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## **AC 2011-1012: USING THE EXCEED MODEL FOR DISTANCE EDUCATION**

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# Using the ExCEED Teaching Model for Distance Education

## Abstract

The purpose of this paper will be to present an investigation by one program to teach distance education while staying as true as possible to the American Society of Civil Engineers (ASCE) ExCEED Teaching Model. The program is being required to offer distance education in the very near future and they desire to maintain the same quality of teaching that has marked their program so far – teaching with one eye on the ASCE ExCEED Teaching Model. Many universities across the nation are resorting to distance education to not only meet the needs of students from a distance, but also to decrease the demands on the current facilities while providing the courses needed by the students.

The faculty decided to conduct a test by video taping lessons and evaluating the quality of these sessions against the ASCE ExCEED Teaching Model based on the use of learning objectives, board notes, color, questioning techniques, consideration of learning styles, writing material on the white board versus PowerPoint to build board content while using questioning techniques, etc. Then the faculty completed the same lesson using Camtasia screen recorder software (voice over PP and/or a talking head). The faculty team assessed the quality of these techniques and determined what was missing from the ASCE ExCEED Teaching Model within the distance education products. Based on the assessment by the faculty, the team determined what adjustments in teaching style were needed to increase the quality of instruction using the available distance education platform. The ultimate goal was to provide the best quality instruction no matter the medium. The real challenge will be laboratory lessons where the students usually need to see the experiment as well as collect data for the lab report.

This paper will provide lessons learned from this process and how well the distance education using the available platforms compares to face-to-face teaching. The process presented will be useful to other program that may already be providing distance education, but have no idea about the quality of their product or no methodology to compare the product to the ultimate teaching platform – face-to-face. This paper will also present recommendations on improvement of the process and student assessment of the quality of the classes as compared to traditional lessons.

## 1.0 Introduction

What is distance education? The question seems reasonable enough. If you Google “Distance Education” you will get 2,600,000 hits. The sponsored link by American Public University highlights what most people today consider “distance education” – an on-line single course and/or multiple courses leading to a degree opportunity. The definition provided by Honeyman and Miller<sup>1</sup> is "a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both." Distance education began through the use of correspondence where information was shared between two people and today hundreds could be attending the same lesson either synchronous or asynchronous. The quality of the distance education

can vary dramatically just as it can within the face-to-face classroom instruction without proper training of the faculty. The ultimate goal in distance education is to provide the same possible active learning environment as a face-to-face class using appropriate technology and pedagogical theory and teaching skills.

There is a market for quality education at a distance for those that do not have the opportunity to attend a university due to either distance (not located near a college or university) or time (must work full time and limited offering of courses at night). The other main reason so many colleges and universities are getting into distance education is money. More students in courses without the need for more teachers and facilities are primary motivators. In the opinion of one instructor, Old Dominion University resurrected itself through the offering of distance education to those associated with the U.S. Navy.<sup>2</sup> The Sloan survey of more than 2,500 colleges and universities nationwide finds approximately 5.6 million students were enrolled in at least one online course in fall 2009.<sup>3</sup> Some schools are currently experimenting with hybrid courses that require the student to attend some lessons on campus such as examinations and laboratory exercises. These types of activities allow for more students to be taught without an increase in infrastructure since two different courses can use the same classroom at the same time.

## **2.0 Teaching Distance Education with Eye on the ASCE ExCEED Teaching Model**

### **2.1 ASCE ExCEED Teaching Model**

Due to the fact that a majority of instruction is still conducted face-to-face and the quality varies greatly, many teaching workshops have been developed to meet the cry of faculty, administrators, and students looking to improve teaching and student learning. A Google search of “Teaching Workshops” leads to over 236,000 hits. Some of the more successful and well known workshops supported by educational research are Richard Felder’s workshops (12 hits) and the ASCE ExCEED Teaching Workshop (135 hits). It appears that most of the remaining hits are teaching workshops being offered at local universities and colleges as part of their internal teaching development programs. Even the American Society of Mechanical Engineers (ASME) has developed a workshop as an off-shoot of the ASCE ExCEED Teaching Workshop.

The one workshop that appears to stand above the rest is the ASCE ExCEED Teaching Workshop due to its hands-on attitude that results in three practice classes by each participant applying what they have learned during the workshop. This workshop has led to over 550 Civil Engineering Faculty graduates from over 200 universities with many earning teaching awards after attending the workshop. The participants have reported huge gains in skills within 6-12 months of the workshop in areas such as lesson organization, presentation of material, voice, student interaction, use of demonstrations and visual aids, energy and enthusiasm, confidence, levels of student learning, and student evaluations (Fig. 1).<sup>4</sup> Figure 2<sup>4</sup> shows the delta in improvement over six years, and current data shows very consistent results. Interestingly, a fair number of the ASCE ExCEED Teaching Workshop participants are seasoned faculty who are still needing to learn how to teach effectively.

