May 2006

# Distance Education and Undergraduate Nursing Students: How Effective Is It?

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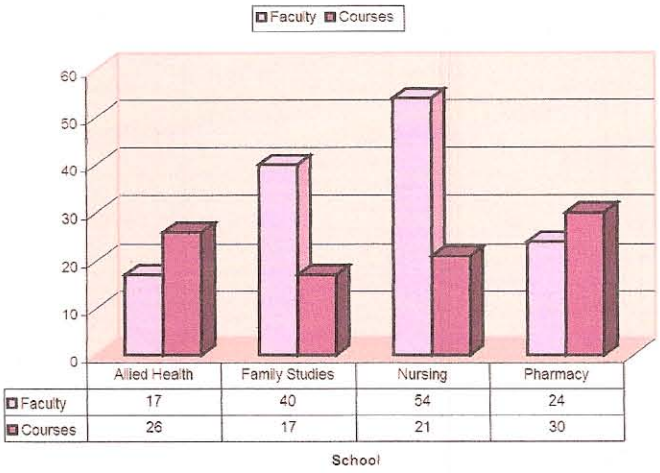
# Distance Education and Undergraduate Nursing Students: How Effective Is It?

The University of Connecticut regularly offers about 50 courses taught partially or entirely at a distance, with the School of Business offering their entire Master's program in accounting in this format. Clearly, technology is here to stay, and distance education is a major user of technology. As Delgado (2004) said, the genie's out of the bottle. As nurse-educators we must forge ahead and keep up with the times so as not to be left behind. "Widespread skepticism remains about the products and quality of technology," however (Foster, 2001, p. 116).

At the School of Nursing at the University of Connecticut, the majority of our undergraduate and graduate courses use Web-enhanced instruction to some degree, based on faculty preference and interest. The Figure shows the number of Web-based courses taught by school and by number of faculty: The School of Nursing offers the largest number of such courses with the smallest faculty.

Figure.

*Ratio of Faculty to Web-Enhanced Courses Offered by School in Division of Health & Human Development.*



One lower-division nursing course, Introduction to Health, provided a useful naturalistic setting for exploring differences between two Web-enhanced sections: A traditional in-class section (the "Traditional" section) and a section using interactive-audiovisual technology (the "Distance" section). This course is approved for General Education credit so students from all majors are eligible to enroll in it.

*Evaluative Case Study.*

This description involves the 155 students enrolled in the Introduction to Health course during the Fall of 2003, taught in two sections. The Distance section consisted of five subsections, each located at a different campus within the University of Connecticut system: Stamford, Storrs (the main campus), Torrington, Waterbury, and West Hartford, with a total of 66 students. Results from all Distance subsections are combined to protect the anonymity of individual respondents as some of these subsections were quite small (range, 6-21 students). The Distance subsections all met synchronously via interactive audio-video and asynchronously via WebCT, an internet-based course management platform. The Traditional section was a traditional classroom setting with 89 students enrolled, and also included a significant WebCT component.

Both Distance and Traditional sections used the same syllabus and had identical requirements. The course requirements included a number of elements, including objective, in-class midterm and final exams; a selection of papers and projects; and opportunities for earning extra credit. Most invited guest speakers presented to both sections. In addition, the faculty member teaching the course

spent time at each of the Distance subsection campuses in proportion to the number of students enrolled at that site. So, for example, he visited a campus with only six students only three times during the semester, while visiting campuses with over 20 students seven or eight times.

The purpose of this case study is to compare and contrast learning outcome data as a way to evaluate the effectiveness of distance education in undergraduate nursing education.

*Findings*

The sample consisted of 70% ($n$ = 108) freshmen and sophomores, 74% ($n$ = 115) nursing majors, and 90% ($n$ = 140) females. No significant differences exited between sections on these demographic variables on chi-square analysis.

Means and standard deviations for all course components and total points for the Traditional and Distance sections are shown in Table 1. The only significant difference was in extra credit points, with students in the Traditional section accumulating a higher number.

Table 1

*Means, Standard Deviations, and t-tests for All Outcome Measures by Section (Traditional, n = 89; Distance, n = 66).*

| Variable | Section | *M* | *SD* | *t* | *dF* | *p* |
|---|---|---|---|---|---|---|
| Total Class Points | Traditional | 92.1 | 8.8 | 1.3 | 135.9 | .20 |
| | Distance | 90.2 | 9.3 | | | |
| Non-Exam Points | Traditional | 58.0 | 7.5 | 1.2 | 138.6 | .24 |
| | Distance | 56.5 | 7.7 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Midterm Exam | Traditional | 19.2 | 2.1 | 0.6 | 127.1 | .53 |
| | Distance | 19.0 | 2.5 | | | |
| Final Exam | Traditional | 14.9 | 2.2 | 0.6 | 128.5 | .55 |
| | Distance | 14.7 | 2.5 | | | |
| Extra Credit | Traditional | 2.8 | 1.2 | 5.9 | 153.0 | .00 |
| | Distance | 1.8 | 0.8 | | | |

Means and standard deviations for these same course components and total points by division (lower vs. upper) are shown in Table 2. The differences in total class points, midterm exam, and final exam were all significant, with upper division students having higher scores. The one area in which lower division students had higher scores was in extra credit points.

