervals during the lecture, have the students pause and record their thoughts or responses to a prompt in a discussion forum or journal.

2. Have the students take notes while viewing the lecture and upload a copy of their notes to the instructor through the CMS.
3. Provide an advance organizer prior to viewing the lecture. Have the students complete the organizer while viewing the lecture. This could be to print out the PPT "handouts" page and fill in with notes and thoughts during the lecture, upload to the CMS.
4. Have the students send text messages as they view the lecture with questions and comments to the instructor to be discussed in the following class session.
5. Record a voice memo of the immediate reaction to each section of the lecture, upload to the CMS or send as a message to the instructor.
6. Hit pause and flip between the lecture and Word (or other application) to practice the topics from the lecture, upload the document to the CMS.
7. Take a CMS based quiz giving immediate feedback to the student so they know if they need to go over it again.

Table 4

Changes to be Made After Cycle II

Changes to be made after Cycle II	Student data	Focus Group data
Delete the "Think-Pair-Share" activity.	N/A	Although the focus group liked the concept of this activity, they felt that it would not be used due to the complex coordination required to implement it properly.

Concluding Thoughts

Throughout the implementation of this study there were several unanticipated issues, which required flexibility and minor changes. One of those items was faculty availability and time. While it was possible for the researcher to find time to meet with each instructor individually, finding a time when all of the faculty could meet together for the focus group was much more difficult than anticipated. One minor adjustment that was made to accommodate the focus group meeting was that it was held online in a virtual meeting room called Adobe Connect because at the times when each instructor was available, they were not in the same city (or state, as one participant was called away for an ailing family member).

Another issue that was not anticipated was associated with the type of student activities that the instructors chose to use along with their lectures. There were five original choices in the template and each teacher was given the option to choose, ideally choosing the one that would meet their objectives and worked best with their content (following principles from TPACK). They instead chose the "low hanging fruit" for the first cycle; four of the five chose to have their students post a forum submission based on the online lecture. Because of that, there was no data to be gathered on the other types of student activities in Cycle I.

For this reason as well as the technical issues that were apparent in the visuals and audio, it became clear that there was a definite learning curve for the faculty. The learning curve encompassed following the elements of the template and the technical aspects of developing their online lectures. Even though the principal investigator worked with the instructors ahead of time to help them be familiar and comfortable with the technical

aspects, it still took practice to master the development of the presentation and narrate it for independent use online. The study covered two complete cycles, but one participating instructor mentioned that they probably will need to do at least one or two more online lectures before feeling confident in their abilities.

Chapter 5: Discussion

Revisiting the Problem and Research Purpose

The mental image of herding cats is often used to describe changing a practice that has evolved on its own without the benefit of planning and design. That is exactly where the practice of using online lectures was going at my small university prior to this study. The instructors who were using online lectures were mostly just recording everything that they normally said in a face-to-face course while clicking through their presentation, often creating long boring lectures that were not even being viewed by their students. Even the shorter, more interesting online lectures typically did not include activities to engage the students and the instructors just assumed that the students would pay attention to them in the same way that they did with face-to-face lectures. Without taking the time to study and improve the use of online lectures, the practice was on its way to becoming that proverbial herd of cats.

The purpose of this study was to improve the practice of using online lectures through a two-fold approach, using design criteria based on research and including engaging activities based on pedagogical best practices. Through two cycles of practice, analysis, and modification, the design template was fine-tuned and the student activities were modified to provide high student engagement and satisfaction.

Placing This Study Into the Larger Context

This study was developed to build on the research findings from many who came before, and to open a new door for further investigation. Building on the concept of developing successful online pedagogy (Pelz, 2010; Dede, 2004; Bawane & Spector, 2009) which was discussed on pages 21-24, this study provided a way for faculty "to think

differently about teaching and learning, learn a host of new technological skills and engage in ongoing faculty development for design and development of quality online instruction, and play the role of teacher, learner and technical support" (Fish & Wickersham, 2009, p. 283).