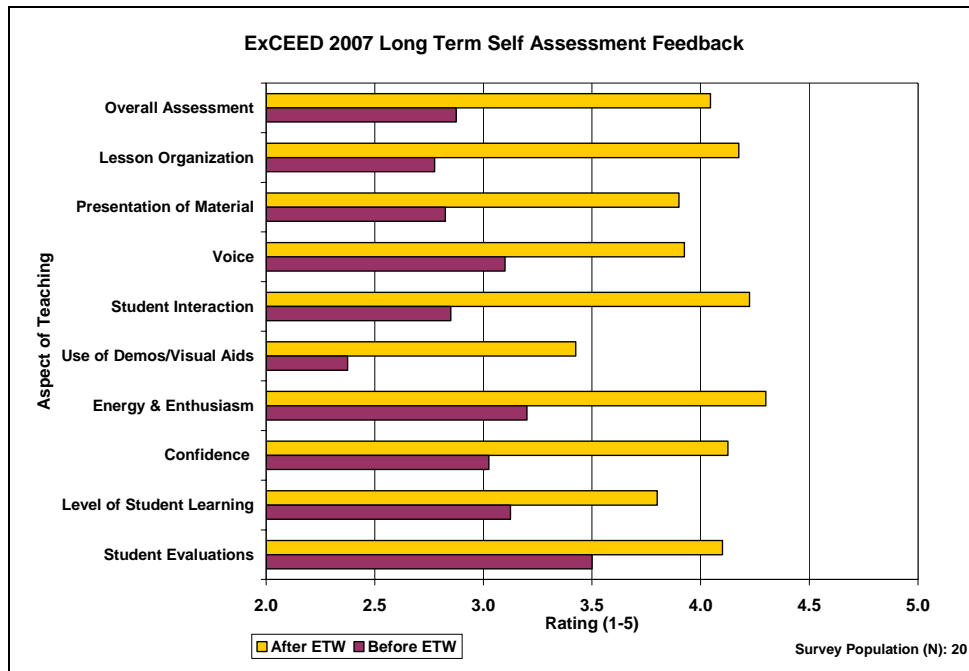


Figure 1. Long Term Self Assessment Feedback From ASCE ExCEED 2007 Participants

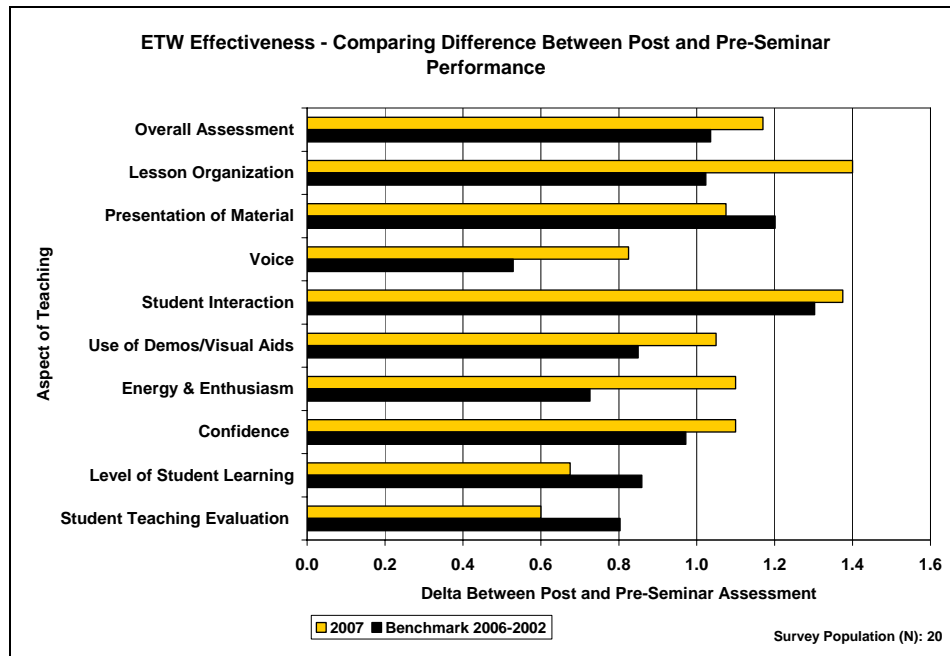


Figure 2. The magnitude of improvement self-assessed by respondents as a result of ASCE ExCEED Teaching Workshop (ETW)

When participants (40 percent response rate) from the first 10 years of the ExCEED Teaching Workshop were surveyed on how often they use these same skills from the ASCE ExCEED Teaching Workshop, the results were simply impressive (Fig. 3)<sup>4</sup>. It is clear that teaching evaluations have improved, the workshop was important to their personal growth as a teacher, they would highly recommend the workshop to new

faculty, and that it has assisted them in their tenure goals (Fig. 4)<sup>4</sup>. Department chairs at the Annual Department Heads conference have fully endorsed the need for the ExCEED Teaching Workshop based on the observed impact on those who have previously attended. In fact, the impact on past participants is clearly observed in Department Head recommendations for their faculty they are currently wanting to attend the workshop.

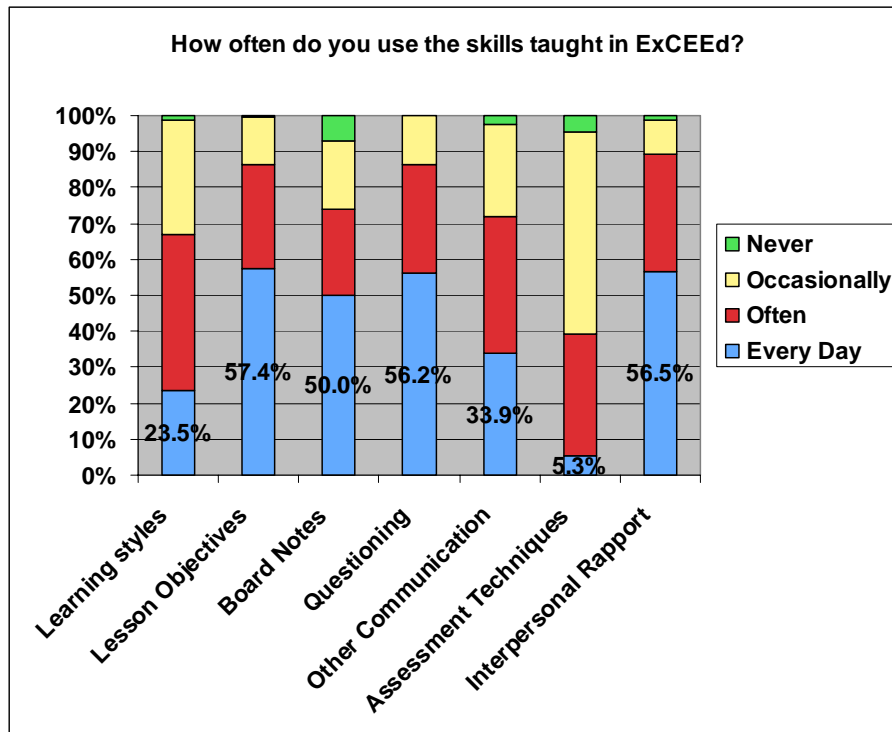


Figure 3. Longitudinal survey results (ETW 1999-2007) regarding how often the skills taught in ExCEED are used.