Table 2

*Means, Standard Deviations, and t-tests for All Outcome Measures by Division (Lower, n = 108; Upper, n = 44).*

| Variable | Division | *M* | *SD* | *T* | *Df* | *P* |
|---|---|---|---|---|---|---|
| Total Class Points | Lower | 90.2 | 9.1 | -2.3 | 94.2 | .02 |
| | Upper | 93.7 | 8.4 | | | |
| Non-Exam Points | Lower | 56.7 | 7.3 | -1.3 | 85.9 | .19 |
| | Upper | 58.4 | 7.5 | | | |
| Midterm Exam | Lower | 18.9 | 2.1 | -2.4 | 90.3 | .02 |
| | Upper | 19.8 | 2.1 | | | |
| Final Exam | Lower | 14.5 | 2.2 | -2.9 | 91.9 | .01 |

| Variable | Division | *M* | *SD* | *T* | *Df* | *P* |
|---|---|---|---|---|---|---|
| | Upper | 15.6 | 2.1 | | | |
| Extra Credit | Lower | 2.4 | 1.2 | 1.8 | 93.8 | .08 |
| | Upper | 2.0 | 1.1 | | | |

Means and standard deviations by major (nursing vs. other) are shown in Table 3. The only differences that were significant were extra credit and final exam points, with nursing majors earning a higher numbers of points on both.

Table 3

*Means, Standard Deviations, and t-tests for All Outcome Measures by Major (Nursing, n = 115; other, n = 40).*

| | Major | *M* | *SD* | *t* | *dF* | *P* |
|---|---|---|---|---|---|---|
| Total Class Points | Other | 89.0 | 9.4 | -1.8 | 64.3 | .08 |
| | Nursing | 92.1 | 8.8 | | | |
| Non-Exam Points | Other | 56.6 | 7.6 | -1.6 | 65.1 | .12 |
| | Nursing | 57.8 | 7.2 | | | |
| Midterm Exam | Other | 19.0 | 2.1 | 0.8 | 70.5 | .45 |
| | Nursing | 19.2 | 2.2 | | | |
| Final Exam | Other | 14.2 | 2.4 | -2.0 | 59.7 | .05 |
| | Nursing | 15.1 | 2.1 | | | |
| Extra Credit | Other | 2.0 | 1.0 | -2.2 | 77.6 | .03 |
| | Nursing | 2.5 | 1.2 | | | |

Finally, t-tests were run for all outcome variables by gender, with Table 4 containing the results, including means and standard deviations. Males scored significantly higher on the final exam than females.

Table 3

*Means, Standard Deviations, and t-tests for All Outcome Measures by Gender (Male, n = 15; female, n = 140).*

| | Gender | *M* | *SD* | *t* | *DF* | *P* |
|---|---|---|---|---|---|---|
| Total Class Points | Male | 91.3 | 8.9 | .03 | 17.2 | .98 |
| | Female | 91.3 | 9.1 | | | |
| Non-Exam Points | Male | 55.5 | 7.3 | -1.0 | 17.3 | .35 |
| | Female | 57.4 | 7.4 | | | |
| Midterm Exam | Male | 20.0 | 2.6 | 1.3 | 16.1 | .20 |
| | Female | 19.1 | 2.1 | | | |
| Final Exam | Male | 15.8 | 1.9 | 2.2 | 18.4 | .05 |
| | Female | 14.8 | 2.2 | | | |
| Extra Credit | Male | 2.1 | 1.1 | -0.8 | 17.8 | .42 |
| | Female | 2.4 | 1.2 | | | |

Two-way analysis of variance (ANOVA) computations were also conducted using section and division, major, and gender for all course components and total points. The only significant difference was noted for extra credits points, with lower division nursing students in the Traditional section accumulating the highest number. All other ANOVA results were nonsignificant.

*Discussion.*

The findings of this naturalistic observation validate previous conclusions that distance education is as effective as the traditional classroom mode when evaluating student learning outcomes (Anders, 2001; Draves, 2002). The only class component on which students in the Traditional section outscored students in the Distance section was on extra credit points. The reason for this is unclear but could have been the result of students in the Traditional section having more face-to-face contact with the faculty member. Upper division students scored significantly higher on total class points (which translated into an A for upper division students and A- for lower division students), as well as on the midterm and final exams, probably reflecting their more highly developed study and test-taking skills. Nursing majors accumulated more extra credit points than other majors and, again, the reason for this is unclear, but could have had to do with this group of students being more highly motivated as the course was in their major field of study. Finally, gender produced no statistically significant differences in any of the class components, demonstrating that learning outcomes were not affected by gender, at least in this course. The follow-up ANOVAs examining the influence of section when combined with the other demographics showed significance only in the number of extra credits points accumulated, with lower division nursing majors in the Traditional section accumulating a higher number of points.

The embracing of technology in education is in accord with many current trends. Already, some 35% of workforce training is now computer-mediated

(Draves, 2002). Historically business needs have influenced higher education and higher education has focused on preparing professionals for the work force. If professionals are learning online in their work, agencies will be most interested in recruiting students who have the skills and abilities to learn online. With growth of distance education to continue, it is encouraging to validate the belief that learning via this medium is as effective as learning in the traditional classroom.

# References

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