Elements of this study were also informed by research on social presence, which was discussed on pages 27-31 in chapter 2 (Kehrwald, 2008; Short et al., 1976). Specifically, the instructor's online presence due to the media used (i.e. recorded lecture) (Biocca et al., 2003; Hill et al., 2009; Kreijns et al., 2004) and social connectedness through the activity included with the lecture (Slagter van Tryon & Bishop, 2009).

Every factor of this study was framed with the ideas of Technological Pedagogical Content Knowledge (Mishra & Koehler, 2005, 2006). Even though a major focus was given to the student's experience, the primary means to achieve success was the development of the participating instructors knowledge of design, subject matter, pedagogy and technology, and how they all come together to meet the desired outcome.

In addition to the context listed above, this study is situated at the heart of the current practice of "flipping" instruction (Tucker, 2012). Although much of the current practice is primarily based on getting the content online for use prior to the face-to-face class, this study moved beyond the content and the technology and into the pedagogy. Including a student activity to accompany the online lecture to facilitate more engagement and a sense of connectedness is a factor that has not been discussed as much within the practice of flipped instruction.

Suggestions for further research

The findings of this study suggest that in addition to developing high quality online lectures, instructors should provide student activities to increase the level of student engagement. Further research could possibly include a study of these activities. Should these activities focus on student-to-student engagement, student-to-teacher engagement, or student-to-content engagement? Another factor to be studied is the difference between the type of student activity for online lectures that are used in blended or flipped classes versus the type of activities that would be best used for online lectures in fully online courses.

Mishra and Koehler (2005), in their article about learning by design said that "meaningful learning is possible when learners are given opportunities to leverage prior knowledge and experience as they engage in tasks that are meaningful to them. Hence, authentic learning opportunities maintain a balance between the learning activity and the relevance of the activity to the lives of the students and real-world practitioners." (p. 95). This statement could apply to both the student learning experience being directed by the instructor's assigned activity as well as to the instructors' learning process of developing and using online lectures.

In this study, as in Mishra and Koehler's (2005) article, a small group of instructors further developed their educational technology knowledge and skills by designing their online lectures in an authentic situation. Through this process they developed a better understanding of pedagogy with respect to using online lectures. Throughout this study the participating instructors were required to

navigate the necessarily complex interplay between tools, artifacts, individuals, and

> contexts. This allows teachers to explore the ill-structured domain of educational technology and develop flexible ways of thinking about technology, design and learning, and thus develop Technological Pedagogical Content Knowledge. (p. 99).

Implications for Academic Technology Support and Faculty Development

The results of this study will hopefully inform academic technology support personnel and instructional designers who work with higher education faculty from other colleges and universities. The need to effectively use online lectures is global in our current state of higher education (and even now in secondary education settings as well). In fact, the need is so widespread that I just did a Google search for "developing online lectures for college courses" and got over 89 million results (at 3:07 p.m. on June 17, 2015). So what are the takeaways from this study?

First, providing a guide or template is a quick and easy way to remind teachers of the things that they probably already know, but don't always think about. It helps them stay focused to reach their objective during the development phase and it reminds them of instructional practices to increase student engagement. Things that come "naturally" to experienced teachers during their face-to-face courses need to be consciously thought out ahead of time for online instructional experiences.

In addition to providing a template, universities should consider making some of the technology tools available to their instructors. Many of these tools can be found online for free, but in most cases a paid subscription allows for more storage or more features to enhance the capabilities of the product. Subscriptions to certain services could also help support centers (like my university's Center for Online Learning) by providing teacher training or even administrative support by allowing an administrator to log into the

instructor's account without having them share their private password. For this study, the majority of the teachers used the free account at BrainShark.com, but if an "Enterprise" version (university wide) would be adopted, the additional tools and features would be beneficial.

The learning curve for the instructors was steeper than expected. Although they gained an academic understanding of the template and technology tools quite easily, they discovered that to do a good job required a fair amount of practice and experience. This in another reason why having the academic technology support center involved would be beneficial. Faculty Development opportunities could be scheduled and offered on a consistent basis to provide the faculty with the training and experience to be able to reach a level of expertise with the template and technology tools in an efficient manner.

