

## **Expectations of On-campus and Remote Students in a Course in Civil Engineering Technology**

**V. W. Lewis, Jr.  
Old Dominion University**

### Abstract

Old Dominion University has developed an extensive distance learning system (Teletechnet) which includes over 21 remote community college sites and a total of 13 hospital, military and industrial sites. The course which instigated this paper is a course in Plans and Specifications. This course was taught on campus in its current format in the spring semesters of 1994 and 1995 and received favorable student evaluations. The first semester in which the course was taught on Teletechnet was the spring of 1996. The evaluations of the on-campus students were much higher than those of the off campus students. It was found that the professional interests and experiences of the remote students resulted in their not being sufficiently challenged or insufficiently motivated to work in an area not directly related to their interests. It was determined that the course content should be discussed in greater detail at the start of the course and that the students should be clearly advised that their professional or academic experience may permit them to challenge the course and receive credit by examination.

### Introduction

Old Dominion University has developed an extensive distance learning system called Teletechnet which utilizes interactive, real time video. At the current time the Teletechnet system in the Commonwealth of Virginia includes three local sites which are considered part of the local Old Dominion University campus, over 21 remote community college sites and a total of 13 hospital, military and industrial sites throughout the state. A program is under way for the expansion of Teletechnet to serve other regions out of Virginia. In addition to Engineering Technology, areas of study include Engineering Management, Nursing, Education, Criminal Justice, Business Administration, Communications and Human Services. At each site, a Director is provided by Old Dominion University to assure proper advising and functioning of the program at the sites.

As the number of courses being offered via distance learning are expanded, consideration must be given to the continued development of these courses to ensure the proper learning experience for both on campus and remote students. The course which is the subject of this paper is a three semester hour course in the preparation of Plans and Specifications. The focus of the course is in two areas. The first is a study of the items that must be included in a set of plans, the methods of presenting the information and the order in which they should be presented. The second is a study of the principals and organization of a set of specifications, including the writing of specifications and the editing of standard specifications. Our CET program considers this class essential in order for our students to be able to produce competent plans and specifications as soon as possible following graduation. In our opinion, the best way to convey this technology is to have the students prepare a set of plans and specifications in a project format as part of the

course. The emphasis is not on the drafting work, although there is a significant effort required in this area. Rather, the emphasis is on a determination of what information needs to be shown or specified and the best methods to achieve this goal.

### Student Evaluations

This course was first taught by this instructor on the Norfolk, Virginia campus in the spring semesters of 1994 and 1995 and received favorable student evaluations. Beginning in 1996, the course was taught on Teletechnet and will continue in alternating years with a section enrolling only on-campus students being offered in the other years. The student evaluations for the course in 1994 and 1995 were 4.5 in 1994 and 4.6 in 1995 on a six point scale (good to very good). Written comments from students were favorable for both classes.

The first semester in which the course was taught on Teletechnet was the spring of 1996. For the purpose of this paper, the students are placed into two groups. There were 15 students in the television studio/classroom on campus and a total of 52 off-campus (remote) students at ten remote sites. The written and numerical evaluations of the two student groups for this class varied noticeably. The on-campus students evaluated the course favorably with a rating of 5.3 on a six point scale (very good to excellent). The off-campus students did not evaluate the course as favorably, with a rating of 3.6 (acceptable to good). In addition to the numerical ratings, the written comments from the on-campus students were more favorable than those from the remote students. The following are representative of the six written comments from the on-campus students:

*This class has been a valuable learning experience  
Prof. Lewis has allowed my experience in plan development (to) greatly  
increase. I have thoroughly enjoyed the class.*

The following are representative of the eight off-campus written comments:

*Name should change to DRFT 101*

*I feel that this course was not near as effective as it could have and should have been. A 300 level engineering class was turned into a 200 level drafting and CAD class. This class could have been far more effective by letting the students develop their own project. Allowing the students to do their own design, design considerations, choose building components, and make decisions for their own on details would have proven to be far more effective than simply drawing or re-drawing what the instructor has given us. A simple drafting class would cover this.*

It was noted that there were relatively fewer written comments from the remote locations than from the on-campus group. Considering that the remote students were located in 10 locations, the majority of the written comments may reflect the opinions of students at only one or two of the locations. The written comments are not identified by campus or author in keeping with the university's privacy policy.

## Differences in Student Demographics At the Various Sites

At the beginning of the class, all students were requested to provide information which would enable the faculty to contact them in order to answer questions and provide information by telephone as necessary. This information is not requested as a university policy, but is commonly done by this professor in all of his classes. In addition to the above, the students were also requested to indicate if they were employed and the nature of the employment.

Based on this information, and conversations with the students in the course of the class, it was determined that the majority of the students at the remote sites were employed full time by federal or state governments or a variety of professional or commercial firms. Most of the students which were not employed at the time of the class had at least some experience of this nature. Many of the students were older and had started a career, even if in a sub-professional area. In contrast, the local students were mostly full-time, generally younger, and most had little if any experience in the field. It should be noted that some of the on-campus students were employed, but in most instances the employment was not in a field related to Engineering Technology.