The ASCE ExCEED Teaching Workshop is pedagogically based and has used teaching compendiums by many authors<sup>5-11</sup> to develop the ASCE ExCEED Teaching Model that is both student and teacher focused (Fig. 5).<sup>12</sup> The entire faculty within the Civil Engineering Department at the University of Texas at Tyler (UT Tyler) have attended and believe that the model is essential to their individual teaching successes and the reputation for the entire department. Some have gone as far as to tape the slide along with the Model Instructional Strategy (Fig. 6)<sup>13</sup> on the desk storage cabinet above the area where they prepare each lesson as a reminder of what is important. Therefore, since the ExCEED Teaching Model has been used successfully for face-to-face education and the principles are pedagogically based, it should be able to be applied to distance education.

Let's discuss each section of the model (Fig. 5) as it is presented within the ASCE ExCEED Teaching Workshop. A structured organization is important in everything we do as teachers.<sup>14</sup> There is already little face-time with the students and every second must be used to achieve the ultimate goal – enhanced learning on the student's part. There are those that will say that providing learning objectives is equivalent to spoon-feeding, but what better way for an instructor to communicate what is important than to provide

learning objectives starting with an action verb.<sup>15</sup> The lesson activities should be based on the subject matter and vary occasionally to appeal to all of the learning styles within the student base. Teaching only in the faculty or student's preferred manner will only appeal to some students and never forces all students to learn in different ways. Without the variation, faculty might be pushing some students away from the discipline rather than retaining them.<sup>10,11</sup>

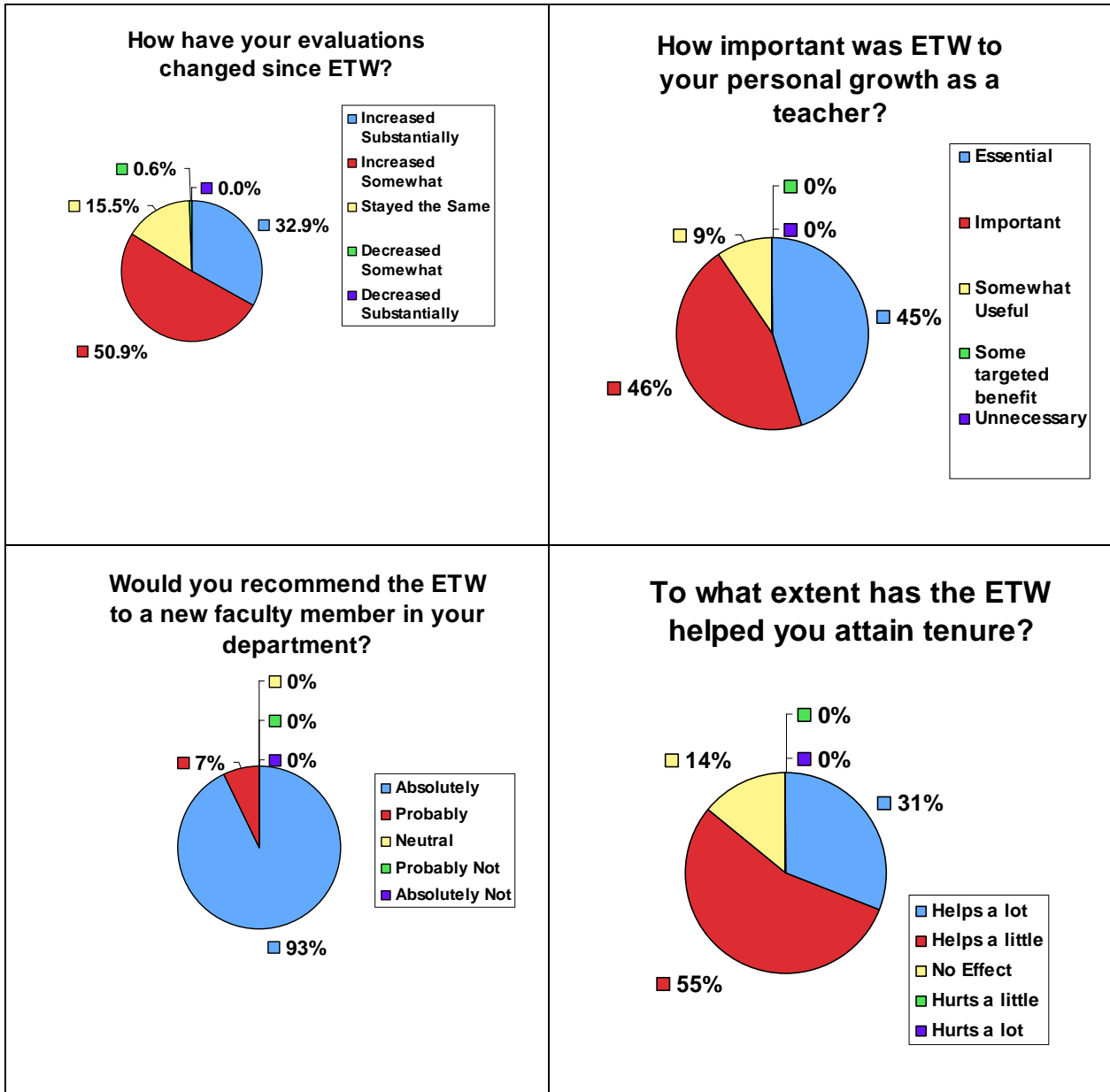


Figure 4. Longitudinal survey results (ETW 1999-2007) on the long term effectiveness of the ExCEED Workshop.