When looking at the limitations or possible next steps for this research, it is necessary to point out that all of the participating instructors/courses for this study were within the School of Education (even the mathematics course was in math education). This has implications in light of TPACK. The technology involved, or student activities might be considerably different in the Humanities, Sciences, medical, or other disciplines.

Reconnecting to the Literature Review

According to Scherokman & Waechter, enthusiasm for the subject and other non-verbal cues will carry over into the student's attention and engagement with the lecture (n.d.). However, even though this idea was included in the template, some of the instructors had trouble with bringing enthusiasm into the recorded lectures. In the first cycle of this study, several students commented that presenter quality, specifically voice quality (lack of enthusiasm and monotone), was a factor that needed improvement. This is

a skill that takes some time to develop, and the instructors did get better over time. By the second cycle, no comments were made concerning the instructors' enthusiasm.

While instructors typically have no problem controlling the environment of a face-to-face lecture, they don't have control over the environment/context in which the student views the online lecture. Because of this, an instructor must devise ways to foster engagement between the student and the online lecture (Blanco, 2008; Cunniff et al., 2005; Wilson & Korn, 2007). One key finding of this study showed that student activities embedded in the online lectures that were designed to provide immediate engagement for the students led to higher student satisfaction, and one can posit that it lead to better student understanding.

Ever since the concept of "flipping" a classroom was introduced, the idea has been to make better use of limited class time by putting some of the instruction online to be viewed ahead of time (Tucker, 2012). According to the student surveys, 67% of the students felt that class time was being better used now that the lectures were online and 90% claimed to be able to ask better questions in the following class session. This appears to be a strong indication that flipping a classroom is an effective strategy for some educational experiences.

One of the criticisms that the lecture has received in the past few decades is that it does not allow for student interaction (Bligh, 1972; Kroenke, 1984). The lecture has been called a "grossly inefficient way of engaging with academic knowledge and ill suited to facilitating a learning process" (Laurillard, 2002, p. 102). However, the results of this study have shown that with online lectures the students can pause and process, ask questions to be answered in class, and replay sections multiple times to facilitate better understanding.

Student survey results show that 91% of the students feel like they are understanding better when they can review the lectures, about 70% replayed sections and about 85% engaged with the activities connected to the lectures. That is strong evidence that online lectures solve some of the problems associated with traditional lectures due to the addition of technology (the intersection of Technology and Pedagogy from the TPACK framework).

Several years ago EDUCAUSE published five challenges for teaching and learning with technology in higher education:

6. Creating learning environments that promote active learning, critical thinking, collaborative learning, and knowledge creation.
7. Developing 21st century literacies (information, digital, and visual) among students and faculty.
8. Reaching and engaging today's learner.
9. Encouraging faculty adoption and innovation in teaching and learning with IT.
10. Advancing innovation in teaching and learning with technology in an era of budget cuts. (EDUCAUSE, 2010)

The effective use of online lectures with student activities from this study creates a learning environment that (a) promotes active learning, (b) reaches and engages today's learner, (c) requires faculty to adopt innovative IT based teaching and learning, and (d) advances innovation in teaching and learning with technology.

Conclusion

The original problem, which prompted this research study, was that the teachers who had begun to use online lectures discovered that their students were not always

viewing the lectures and therefore were not engaging with the presented material. Through the process of improving the design of the online lectures and pedagogical strategies for using the lecture, student engagement and satisfaction with the lectures rose. Now, after several cycles of refinement, the practice is ready for dissemination in the hopes that it can lead to transforming current educational practices into powerful teaching and learning experiences.

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APPENDIX A

Activities to Use With Online Lectures

This survey is designed to evaluate the effectiveness of your professor's online lecture. It has no impact on your grade in the course and is completely voluntary. As you complete this survey, please answer solely based on your experience with the recently viewed online lecture. At any time you may skip a question that you do not want to answer. This survey should take approximately 5-10 minutes to complete. All participants of this survey will be entered into a drawing for a $50 gift card.

