Distance Learning Experience in a Construction Engineering Program

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Case study of a Distance Learning Experience on Construction Technology Program

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ABSTRACT

Distance Learning is a priority in the engineering technology division at Florida A&M University. The division is equipped with the long distance learning facilities for application in the current and the new developing programs. A case of a long distance student is presented. She graduated from the construction engineering technology program after she found the opportunity to continue her studies more than a decade after leaving the school. This was achieved with the flexibility of the distance education. This presentation demonstrates the experience of an instructor, and a distance student in the construction engineering technology program as well as the division vision. The program has the capability of live and recorded distance education. The recorded class videos allowed the student to review the class lectures. This was a significant possibility for the student who worked full time in the related construction jobs off campus. However, her job place allowed her live online attendance in classes, and exams.

Senior construction engineering technology courses were taught using the distance learning. The educator used PowerPoint and the white board conventional learning as well as the document camera for the lecture. The course material was posted on Blackboard. The student contacted the educator using emails and phone calls. The courses assessed by assignments, quizzes, projects, and exams. A presentation of the long distance student about her construction experience was memorable for the class students. The continuous support of the university Information Technology services was the key to the successful offering of the courses.
This presentation describes how the instructor, program director and student facilitated the distance learning. The advantages and defects, and suggestions are overviewed.

1. Introduction

The environment of distance learning education is in contrast to traditional educational settings. As the students are not physically present in classroom, they may lack participation, feedback and support by their classmates and instructors, thus leading to less commitment in learning (Tuckman, 2007). When designing an online course, there are three organizational categories to consider: course structure, course contents, and artifacts of learning. It might also be informative to look at the organization of the major subdivision of a typical online course: the course unit. (Simonson et al. 2009) Bates and Khasawneh (2007) suggested that better computer self-efficacy results to more dedication to online learning and more engagement in the learning processes. Other researchers found similar results that multimedia and discussion boards may improve student online learning (Chen et al, 1999; Guzley et al, 2001; Kanuka, 2005). Educators should identify students who are taking online courses for the first time and provide necessary technical help in order to ease their anxieties and increase their emotional encouragement levels. They also need to apply strategies that will increase their ability to self-regulate their learning in distance education environments. (Sun and Rueda, 2012)

This presentation provides a successful case study of a long distance student, educated and graduated from the construction engineering technology program after more than a decade of leaving the school. She followed her studies using the flexibility of the distance education. She was guided and motivated to follow her studies by the Hybrid and recorded capabilities available in the school. The courses were 3 credit senior courses including reinforced concrete design 1 and 2 and soil mechanics and two one credit courses. The paper also reviews some of the distance learning facilities and experiences in the engineering technology programs at FAMU. The facilities were designed such that they provide several resources for the distance education. The success was outcome of the online facilities and continuous communication and motivation of the off campus
student. The capability to attend the class on line and live, and other available tools collaborated the distance education.

The graduated student provides her opinion on this method as short videos, which will be presented in the time of the lecture.

2. The Facilities and equipment

The engineering technology division at FAMU is equipped with the long distance learning facilities as it was presumed as a priority. The purpose of these facilities was to enable the program for distance learning both online, and hybrid. The lectures can be presented for students attending a class at campus, and those who simultaneously connected online off campus. It can be recorded for the student review of the lecture and material after the class time. Additionally, the equipments are intended to use for teaching purpose of the instructors who taught off campus, particularly for future planned programs including the Master of Construction management and Engineering Technology program, which is planned to start in Fall 2017.

The class is equipped with the distance learning facilities. The online and recording capability is arranged, controlled, and supported by the university Information Technology Services office.

The room smart podium is controlled via Cisco based computer and controlling system. It includes the system managing smart software, a video projector, a front camera, a rear camera, and two TV monitors, one is in front of the students and behind the instructor, and another one can be seen by the instructor. The facility is equipped in the classroom, and can be controlled by the instructor through the smart podium computer. The room facilities, cameras, and sound can be controlled. The Information Technology Services Office, can have access and control the facilities, in cases a problem is faced by the instructor or for distance learning facilities training purposes.

A schematic model of the facilities application is summarized in figure 1.
The system not only allows the instructor to use the normal presentations on the screen, but it permits distance conference meetings. It is also possible that an instructor or a lecturer presents a session or the entire course off campus, while the students are attending in campus and off campus, with a teaching assistant who controls the facilities and connection before the start of the class. A picture of the room facilities, students and presenter in a company seminar is shown in figure 2.

Fig. 1. A schematic model of the distance learning facilities and application

2.1. Common classroom presentation tools
The software allows the conventional screen views that are normally used in face-to-face conventional classes in campus. These view options are listed below:

(a) *The smart podium computer*: For instance, the PowerPoint slides and YouTube videos, Microsoft or other software outcomes can be presented (Figure 3).

(b) *Document camera*: Documents and other object can be magnified and presented. Calculations on paper or graph presentations can be presented live.

(c) *Laptop or other input*: other inputs from a laptop, tablet, or other can be presented.

(d) *DVD*

(e) The traditional white board (Figure 4).

Fig. 2. The room facilities, students and presenter in a company seminar
2.3. Other Communication facilities

The university policy mandates such communications to be under the management and control of the office of Information Technology Services. Recording, live class or distance conference meeting communication need to be prescheduled and arranged by that office. The authors practice proved the university support was superb. The possible options are listed below:

- Presentation for off campus individual
- Presentation of off campus individual in campus
- Simultaneous Conference meeting of one or several off campus individuals with the Instructor or the students in class and communication between them
- Recording all of the above functions such as a class, an online meeting, or a presentation presented by a person inside or outside of campus.
For live communication, Jabber software system is used. The faculty have been trained to use the system, and the university ITS office resolves any problem if occurs. Jabber provides a two-way communication to the room audience or the instructor in the room. The authors experienced the following conditions successfully.

