AC 2008-2647: EFFECTIVE EXECUTION OF SURVEYING LABORATORIES IN DISTANCE LEARNING USING LOCAL MENTORS

Vernon Lewis, Old Dominion University

Effective Execution of Surveying laboratories in Distance Learning Using Local Mentors

Vernon W. Lewis, Jr., John Rand Old Dominion University Norfolk, Virginia

Abstract

Surveying courses with laboratories are a curricular requirement of the Civil Engineering Technology Program (CET) since its inception. This course was taught traditionally as an on-campus class. Over the last ten years, the CET Surveying program has expanded to contain an extensive distance learning component, with at least half of the enrollment located off campus. The model for the typical distance-learning class is to meet for three hours, once a week, with a fully interactive (voice) live class. Laboratories for distance learning programs require resourceful planning. The distant students in the past traveled to the local campus for a weekend laboratory, but with the increased growth of the program, many students are located in other states, making travel for the weekend laboratories difficult.

In consideration of the demand of a growing distance learning system, it was decided to make the laboratory available to the remote students through the use of a local mentor. This paper will outline the preparation of the laboratory guide, the qualifications of the mentors, the success in locating mentors by students and a comparison of the local and mentored remote students' achievement of course objectives.

Introduction

A student aspiring to enter the surveying profession today faces a difficult dilemma regarding a four year college education. This dilemma revolves around the following factors¹:

- 1) There are a very limited number of universities in the United States offering a four year Bachelor of Science in a surveying curriculum;
- 2) There is a small numbers of surveying Bachelor of Science candidates to support development of surveying programs as compared to other curriculum areas;
- The limited number of surveying Bachelor of Science candidates are geographically dispersed;
- 4) The demographics of the candidates who are often older students already working and settled in a locale.

Real-time distance education technologies, such as satellite video and internet streaming, are viable means of extending the reach of a limited faculty to such a dispersed audience. Old Dominion University (ODU) has a curriculum, faculty and distance education technology infrastructure which has been utilized to develop a robust distance-deliverable Bachelor of Science in surveying. Indeed, all of the upper-division coursework is available via the ODU TELETECHNET distance education system.

A significant issue with distance delivery of a surveying curriculum concerned the accommodation of field labs. Having all of the students travel to the campus for a 'minicamp' proved to be unreasonable as the system expanded beyond Virginia and North Carolina. It was decided to make the laboratory available to the remote students through the use of a local mentor.

The first surveying course to be transmitted to a location distant from Old Dominion University occurred in Fall 1997. Since then, the entire suite of surveying courses offered by ODU has been converted to the distance delivery mode. The distance education classes offered by Old Dominion University (ODU) in Norfolk, Virginia, are transmitted via the ODU distance learning infrastructure known as 'TELETECHNET'. This system connects satellite and internet video streaming content to a network of ODU satellite sites, Community colleges, military bases and the Internet. Early on it was recognized that the use of mentors to the students at the sites remote from ODU would have to be implemented to compensate for the inability to fund the equipment and staff for laboratory classes at each remote site.

Mentors

What is a Mentor?

The surveying laboratory mentor provides a structured educational environment equivalent or superior to the on-campus capacity. It is one component of the academic experience intended to provide mastery of fundamental field surveying and computational skills.

Mentor Qualifications

The primary qualifications desired of a mentor are that they be a licensed land surveyor, an active member of a state Association of Surveyors, be located within a reasonable geographic proximity to the distance student's locale, and be willing to make the requisite time and resources available to the student. In addition, there are a variety of other services the mentor can provide to the student.

Licensure is desired because it indicates that the mentoring individual has successful displayed the knowledge required to perform surveying work at a professional level. Licensure in good standing is also an indication of integrity and ethical behavior in the conduct of business. Active participation in the state association is an indication of the individual's exposure and relationship to the profession's mission, philosophy and goals.

It is essential that the mentor be willing to make their, and/or their staff's, time and equipment resources available to the student. This can consist of conducting lab activities in or near the office, or permitting the student to accompany and participate in field work by the performed by the surveyor or staff.

There are also some less tangible qualifications desirable. The mentor is in an excellent position to serve as an intermediary for self-discovery and development of personal and career skills of the student. The mentor can expand the student's career horizons and assist in obtaining employment. At least one student each semester is hired by a mentoring business. Mentors must have the appropriate 'people' and management skills to perform the mentoring activity successfully.

Who Uses a Mentor?

The mentor program is primarily applicable to the distance student enrolled in the first semester introductory surveying course. Class sizes are typically 30-40 students, split about evenly between 'local' and distance students. Typically, 3-5 students per class (10-15%) use a mentor.

Most of the 'local' students and about half of the distance students attend the on-campus lab. The definition of what a 'local' student is has become somewhat blurred by the evolution of non-traditional classroom settings in the 'near' vicinity of the University. This is a consequence of the development of the various satellite 'classroom' sites within 50 miles of the ODU campus. In addition, the recent the advent of a new category of internet student has been created – the 'Non-Campus, In Region' student. Nevertheless, most of these students attend the on-campus lab.