## Action Taken to Resolve the Disparity in Student Response

Action is being taken in several areas to make the class better suited for distance learning students. It is important to note at this point that it may not be possible to meet the needs and desires of all students. Even in an entirely on-campus environment, the students have a variety of experiences upon which they draw, although it is believed that the experiences are not as varied as those in a multi-site distance environment. Often our remote students have graduated from two year programs which provide a variety of experiences, some of which may meet the requirements for this course.

It is also appropriate to note that the program requirements must be set by Old Dominion University in response to the needs of the field which they serve, rather than the goals and interests of the individual students. Obviously the student who commented that a course in plans and specifications should require the students to do all of the design for the project was focused on design, rather than a study of the requirements of plans and specifications.

It is our opinion that the objectives of the course can be met with a study of any design discipline. However, the manner in which a given discipline effects these principles in the students' work may vary. In our opinion, an orderly discussion of the principles of good plans and specifications necessitates that all student projects be of the same discipline. Since the focus of our program is in the architectural engineering area, a project in this area is required. It is our intent to allow the students to pursue a course of their own choosing as long as it meets the requirements of the course.

In the spring semester of 1997, the on-campus section of the course will be allowed to pursue this option. (The course will be offered via Teletechnet again in the spring of 1998.) This change

required an extensively detailed list of requirements for the project which allows the students to express their creativity within the specified limits. At the time of the writing of this paper, it appears that this change has been well received.

In order to present the course objectives more directly to the distance learning students, an announcement will be posted at each site during the semester preceding the start of the course that clearly outlines the course objectives and requirements. The students will also be encouraged to investigate the option of challenging the course and obtaining credit by examination. The implementation of this option must be done advisedly, since an examination which adequately evaluates a student's proficiency in this area may be difficult to configure.

The course objectives and pedagogy must be clearly presented to the students at the first class meeting. In the case of the Spring 1996 class, this was attempted although the evaluations made at the end of the course did not indicate that this information was understood at the remote sites. One of the advantages of distance learning is that tape recordings of each class are retained at the broadcast site which can verify that certain topics are covered. Such documentation makes it difficult for the student to argue that they were not informed.

At some of the sites the standard procedure is for students to enroll the day of the first class. In the 1996 course, several students did not enroll until the second class and may not have received this information, although a tape recording is also retained at the remote sites for viewing by students who are absent or enroll late. It is therefore essential that the instructor present this information in at least the first two sessions.

#### Credit by Examination

It is suggested that two methods of implementing credit by examination by credit be considered. The first involves independent confirmation that the person in question has demonstrated the knowledge required for the course. This confirmation must be made by two or preferably three previous employers or professional colleagues or knowledgeable faculty at a prior institution. It is considered preferable that the employer's representative be an immediate supervisor, since a person in this capacity is best qualified to know the qualifications of the student. For confirmation to be made by a colleague to be acceptable, the colleague should be a registered professional, since that status inherently creates the desired credibility.

The persons identified by the student should be contacted directly to confirm their willingness to participate in the process. If the individuals are willing to participate, a carefully worded questionnaire should be sent to each which addresses the specific areas in question. It is our position that the student does not have to demonstrate knowledge in every specific area of concern, but have a general knowledge which will permit the student to proceed with future project-based course work.

The second option is to prepare an examination for the student which is administered by Old Dominion University through the appropriate site director. This is a reasonably straight forward task for a subject such as specifications, but the examination for the plans part of the course presents an unusual challenge. It is considered essential that the student demonstrate how he

would organize a set of plans and what information he would include. After careful consideration, prototype examinations have been employed with on-campus students which gives an extensive verbal description of a project. The student is then required to sketch the plans and details to be included. This procedure requires more effort than a typical three hour examination, but no alternate verbal or written assignment was found that could adequately demonstrate the knowledge required. As in the first option, it was not considered essential that the student's work match the exact style or format usually seen by the instructor in his previous professional activities, but the student's work must indicate a minimum level of competence.

### Conclusion

It is acknowledged that a course such as one in plans and specifications requires a somewhat different approach from many typical courses. It is the opinion of our program that competence in the preparation of plans and specifications is essential for CET students to perform successfully without extensive on-the-job training following graduation. Unfortunately, based on this professor's professional experience, a lack of competence in this and other project related tasks is common in new graduates.

If a student possesses the desired competence in this topic, it is our position that the student should not be denied credit for prior experience provided that this competence can be adequately documented. A course in plans and specifications requires careful planning in consideration of the many approaches seen in the profession. There are however, particular types of information that must be provided in a set of plans and specifications regardless of the techniques used to relate the information. Due to the variable nature of the techniques used, confusion and criticism may arise, especially in a student body with prior professional exposure. If the goals of the course are carefully stated at the onset, it is feasible to provide a course that is challenging and appealing to the majority of the student body. The continued development of all courses taught via interactive television or other distance learning methods is essential to meet the needs of the program and its diversified student body.

VERNON W. LEWIS, JR. P.E. joined the faculty of Old Dominion University as an assistant professor in January, 1994. In addition he has 25 years of professional experience in consulting, Industry and forensic engineering and is registered in nine states. His areas of expertise include structural design, contract documents and materials testing.