3. **The distance learning facilities which were successfully applied in the classes**

The facilities will be explained here, and will be presented in the conference with additional photos and figures in conference presentation.

3.1. **Jabber**

a. Live access of the distance-learning student to the class lecture

The student had live access to the course lecture. It was possible using Jabber software access.

The student could watch live the class lecture, ask questions, and communicate with the educator and class, and follow the class course materials. The instructor could control the camera zoom and moving capabilities, and changing the views for the class by the use of the smart podium system that was copied by Jabber view online. The current practice suggests using the system for either record of the class and the online live jabber connections and insuring that the proper zoom of the rear camera and the sound needs to be checked prior to the start of each class lecture, such that the podium, the board, and alternatively the screen could be watched perfectly by the distance-learning student. Thus, the recording and the live view included the board, the screen and the podium without the need for checking the sound or the view during a class session.

In such manner, the educator do not need to be distracted or worried about the change of the view for the computer, board or document camera during the class periods. The educator just follows the class as normal face-to-face lecture that results to a more convenient situation for the instructor and students.

In particular occasions, the online student was asked to communicate with the in campus class students. In one occasion, she presented her project for the class students and answered their questions. A presentation of the long distance student was a memorable
experience for the class students, as she was assigned to present about her construction job experience, professional ethics, and her suggestions for their job search. That was a very attractive session for the in campus students, as the communication was possible such that she could see the class students with the front camera, and they could see her face and her presentation on the screen. The adjustments have been prepared before the class for such communication.

The above consideration created a possibility of being present in the class, while she was not physically present in school. That resulted a close and live contact possibility for the distance learning student and the class.

b. Live teaching access of the off campus instructor

As the off campus student presentation was practiced, this capability was applied for a teaching condition, such that an adjunct educator taught course material, when she was off campus for few weeks (Fig.5). This could be considered as a prototype pilot test for the engineering technology division to be used particularly in future proposed programs such as the Master of Science of Construction Management and Engineering Technology at FAMU. That assured this capability in future programs, while the educator did not attend the class, or for the condition of an invited lecturer she/he could present the students. The Jabber enabled the educator to see the class students, while she was off campus. She needed to assure the class equipment are installed and needed an assistance person in the class to prepare few minutes before the class. In such pilot test case, the faculty authors associated, but it could be ensured by hiring a teaching assistant student who starts each class and checks the connection few minutes prior to the start of the class, and attends the class to assure the adequacy of the class equipment and connection during the class periods.
3.2. Record classes
As the distance learning student worked full time, it was particular occasions that she could not attend the class and use the Jabber connection live. The recorded videos allowed her to review the class lectures. That capability is for the off campus and online students. The class recording helps them to review the class material, contact their instructor and follow the courses without noticeable delay when they are absent. The attended students can review or repeat the recording to understand better the concepts and class materials and problems.

3.3. Blackboard access
FAMU provides Blackboard access for the students as other universities with similar online access. The instructor prepared lecture slides, class problems, assignments, solutions, grades, announcements, and other course material in blackboard, such that the student had access to the course documents for study and practice.

3.4. Email and call
The other communication methods were obviously email and phone call. The student received the guidance, question answers and other necessary critical hints. She sent her assignment solutions via email. Her job supervisor, who undertook and guaranteed the assigned proctoring regulations, received the exams, printed them and proctored the exams and sent the educator the exam picture files after the exams.
4. Teaching method

The class was Hybrid such that it was recorded and presented for the long distance student, while other students attended the class. The instructor style was such that he used PowerPoint slides and the class white board presentation for the concept section of the lecture. Additional explanations and class problems were solved in the class using the white board and document camera. All of the class could be watched for the long distance student both live and recorded. The course material was posted on Blackboard. The student contacted the educator using emails and phone calls. The courses assessed by assignments, quizzes, projects, and exams. A presentation of the long distance student was a memorable experience for the class students as was explained in section 3.1.

5. Arguments about the current method

- A survey was checked the opinion of five of the other educators who have not taught this distant learning method before. They did not feel comfortable about the fact that their courses would be recorded if they present this distance learning method. Their reason was that the class conditions are unpredictable while the students attend the class. The challenges are different from the recording without the students in class, and can be far from the ideal condition that the professor records his presentation without audience.

- Another problem about the live access is the fact that the technology may result to delays. In one occasion, the arrangements could not be prepared in the half an hour that the off campus instructor continuously contacted the university ITS office, and the assisting educator in campus. They end up using another online access method, which its quality was less for that day. The reason was found to be the fact that the Jabber should be updated for the university. It was a good reminder that the entire connection should be checked between the off campus individuals and the class, few days before the first session, such that the problems could be diagnosed and resolved before the actual first session.
• The above problem, can always be an issue for the technical connections when something is going wrong, that can be the internet connection, equipment problems and possible campus software temporary defects or problems.
• Another very important matter is the motivation of the student who does not attend the school. Projects, presentations, and ordinary checking of the student questions, and the assignments are just some of the methods of improving of the student’s involvement in the class, but the argument can be discussed more for future.
• The professors need to have proper motivation for hybrid classes. The distance-learning students add to the pressure of the teaching in the time of the class and after that.

6. Conclusion

The entire presented distance-learning process can be considered as a positive outcome. There division of engineering technology at FAMU is equipped with the distance learning facilities. This experience of teaching senior courses was successful. The conference presentation explains how the distance learning student, other students, the instructor and the program director faced the challenge, its advantages and defects, and the suggestions for future.
In addition to the faculty, the graduated student who practiced it has provided short videos of her experience, which will be presented in ASEE conference.
The continuous support of the university Information Technology Services was the key to the successful offering of the courses.

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