The lesson should always actively engage the student's within the learning process. The easiest step is using physical models and demonstrations within each lesson to appeal to the visual, global, sensory and active learner.<sup>16,17,18</sup> These students can connect

physically to what they see to what they calculate. The physical models can be extended to the drawings that are provided as part of the organized lesson presentation that is clearly written on the board and stated for the verbal, sequential, and reflective learners in the student body.<sup>19</sup> The written presentation, if it remains on the board for a period of time and not immediately erased or passed by through the clicking to the next PowerPoint slide, assists the reflective learner. Additionally, there is a need to get out into the student body mass while the instruction is happening. Faculty must not be afraid to walk among the students as they ask and answer student questions.<sup>20</sup>

**The ASCE “ExCEED Model”**

- ◆ **Structured organization**
  - Based on learning objectives
  - Appropriate to the subject matter
  - Varied, to appeal to different learning styles
- ◆ **Engaging presentation**
  - Clear written and verbal communication
  - High degree of contact with students
  - Physical models & demonstrations
- ◆ **Enthusiasm**
- ◆ **Positive rapport with students**
- ◆ **Frequent assessment of student learning**
  - Classroom assessment techniques
  - Out-of-class homework and projects
- ◆ **Appropriate use of technology**

**Teacher As Positive Role Model**

Figure 5. Seminar II Slide from the ASCE ExCEED Teaching Workshop.

Faculty must be excited to walk into the classroom. They are there to help students develop the same passion about the subject matter that they have. Every faculty member should be thrilled to talk about and assist others in learning about their profession. So why do many faculty appear stoic in the classroom? Is it a need to remain professional to the point of showing no emotion? Easy ways to show excitement during a lesson is to move quickly to the whiteboard to include a student’s response, to display excitement in the voice when responding “exactly” to a student’s great insight, and even smiling as if you like college age students.<sup>5,21</sup> Enthusiasm goes a long way to developing a positive rapport with students. Getting to know them by knowing their names, hobbies, and interests can assist in breaking down barriers that inhibit student learning such as “the faculty just do not like me.” Showing an interest in students lets them know that both sides are working together during the learning process. The easiest method is coming early to class and staying after class to visit with and answer student questions.

Faculty need to know what students know. Students need to know what they know and do not know. Many faculty use timed exams as the primary source of assessing student learning. However, simple classroom assessment techniques can be used during class that assists the faculty in quickly assessing what the students know.<sup>22,23</sup> Faculty should also

occasionally have the students solve problems in class singly and in pairs. These types of exercises vary the learning style focus in the classroom and allow the faculty to walk around the room and observe how the students are solving the problem. Of course, nothing should be tested on an exam if the students have not wrestled with a harder problem in homework or a project and received feedback from the instructor.

The hardest part of the model for many faculty is only using technology if it is the right technology to assist in student learning.<sup>24</sup> Many faculty have become PowerPoint junkies because they can push an incredible amount of material at the students. How much have they retained? What about the reflective student who needs to think about the content some before they understand it? Faculty should strive to use PowerPoint to present pictures, drawings, design situations, etc. Actual problem solving should remain a talk and chalk activity where the student observes the problem solving procedure as it is developed by the faculty. Additional appropriate use of technology are: using Excel to conduct what-if scenarios after solving the initial condition, showing simulations that mirror the calculations shown in class, etc.

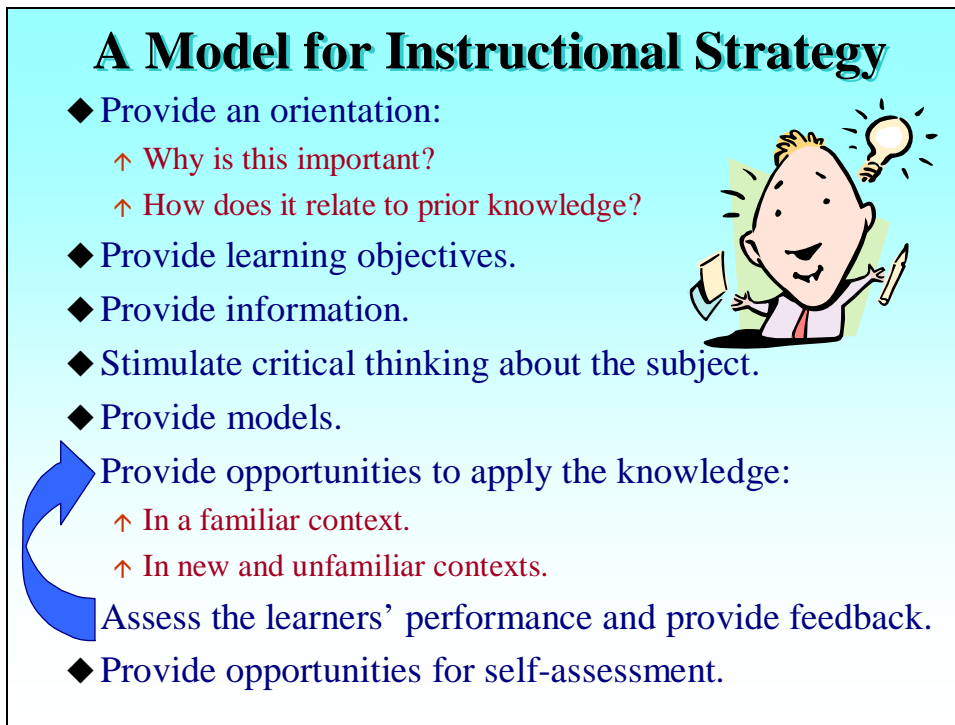


Figure 6. Seminar I Slide from the ASCE ExCEED Teaching Workshop.

## 2.2 Distance Education

Even though not an ideal source, Wikipedia<sup>25</sup> provides an extensive list of distance education conducted since 1728 such as:

- Correspondence conducted through regular and electronic mail
- Internet conducted either synchronously or asynchronously
- Telecourse/Broadcast, in which content is delivered via radio or television



- CD-ROM, in which the student interacts with computer content stored on a CD-ROM
- PocketPC/Mobile Learning where the student accesses course content stored on a mobile device or through a wireless server
- Integrated distance learning, the integration of live, in-group instruction or interaction with a distance learning curriculum
- Online tutoring

Most faculty who have listened to any discussion on distance education have heard the words synchronous and asynchronous. Synchronous deals with students observing the class in real time and asynchronous deals with students observing the class after it occurs, is processed, and posted for viewing.