By continuing to complete this survey and marking the box below, you hereby consent to participate in a research study and allow your responses to be used for said study. This study is part of a dissertation that is being completed at Pepperdine University by Terry Bese, under the supervision of Dr. Linda Polin. Your identity will be protected and your individual responses to the questions will not be accessible by anyone except the primary investigator of this research study. This means that your instructor will not see your responses or even know if you participated so there is no possibility that it could impact your grade in this course. Your identity will only be necessary if you wish to participate in the drawing for the $50 gift card given away with each survey. All survey data will be aggregated and individual responses will not be published. The risk to you for participating in this study is minimal and the possible benefits for improved educational experiences at your university are immeasurable. Possible risks could include emotional discomfort with the sense that your personal opinions might be discovered by your instructor, but I assure you that will not happen. You are not required in any way to participate and may stop at any time. Any questions that you might have, or requests for the results of the research study, will be answered by contacting Terry Bese at tlbese@fresno.edu.

Please select the answer that describes you and skip a question if it is not applicable to you.

1. Consent

- ○ I consent to participate in this research study as described above.
- ○ I do not consent to participate in this research study as described above.

2. To be entered into the drawing for the $50 gift card please provide an email address where you can be contacted.

3. What course did you watch an online lecture in?

- ○ LA-325-XON20 (Lindberg)
- ○ LANG-331-LVI94 (La Clare)
- ○ MTH-765-ONA1 (Brownell)
- ○ ECD-300 (Kaitfors/Gossett)
- ○ ECD-450-ELE62 (Young)

4. What is your intended or declared major?

5. How many years of college have you had?

- ○ This is my first year
- ○ second year
- ○ third year
- ○ fourth year
- ○ more than four