A few students do not attend the lab at all, preferring to submit a portfolio of work which substantiates their experience with the objectives of the field lab. A certification by the individual's supervising licensed surveyor is required to validate the portfolio's content.

Finding a Mentor

Under current practice, the student is responsible to obtain the assistance of a suitable mentor. While assistance from the local Association of Surveyors is desirable, in practice, most of the students utilize their own contacts or obtained referrals from their distance site administrators to make a suitable contact.

A majority of the distance students enrolled in the surveying classes are working adults employed in a surveying related occupation. These situations range from small, independent surveying businesses, to large full-service engineering and site development firms, as well as a wide variety of municipal, state and federal public works, highway department, and infrastructure management agencies. Thus, these students typically have ready access to a suitable mentor. Occasionally, a student is must seek out the assistance of local surveyor. We attempt to assist this process by providing points of contact if known, referring students to the local state association, providing a mentor checklist and consulting with surveyors who have been approached to be a mentor.

The lab for this class has evolved into an equipment exposure and basic data gathering mini-camp approach. The 'lab report' currently consists of copies of field notes and presentation of the reduction/results of the survey operations undertaken. The mentored students obtain the equivalent of this experience in a variety of ways, such as participating in actual field crew operations, 'lab' sessions at the 'office' by the mentoring land surveyor or staff, borrowing of equipment and assistance to collect data, or some combination of these approaches. All students submit the equivalent of a lab report, the form of which is only constrained by the requirement to present an organized collection of field notes, data reduction and a summary of results.

Achievement of Course Objectives

Assessing the achievement of course objectives requires an assessment of the students experience level. The students in this course range from neophytes with zero experience with surveying or engineering to individuals with years of field crew or back-office knowledge. For the neophyte, the mentoring process can yield a better result than the group field lab. Students get individual attention and frequently able to participate in on-the-job activities. Students often comment on 'how much they learned' by spending a day on the job with a field crew. We might think of this experience as a 'mini' apprenticeship.

In general, students who elect the Mentor option score higher on the lab. This can be attributed to several factors. First, the students who elect the mentor option are frequently older and either currently employed in surveying or site development businesses, or have contacts in those fields. Also, the students expressing a desire to use the mentor option are actively vetted by the instructor and their progress tracked more diligently than the other students. There is no methodology currently in place to evaluate the quality of the lab exposures other than the lab report.

	Fall 2007	Fall 2003	Fall 2002	Summer 2001
Total Student Enrollment	27	21	19	26
Average Grade	82.5	92	66.7	81
Students Using the Mentor Option	4	4	4	2
Average grade	90.5	95	72.6	82.5

Two case studies serve to illustrate the process and efficacy of the mentoring program. The Fall 2007 Principles of Surveying class included two students at exceptionally remote sites from ODU. One student attended class at Yavapai Community College in Prescott, Arizona. The other at Olympic Community College is located in Bremerton, Washington.

Students are polled early in the semester to determine who will be using a mentor. Guidance on mentor qualifications, how to locate and contact a potential mentor, and criteria pertaining to the field skill 'exposures' required are provided to the students. The student is then responsible to initiate contact with a potential mentor and secure the commitment of the individual. A skills checklist is provided to guide the mentor. The mentor will frequently also make contact with the course instructor by email or phone to discuss specific requirements.

At Yavapai Community College an enduring relationship with a local surveyor has been established. This surveyor voluntarily mentors 1 to 2 students per year. This semester's student was referred to the mentor by the distance site staff. He then contacted the surveyor and obtained his agreement to act as his mentor. Dates and times to accomplish the lab activities were agreed on. In this case, the student accompanied a field crew for one day, and then met with the mentor for a half a day at the mentor's office to review what was done in the field and address items on the checklist which were not covered by the day in the field. The student then wrote a lab report and submitted it to the instructor.

At Olympic Community College, the student was an active duty sailor. Currently we have no regular mentor in that area. The student independently contacted a local firm and was referred to another firm which agreed to assist him. The arrangement made here was also to accompany a field crew for a day, and then meet with the mentor to review and discuss what was done.

Both of these distance student's lab reports were scored above the mean for the class. For the course, the grade for one of these students was just below the mean while the graded for the other was well above the mean. In general the mentored students tend to receive grades above the mean.

Conclusion

The use of mentors allows distance students to fulfill the objectives of the program. Although the program has had success with the use of archived video to meet the objectives of other courses, our concern was that these students must operate equipment in the field in order to understand the environment in which they will work. The unappealing alternate was to perform this work inside, in a protected environment that was not adequately realistic for surveying professionals.

Bibliography

1. Betit, J, Betit, A.S., Hecht, J.F., 1997. *Guidance Document: Professional Land Surveyor Assisted Mentor Program for Support of Surveying Distance Education* (Draft). Norfolk, VA. Old Dominion University.