Synchronous technologies<sup>25</sup> such as:

- Web-based VoIP
- Telephone
- Videoconferencing
- Web conferencing
- Direct-broadcast satellite
- Internet radio
- Live streaming

Asynchronous technologies<sup>25</sup> such as:

- Audiocassette
- E-mail
- Message board forums
- Print materials
- Voice Mail/fax
- Videocassette/DVD
- On Demand Streaming (Delayed)

Old Dominion University uses live streaming video to provide content to their students.<sup>2</sup> The class is taught in front of a limited number of students who can attend in person (approximately 12 on-site students – room size) and streamed to those not able to attend on-campus classes. The faculty try to interact with the students not on site by allowing them to e-mail in questions and respond to questions asked by the instructor. However, the time-lag of the synchronous live streaming is about 30-40 seconds and the time it takes to pose a question or answer a question by e-mail results in most questions and answers from the students off-campus arriving way too late for the faculty member to answer or use in the lesson development. Some faculty have resorted to stopping the lesson to focus on off-campus students about mid-way through class and at the end of class.<sup>2</sup> Even though synchronous distance education was selected to provide the best scenario, the off-campus students and faculty are not happy with the results.

### 2.3 Apply the ASCE ExCEED Teaching Model to Distance Education

The Civil Engineering faculty at UT Tyler are not convinced that distance education is the best way for students to learn based on their current successes in the classroom teaching face-to-face. However, the University leadership is following the path of other schools and investing in distance education software packages to provide distance education to students who cannot attend during class time due to work or not being close enough to attend school in person. As part of this exploration process, the department has purchased a software package (Camtasia Studio) for capturing powerpoint presentations, voice, and/or web camera video. Other costs include a HD web camera and headset with microphone. The total cost of all these tools was less than \$500. Video taping of live class sessions for this evaluation was performed with a typical camcorder and tripod setup. The department has decided to experiment with distance education packages to develop Best Practices to ensure most of the pedagogically sound and successful ASCE ExCEED Teaching Model is used.

Obviously fully taping a live class with natural student interaction, processing it, and posting for student review would be the optimum choice that would allow all aspects of the ASCE ExCEED Teaching Model to be employed except for a high degree of contact and developing positive rapport with the students who are not in class. Those students would not be able to pose a question or respond to a question just as some students do not participate in live classes (not usually at UT Tyler where the faculty try to include each student in answering faculty or student questions). Currently the UT Tyler faculty develop rapport and a high degree of contact through questioning, observing in-class working sessions, and visiting with students before and after class when the students come to office hours.

What if the entire session is taped and no students are in the class? The issues previously mentioned apply to all students in the class whether in person or not. Without actual experience in distance education, what might be the best methods to use in applying as many of the principles within the ASCE ExCEED Teaching Model? With an eye on the ASCE ExCEED Teaching Model, the current consensus is to use PowerPoint and/or writing pad (each when appropriate), a talking head to provide faculty facial expressions and other non-verbal communication as well as demonstration of physical models, and Blackboard to provide the taped sessions and chat rooms to provide office hours and assistance. Additionally, faculty will need to pose questions just as they would in class, pause, and then answer themselves to allow students a chance to critically think about the answer. It is unknown at this time if some questions to be posed in class could be answered on blackboard before the session can continue. This technique would be like using clickers in large enrollment classes.

The faculty feel that these procedures allow the distance education to most closely match face-to-face teaching using the ASCE ExCEED Teaching Model. For example, a very structured organization is equally important within distance education to ensure students who cannot ask questions in class or right after class obtain the level of desired learning. Providing daily lesson learning objectives before the lesson is even more important to

assure students focus on the key knowledge from the lesson since they may not have other students to collaborate with when completing homework. The use of action verbs<sup>15</sup> with each learning objective clearly implies the proper level of objective demonstration required to master key concepts. Lesson activities based on the subject matter and varying occasionally to appeal to all of the learning styles will be even more important to ensure students stay focused during viewing of the lesson. However, faculty cannot forget the voice. A monotonic voice will lose the focus of students faster than difficult content. Of course, the distance education student has a slight advantage in this respect in that they can view the lesson as many times as they need to. But this advantage should not be taken advantage of by faculty not interested in providing quality lessons through distance education since even these students have a limited amount of time to devote to each lesson as well.

Even though the camera probably only has a six foot focal length, faculty with practice should be able to use physical models and small demonstrations. Faculty should consider using a laptop for developing distance education lessons since the office machine might limit the space beyond six feet needed to get the demonstration and physical model into view. Students need to connect physically what they see to what they calculate even if through the lenses of a camera. The use of the drawing/writing tablet allows for faculty to develop drawings just as they would on a whiteboard. The use of the drawing/writing tablet may be a little more difficult to use than a whiteboard, but with practice clear written and graphical communication are possible, especially if faculty say what they are writing as is taught within the ExCEED Teaching Workshop when the body blocks the written area. Since the student is in control of the viewing of the presentation, they can back up the presentation to review previous material such that PowerPoint slides with builds may be the best method for written communication. Unfortunately, with no students and no direct contact with students, there is no way to actually walk among the students nor ask them questions. Nonetheless, faculty must still ask questions, pause, and then answer the question to develop critical thought within the lesson.

Some faculty may be tempted to just solely use the voice over PowerPoint feature available with the Camtasia software. It will be extremely difficult to not become completely monotonic. Using the talking head in the corner of the screen and normal face and hand gestures should combat the possibility of becoming monotonic. In fact, faculty must dial up the excitement and volume meter and possibly be over the top to pass through the airwaves the excitement they have for the subject they are teaching. The process is similar to male actors using eye and face makeup to help exaggerate facial expressions on stage. The students must feel the passion of the faculty for the subject matter. The voice is going to be a key tool to showing excitement since they cannot run to the whiteboard to add a student's response. If using chat rooms to facilitate group discussion on projects, faculty will need to closely follow who is saying what and refer to them by name to show they care about each student's input. Maybe each student will need to comment within a chat session as part of a lesson? Establishing chat times that are reasonable for all might not be possible. However, the comments can be saved and multiple chat times can be established.