6. Do you watch many online videos (Youtube, Vimeo, others)?

- ○ Yes
- ○ No

7. Do you use social media (Facebook, Twitter, other)?

- ○ Yes
- ○ No

8. Which category below includes your age?

- ○ 17 or younger
- ○ 18-20
- ○ 21-25
- ○ 26-30
- ○ 30-39
- ○ 40 or older

9. I watched the online lecture straight through.

- ○ Yes
- ○ No

10. I paused and replayed sections.

- ○ Yes
- ○ No

11. I did the activities associated with the videos.

- ○ Yes
- ○ No

12. I watched with others.

○ Yes

○ No

13. I viewed the lecture at multiple times.

○ Yes

○ No

14. I talked about the videos outside of class.

○ Yes

○ No

15. I watched on a mobile device.

○ Yes

○ No

16. I enjoyed the video lecture experience.

○ Yes

○ No

17. I felt alone and cut off when viewing lectures outside the class setting.

○ Yes

○ No

18. I fast forwarded over the parts that I think I already know.

○ Yes

○ No

19. I experienced technical problems trying to view the lecture.

○ Yes

○ No

20. I found it hard to see or hear.

○ Yes

○ No

21. I understood how the video lectures are supposed to be used for this class.

○ Yes

○ No

22. I think that I am doing better in this class than I would have without the video lectures.

○ Yes

○ No

23. I wish my other classes would use video lectures.

○ Yes

○ No

24. I feel like the time in class is better spent now that the lectures are online.

○ Yes

○ No

25. I feel like I am understanding better when I can review the lectures.

○ Yes

○ No

26. I think that it is harder to understand in this format.

○ Yes

○ No

27. I can't tell if I am getting it.

○ Yes

○ No

28. I watch the videos to review.

○ Yes

○ No

29. I take notes when I watch.

○ Yes

○ No

30. I download the videos onto mobile devices.

- ○ Yes
- ○ No

31. I wish that I could download onto mobile devices but was not able to.

- ○ Yes
- ○ No

32. I can ask better questions or participate better in class after watching the video beforehand.

- ○ Yes
- ○ No

33. It is clear to me what to do when I don't understand something in the lecture.

- ○ Yes
- ○ No

34. I prefer having my fellow students around me when I am trying to learn from lectures.

- ○ Yes
- ○ No

35. It is easier to see and hear this way than in a large classroom/lecture hall.

- ○ Yes
- ○ No

36. I feel like the length was too long.

- ○ Yes
- ○ No

37. I feel like the length was too short.

- ○ Yes
- ○ No

38. What do you think could be changed to improve the use of online lectures for you?

APPENDIX B

Side-by-Side Data Comparison

Cycle I	Cycle II
Major area of study: Business – 9 (16%) Early Childhood Devel – 19 (35%) Mathematics – 5 (9%) Liberal Arts – 19 (35%) Nursing – 1 (<2%) MFT Counseling – 1 (<2%) Criminology – 1 (<2%)	Major area of study: Business – 1 (3%) Early Childhood Devel – 21 (57%) Mathematics – 11 (30%) Liberal Arts – 1 (3%) Nursing – 2 (5%) MFT Counseling – 0 (0%) Criminology – 0 (0%)
Number of years of college: One – 3 (5%) Two – 2 (3%) Three – 11 (19%) Four – 15 (26%) More than four – 26 (46%)	Number of years of college: One – 2 (5%) Two – 2 (5%) Three – 0 (0%) Four – 8 (22%) More than four – 25 (68%)
Do you watch many online videos (YouTube, Vimeo, others)? Yes – 48 (83%) No – 10 (17%)	Do you watch many online videos (YouTube, Vimeo, others)? Yes – 28 (76%) No – 9 (24%)
Do you use social media (Facebook, Twitter, other)? Yes – 47 (81%) No – 11 (19%)	Do you use social media (Facebook, Twitter, other)? Yes – 31 (84%) No – 6 (16%)
Which category below includes your age? 17 or younger - 0 18-20 - 0 21-25 – 17 (29%) 26-30 – 10 (17%) 30-39 – 13 (22%) 40 or older – 18 (31%)	Which category below includes your age? 17 or younger – 0 18-20 – 0 21-25 – 15 (41%) 26-30 – 3 (8%) 30-39 – 8 (22%) 40 or older – 11 (30%)
I watched the online lecture straight through. Yes – 46 (79%) No – 12 (21%)	I watched the online lecture straight through. Yes – 31 (86%) No – 5 (14%)

I paused and replayed sections. Yes – 39 (67%) No – 19 (33%)	I paused and replayed sections. Yes – 27 (77%) No – 8 (23%)
I did the activities associated with the videos. Yes – 47 (84%) No – 9 (16%)	I did the activities associated with the videos. Yes – 32 (89%) No – 4 (11%)
I watched with others. Yes – 4 (7%) No -54 (93%)	I watched with others. Yes – 2 (5%) No – 35 (95%)
I viewed the lecture at multiple times. Yes – 23 (40%) No – 35 (60%)	I viewed the lecture at multiple times. Yes – 15 (42%) No – 21 (58%)
I talked about the videos outside of class. Yes – 29 (50%) No – 29 (50%)	I talked about the videos outside of class. Yes – 17 (46%) No – 20 (54%)
I watched on a mobile device. Yes – 12 (21%) No – 46 (79%)	I watched on a mobile device. Yes – 3 (8%) No – 34 (92%)
I enjoyed the video lecture experience. Yes – 50 (88%) No – 7 (12%)	I enjoyed the video lecture experience. Yes – 35 (95%) No – 2 (5%)
I felt alone and cut off when viewing lectures outside the class setting. Yes – 7 (13%) No – 49 (88%)	I felt alone and cut off when viewing lectures outside the class setting. Yes – 3 (8%) No – 34 (92%)
I fast forwarded over the parts that I think I already know. Yes – 5 (9%) No – 53 (91%)	I fast forwarded over the parts that I think I already know. Yes – 5 (14%) No – 32 (86%)
I experienced technical problems trying to view the lecture. Yes – 7 (12%) No – 50 (88%)	I experienced technical problems trying to view the lecture. Yes – 3 (8%) No – 34 (92%)