Use of quizzes on blackboard before each session would ensure faculty knows what students know. Homework submission and exam proctoring will be very time consuming, but are just as needed as in face-to-face courses. Faculty must resist the possibility of converting all exams to only multiple choice to overcome some of the distance issues. If essay or computation questions are the best option for determining whether a student understands a concept, then ingenuity is needed to continue using the correct testing and homework processes. Working on course projects will require more thought and focus since the ability to interact face-to-face occasionally speeds up communication. Many companies are using video chats versus telephone or e-mail to improve communication. Maybe the course requires students to use Skype to ensure two students can set up a link as they are working on assignments and projects.

The use of technology will be required to be successful in distance education. However the appropriate use of technology to assist in student learning will be even more critical if a faculty member is to enhance student learning no matter the situation. The integration of varying software packages may make the process appear daunting, but with dedicated technical support, faculty can learn the necessary skills.

Why all of this focus on the ASCE ExCEED Teaching Model? Because it is proven to work and every student deserves the best learning environment possible. Keeping a eye on and dedicated application of the ASCE ExCEED Teaching Model should result in enhanced learning for each student using distance education.

### **3.0 Results**

In an attempt to understand the process of integrating the ASCE ExCEED Teaching Model into a distance education class, a faculty member randomly selected a class from their course and filmed the live session. The instructor then went ahead and prepared the same class as if it was being taught via distance education and recorded the same lesson content with Camtasia. The authors then evaluated both sessions to assess the effectiveness of the ASCE ExCEED Teaching Model within the distance educational model. The faculty member performing this exercise was very familiar with and adept at using the ASCE ExCEED Teaching Model within the classroom, but had never before put together a distance education class. Therefore, the results of this exercise truly represent the same types of challenges that any instructor would face integrating the ASCE ExCEED Teaching Model while developing distance education materials, especially for the first time.

#### **3.1 Video Taped Sessions**

The following description explains the material utilized for this lesson to help establish the context of the experimental lesson. This particular lesson was a continuation from the previous lesson, which covered moment reduction and types of anchor systems to be used in conjunction with anchored sheet piles. The instructor originally quickly reviewed the content from the previous lesson by displaying the last two board notes that had been presented with the document camera. The instructor then discussed several figures to help

clarify concepts from the previous lesson, again presenting these with the document camera. The final boards from the lesson were then presented in the traditional talk-and-chalk style. The second part of the class involved taking the students on a virtual field trip and introducing them to the next design technology, pile foundation systems, by showing them actual project pictures of the associated construction procedure. It should be noted that the students were slightly tentative about asking questions with a camera present in the room. However, the authors believe that students would not be as intimidated if the camera were routinely present.

The following comments represent some of the key faculty thoughts upon evaluating the video taped session. Note that most of the comments are positive in nature, since the instructor was fairly familiar with the ASCE ExCEED Teaching Model. However, it should be noted that the intention of these comments was to identify key pieces of the ASCE ExCEED Teaching Model that may be lost without appropriate effort within the distance education session.

Table 1. Faculty evaluation of live class using the ASCE ExCEED Teaching Model.

<b>ASCE ExCEED Teaching Model</b>	<b>Video-Taped Classes</b>
<b>Structured Organization</b>	
Based on Learning Objectives	Students were provided handouts at the beginning of class. Class had specific learning objectives.
Appropriate to the subject matter	Completion of previous lesson. Ensured that the students were on the right page of text.
Varied, to appeal to different learning styles	Both big picture and individual steps in solving the problem provided. Content stops were available throughout.
<b>Engaging Presentation</b>	
Clear written and verbal communication	Instructor demonstrates both written and verbal communication throughout. Color scheme is good. Generates lots of questions. Walks amongst students as virtual tour continues. Good questioning. Able to provide comments based on student comments and questions.
High degree of contact with students	Develops the board as material is discussed. Has controlled speed in presentation. Students asked a total of 26 pertinent questions during the virtual field trip.
Physical models and demonstrations	Using body action and hand gestures to show behavior. Pictures help students understand construction techniques and basic design principles.
<b>Enthusiasm</b>	Excitement for content in voice with voice modulation.
<b>Positive rapport with students</b>	Calling on students by name. Discussion on topics based on questions. Able to integrate humor into the delivery.
<b>Frequent assessment of student learning</b>	
Classroom assessment techniques	Questions to students. Questions at the end of each board before moving on. Wrap up at the end of class.

Out-of-classroom homework and projects	Quick discussion on what was due and when.
<b>Appropriate use of technology</b>	Virtual tour with technology. Colors. Multiple use of technology at the same time (document camera, white board, text book, handouts, etc.). Being able to point with pen and gesture.
Teacher as a Positive Role Model	Theory and problem solving developed in front of students.

### 3.2 Distance Education Sessions

For the distance education session, the instructor took the same lesson content that was presented in the live video-taped session and prepared it as if it were being presented via distance education. Several different attempts were made, exploring different techniques for each approach. These included presenting board note content and pictures via PowerPoint with only voice over, teaching at a white board in the office with no students present while capturing video directly to Camtasia, and presenting pictures and other material in PowerPoint while also capturing web camera video of instructor. This section identifies the results of these different trials.

For the first attempt at utilizing distance education software, the instructor only used voice over PowerPoint and screen capture, yet still spent a couple of additional hours in formatting PowerPoint, figures, etc. The authors knew that there would be key pieces of the ASCE ExCEED Teaching Model that might be lost with only the voice over exercise (as discussed below), but felt that this exercise was warranted to represent how many faculty choose to perform distance education material.

Table 2. Faculty evaluation of distance education class with voice over only using the ASCE ExCEED Teaching Model.

<b>ASCE ExCEED Teaching Model</b>	<b>Distance Education Classes</b>
<b>Structured Organization</b>	
Based on Learning Objectives	The instructor attempted to place a roadmap at the first of the presentation, but did not refer to the objectives again.
Appropriate to the subject matter	Student experiences cannot be drawn upon. Likewise not utilizing the students to help develop the content. Scripted questions would have been more effective. Need multiple copies of scanned sections so that the presentation doesn't jump back and forth. Must rely on stating everything since students do not have a chance to ask questions if confused.
Varied, to appeal to different learning styles	Virtual field trip provided a global overview of technology, while stepwise construction sequence showed the development of process.
<b>Engaging Presentation</b>	
Clear written and verbal communication	Used cursor to point, but too small to see effectively. Scan of handwriting needs to be clear and clean. Nothing

	remains visible once the screen has progressed to the next board, picture, etc. Ensure that figures are large enough for students to see. Presentation screen is very small.
High degree of contact with students	Essentially no contact with students during this presentation. It was clear that the instructor had been speaking to a microphone. Not able to ensure that students are in the correct location in the textbook.
Physical models and demonstrations	Figures were a bright spot. Still able to utilize the pictures as teaching aids. No other physical models used during this presentation. Lots of times discussing specific parts of the textbook, but no slide of textbook in front of students.
<b>Enthusiasm</b>	Monotonic, no real passion in voice. Very little energy or modulation in voice. It was clear that the presentation was unscripted and that actually helped the flow seem a little more engaging.
<b>Positive rapport with students</b>	None
<b>Frequent assessment of student learning</b>	
Classroom assessment techniques	None
Out-of-classroom homework and projects	Students were not reminded of homework assignment due.
<b>Appropriate use of technology</b>	Minimal media sources utilized. Everything was built into either PowerPoint or screen capture. It wasn't always clear where on the figure the instructor was describing.
Teacher as a Positive Role Model	Not able to see instructor without talking head.

For the second attempt at utilizing distance education software, the instructor used the HD web camera to capture the instructor teaching at a single white board in the office with no students present. The camera was set up and angled to capture both the instructor and the white board as content was developed. This attempt also used PowerPoint to present the virtual slide show, but for this attempt the instructor also used the web camera to capture video of the instructor explaining the figures. The HD web camera was set on a tripod or mounted to the computer monitor during presentation. The instructor had to ensure that the camera was providing the appropriate field of vision. As this was the second attempt, several key items discovered during the first attempt were integrated into this trial to test the effectiveness of those lessons learned.

Table 3. Faculty evaluation of distance education class capturing web camera video using the ASCE ExCEED Teaching Model.

<b>ASCE ExCEED Teaching Model</b>	<b>Distance Education Classes</b>
<b>Structured Organization</b>	
Based on Learning	Since learning objectives aren't readily available on the

Objectives	board, instructor needs to make a concerted effort to refer to them often. Handout sheets with learning objectives given to the students prior to the class enhances this process.
Appropriate to the subject matter	Similar difficulty as previously identified. Student experiences simply cannot be drawn upon, nor can the students be used to help develop the content. Since material is not readily available once the board is cleared, it may a good idea to number the boards for reference during the course of the lesson. As an example “you will recall that on Board #2 we defined...” etc. Lesson preparation is critical to making this work. This will require a stand alone PP and board captures that students can print out before the lesson.
Varied, to appeal to different learning styles	Virtual field trip provided a global overview of technology, while stepwise construction sequence showed the development of process.
<b>Engaging Presentation</b>	
Clear written and verbal communication	Rather than using the cursor to point, the instructor used the built in drawing tools within PowerPoint. These include prebuilt shapes, arrows, text etc., but also utilizing the presentation pointer options. Right clicking on the screen during the presentation and selecting the “pointer options” tool allows the presenter to write over the screen with a number of different pen options and colors. There are also key commands (‘ctrl P’ changes to pen, ‘e’ erases, and ‘ctrl A’ changes back to arrow) that allow the presenter to highlight things spur of the moment during a presentation. This was much more effective than simply using the pointer to mouse over things.
High degree of contact with students	As before, there is no direct contact with students during this presentation. However, speaking at a camera (and looking at the camera often) made it feel as if the instructor was making contact. The use of the web camera video both facilitated the instructor’s ability to teach more effectively and provided a medium for the students to feel connected to the instructor during the lesson. It should be noted that for this attempt the instructor stood during the presentation, using a presentation remote and used hand gestures just as if teaching in front of a live class.
Physical models and demonstrations	Showing pictures is very conducive to this technique.
<b>Enthusiasm</b>	Capturing web camera video made it much easier for the instructor to not get caught up in a monotonic presentation. Although hand actions are acceptable, the instructors feet need to remain planted in one spot since



	the web camera was not set to follow the instructor.
<b>Positive rapport with students</b>	None
<b>Frequent assessment of student learning</b>	
Classroom assessment techniques	The instructor did not do any. Requires preparation and thought to make this work.
Out-of-classroom homework and projects	Time must be devoted to informing students about out of classroom expectations.
<b>Appropriate use of technology</b>	The web camera adds a tremendous dimension to the presentation. Having both the PP and the talking head on the screen was much more appealing to watch. It may be wise to shift all content to the left or right side of the screen when using PowerPoint so that there is room for the video without covering content or having to shift the video of instructor from slide to slide. Using the builds and presentation pen function made it much easier to follow what the instructor was referring to the screen.
Teacher as a Positive Role Model	Seeing the instructor on the screen allows the instructor to “be there” as a positive role model.

#### 4.0 Lessons Learned

After performing the exercise of exploring the preparation of distance education lessons as if for a real class, the authors have prepared a list of the key lessons learned for applying the ASCE ExCEED Teaching Model to distance education.