I found it hard to see or hear. Yes – 10 (17%) No – 48 (83%)	I found it hard to see or hear. Yes – 2 (5%) No – 35 (95%)
I understood how the video lectures are supposed to be used for this class. Yes – 50 (88%) No – 7 (12%)	I understood how the video lectures are supposed to be used for this class. Yes – 36 (97%) No – 1 (3%)
I think that I am doing better in this class than I would have without the video lectures. Yes – 33 (58%) No – 24 (42%)	I think that I am doing better in this class than I would have without the video lectures. Yes – 14 (38%) No – 23 (62%)
I wish my other classes would use video lectures. Yes – 45 (79%) No – 12 (21%)	I wish my other classes would use video lectures. Yes – 28 (78%) No – 8 (22%)
I feel like the time in class is better spent now that the lectures are online. Yes – 37 (67%) No – 18 (33%)	I feel like the time in class is better spent now that the lectures are online. Yes – 22 (65%) No – 12 (35%)
I feel like I am understanding better when I can review the lectures. Yes – 53 (91%) No – 5 (9%)	I feel like I am understanding better when I can review the lectures. Yes – 32 (91%) No – 3 (9%)
I think that it is harder to understand in this format. Yes – 9 (16%) No – 48 (84%)	I think that it is harder to understand in this format. Yes – 8 (22%) No – 29 (78%)
I can't tell if I am getting it. Yes – 7 (12%) No – 50 (88%)	I can't tell if I am getting it. Yes – 7 (20%) No – 28 (80%)
I watch the videos to review. Yes – 44 (79%) No – 12 (21%)	I watch the videos to review. Yes – 20 (56%) No – 16 (44%)
I take notes when I watch. Yes – 46 (79%)	I take notes when I watch. Yes – 25 (69%)

No – 12 (21%)	No – 11 (31%)
I download the videos onto mobile devices. Yes – 2 (3%) No – 56 (97%)	I download the videos onto mobile devices. Yes – 1 (3%) No – 36 (97%)
I wish that I could download onto mobile devices but was not able to. Yes – 13 (22%) No – 45 (78%)	I wish that I could download onto mobile devices but was not able to. Yes – 5 (14%) No – 31 (86%)
I can ask better questions or participate better in class after watching the video beforehand. Yes – 52 (91%) No – 5 (9%)	I can ask better questions or participate better in class after watching the video beforehand. Yes – 30 (88%) No – 4 (12%)
It is clear to me what to do when I don't understand something in the lecture. Yes – 35 (63%) No – 21 (38%)	It is clear to me what to do when I don't understand something in the lecture. Yes – 24 (69%) No – 11 (31%)
I prefer having my fellow students around me when I am trying to learn from lectures. Yes – 28 (48%) No – 30 (52%)	I prefer having my fellow students around me when I am trying to learn from lectures. Yes – 24 (65%) No – 13 (35%)
It is easier to see and hear this way than in a large classroom/lecture hall. Yes – 34 (61%) No – 22 (39%)	It is easier to see and hear this way than in a large classroom/lecture hall. Yes – 25 (68%) No – 12 (32%)
I feel like the length was too long. Yes – 7 (12%) No – 51 (88%)	I feel like the length was too long. Yes – 2 (5%) No – 35 (95%)
I feel like the length was too short. Yes – 1 (2%) No – 57 (98%)	I feel like the length was too short. Yes – 0 (0%) No – 37 (100%)

APPENDIX C

IRB Approval Letter

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

February 25, 2015

Terry L Bese

Protocol #: E0714D07
Project Title: Effective Online Instructors: Improving Practice through Design and Pedagogy

Dear Ms. Bese:

Thank you for submitting your application, *Effective Online Instructors: Improving Practice through Design and Pedagogy,* for exempt review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your faculty advisor, Dr. Polin, have done on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations (45 CFR 46 - http://www.nihtraining.com/ohsrsite/guidelines/45cfr46.html) that govern the protections of human subjects. Specifically, section 45 CFR 46.101(b)(2) states:

> (b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:
>
> **Category (2) of 45 CFR 46.101**, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

In addition, your application to waive documentation of informed consent has been **approved**.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact Kevin Collins, Manager of the Institutional Review Board (IRB) at gpsirb@peppderdine.edu. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

Thema Bryant-Davis, Ph.D.
Chair, Graduate and Professional Schools IRB

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Mr. Brett Leach, Compliance Attorney
Dr. Linda Polin, Faculty Advisor