Table 4. Summary of key lessons learned for integration of ASCE ExCEED Teaching Model into distance education classes

<b>ASCE ExCEED Teaching Model</b>	<b>Face to Face Class</b>	<b>Distance Education Class</b>
<b>Structured Organization</b>		
Based on learning objectives	Instructor often has posted in classroom during lesson. Also includes a daily handout sheet with lesson objectives.	Need to be presented clearly at the beginning, referred to throughout, and summarized at the end of the lesson.
Appropriate to the subject matter	Multiple mediums available to present subject matter, and easy to switch between. Simply a matter of preparation.	Takes much more time to organize lesson materials. Pictures have to be scanned in, sized, and builds help the flow of subject matter. This takes much preparation time.
Varied, to appeal to	Instructors have to	Visual-Verbal: Instructors need to

different learning styles	think through and include learning moments for different learning styles.	continue to use appropriate presentation including charts, figures, pictures, etc. and appropriate explanation. Active-Reflective: Instructors need to not be afraid of providing appropriate pauses, allowing time for students to think and work on in-class problems. Sequential-Global: Students can only see what is being presented at that moment in time. Instructors need to think through repetition and make an effort to appropriately refer back to previous content.
<b>Engaging Presentation</b>		
Clear written and verbal communication	Board work allows students to follow along, learning while they take notes.	Writing board notes on an actual white board or on a tablet, will allow students to stay more focused while taking notes and makes it feel as if the content is being developed for them as opposed to seeing the text simply pop up on the screen. No chance for students to catch misstatements and ask questions in class to clarify.
High degree of contact with students	Easy to walk amongst students. Call on students by name.	Much more difficult with continuing education. There is no reason why the students can't still be referred to by name. It may take a little bit more planning and effort, but can still be done. Pose the question, call on students by name. Other ways of acknowledging that the students are still there such as reminding them to take notes, providing homework and exam hints, covering assignment due dates, etc. Using voice over only is not nearly as effective as using captured video of the instructor. The captured video should be used as much as possible, and can be integrated into the presentation with the picture in picture function.
Physical models and demonstrations	Easily brought into the classroom. Should be large enough to see and	Video clips and pictures are very easy to utilize. Using the mouse cursor is not as effective as a laser pointer, and

	simple enough to convey a clear message.	it may be better to highlight specific areas with built in arrows, circles, etc. The presentation pen function is also an effective tool. Any physical model that can be used within the classroom should also be used for distance education, simply by filming the presentation – must remember limited camera focal length.
<b>Enthusiasm</b>	Body language, voice fluctuation, and energy all convey enthusiasm.	This is very difficult to do at first for continuing education. It is very easy to get caught up in a monotonic presentation. Energy in voice dropping as lesson continued. Lowering the microphone away from the mouth and having to speak louder as if in a classroom will help. Don't sit in the desk chair and hold the computer mouse. Rather stand and utilize hand motions and gestures as if presenting to a live class. Have to almost be over the top to convey passion. Filming the instructor and having the talking head in the corner of the screen should change the presentation style dramatically. Keep your feet planted in place when filming unless you have a camera that will follow your movement.
<b>Positive Rapport with Students</b>	Easier to do when you actually see and get to know the students.	Need to make a concerted effort to get to know the students. Video conferencing and voice chat rooms are much more conducive than simply conversing via email and written chat. Utilizing student names whenever possible, especially during content delivery as appropriate, is important.
<b>Frequent assessment of student learning</b>		
Classroom assessment techniques	A variety of options available, from questioning techniques to quizzes.	Takes a little more effort. In many instances may be self assessment. Having the software require the students to submit an answer (similar to using clickers in the classroom) prior to continuing the presentation

		would be a valuable tool. Use scripted questions to ensure more critical thought. Students could also be given periodic quizzes with a pause in the presentation, to have them perform self assessment of content presented.
Out of classroom homework and projects	Regular homework and feedback provided. Group work option readily available.	This should be treated just as it would be in a face-to-face class. Students should submit work regularly and receive timely feedback. May involve scanning and emailing homework back and forth. Some of the group dynamic of homework assignments and projects is lost, but may still be doable through networking communication.
<b>Appropriate use of technology</b>	Multiple sources available. Easy to switch back and forth between document camera, whiteboard, textbook, etc. Can have multiple sources open at one time.	Takes more effort to transition back and forth between different options. Figures have to be scanned ahead of time. Writing on a tablet is much more interactive than PowerPoint. Teaching at a white board should not be completely abandoned and may provide some instructors with a more comfortable presentation medium. Instructors should avoid talking to the textbook.
<b>Teacher as a positive role model</b>	Demonstrating in front of students is easy.	Continue to use personal stories and experiences.

## 5.0 Conclusion

It is very difficult to present content via distance education as effectively as in a face-to-face setting. Much of this is simply the result of the lack of direct instructor to student interaction. With distance education becoming more common, it is imperative that instructors still look for ways to integrate effective teaching methodologies into their content delivery. After performing this exercise, the authors are confident that there are a number of ways that the ASCE ExCEED Teaching Model can be incorporated into distance education courses. The thought process is a little different and it takes just as much effort, if not more, to ensure that effective teaching is taking place. By incorporating the lessons learned in this paper, instructors will be able to elevate the learning effectiveness in their distance education courses.

Several different presentation techniques have been explored for this paper for integrating the ASCE ExCEED Teaching Model within distance education. The authors acknowledge that this list is clearly not inclusive of all different techniques that may be available. However, the authors chose to use those techniques that were thought to be fairly simple

to implement and the types of techniques that an instructor would first attempt when new to developing continuing education courses. The thoughts and lessons learned from this exercise could readily apply to any number of continuing education presentation methods though. The authors are particularly interested in continuing to explore the option of using a writing tablet as a means of developing board note content for a continuing education lesson, but at the time of writing this paper have not yet proceeded down that path. The authors anticipate that this technology may be readily available for integrating the ASCE ExCEED Teaching Model during the presentation, but that the lessons learned in this paper should also be incorporated. The authors further note that with any of these technologies, instructors should not expect to achieve presentation mastery overnight. Just as learning to teach a live class for the first time, it will take time, patience, careful planning, and a concerted effort to ensure that distance education lessons are taught with the energy, appeal, and organization that the principles within the ASCE ExCEED Teaching Model provides.

There are no on-line courses being offered this semester within the department. No students chose to take the Statics course on-line – all opted to take the face-to-face version. What does their action say? The students may want distance education, but they appear to know the quality of distance education has not been very good. The CE program at UT Tyler is working very hard to change this perception.

Once faculty are fully comfortable with developing distance education lessons while applying the ASCE ExCEED Teaching Model, the team will be ready to apply their procedures and skills to the laboratory environment.

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