Online, On-Ground: What's the Difference

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Educators question if student performance levels in the online environment are comparatively equal to the traditional classroom environment. Some practioners suggest that online instruction is inferior because it lacks the interpersonal environment created when students and teachers communicate face-to-face. To appropriately evaluate and compare the effectiveness of various instructional delivery methods, data measuring student performance must be collected, compiled, and evaluated. This information can then be used to effect improvement and growth of instruction, as well as ensure similar student performance outcomes regardless of delivery method.

A Sloan Consortium study stated that the number of online students in post secondary education will rise to over 2.6 million in fall of 2004 with an expect 20% growth rate in the future (2005). Reflecting this trend, there are websites devoted to providing information to potential students regarding online degree programs at the associate, bachelor, and graduate level (ClassesUSA, 2005; dx: the distanceXchange, 2005). The University of Phoenix offers online degrees (2005) and Massachusetts Institute of Technology's OpenCourseWare program makes course materials available online to the general public (2003).

Limited resources have been employed to examine the impact of online education on the student. Primarily, studies have fallen into the two general categories of pretest-posttest models and opinion surveys. Most of the studies have contained relatively small sample sizes, have been performed over short time periods, and measured a single teacher's experience with the two delivery methods of traditional and online (Ury, 2004).

Recently more quantitative and longer-range studies have begun to appear, with mixed results. A study of two master's programs at the University of Paisley in Scotland showed significant differences in online and face-to-face learning, with online students outscoring face-to-face students (Stansfield, McLellan, & Connolly, 2004). University of Wisconsin - La Crosse researchers evaluated performance of students in an educational and media technology course required for preservice teacher education students, and found no significant difference in performance (Ali & Elfessi, 2004). At Michigan State University, researchers compared student performance in classroom and online courses in Principles of Microeconomics and found that online students fared significantly worse on the most complex material (Brown & Liedholm, 2002). A five-semester study of students in a required undergraduate business statistics course at Indiana State University showed no significant difference in performance among students who completed the course (McLaren, 2004).

Methodology and Findings

Over the past six years, the authors have developed numerous online applications at Northwest Missouri State University in Maryville, MO. These projects have included the development of online learning modules, assessment instruments, and complete course delivery models. The authors have conducted both long-term and short-term research comparing student performance in online and on-ground learning

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environments. They measured student success in both delivery modes, using a variety of instruments and sample sizes. In some cases individual project grades were evaluated and in others complete course grades were compared. A confidence level of 95% was used to determine significant differences.

The Management Information Systems (MIS) course is a high volume (multi-section) course taught and developed by multiple instructors in the Computer Science/Information Systems department. Data was accumulated over the past six years comparing course performance of online students to that of traditional classroom students. Final course grades for 581 traditional classroom students were compared to137 online students. There were no significant differences in these groups when comparing gender, overall GPA, or ACT scores. The online delivery method was found to be effective with an average course grade near 80%. However, the online student mean grade (80%) was significantly lower than the mean grade of students enrolled in traditional sections of the same course (85%).

During the 2004-2005 academic year, grades for 162 traditional classroom MIS students were compared to 65 online MIS students for a series of technical assignments that required database and spreadsheet skills. These assignments consisted of a database lab exam, a database project, a spreadsheet lab exam, and a spreadsheet project. These particular assignments were supported by online, asynchronous multimedia presentations. There were no significant differences in average mean scores between online and classroom students on three of these assignments: The database exam, the database project, and the spreadsheet exam. There was a significant difference between online student scores on the spreadsheet project (82%) and traditional student mean scores (90%).

Librarians tracked online and on-ground student performance on a library assignment embedded in a computer literacy course for one academic year. Grades for 536 traditional classroom students were compared to 42 online students. The computer literacy course at Northwest is a high volume (multi-section) course taught by multiple instructors in partnership with a variety of librarians. The average score of students from the two venues were compared and analyzed. There were no significant differences in student scores. It was further determined that the average course grade for online students of 77.91% was virtually equal to that of traditional classroom students whose mean score was 77.99%.

Implications

The findings of this study illustrate that traditional classroom courses can evolve into online offerings with a measured degree of success. Student performance on the library assignment contained in a computer literacy course exhibited equally successful results in both online and on-ground delivery modes. Student performance as measured by final grade percentage in the MIS course delivered in the same two venues illustrated successful but significantly different mean scores (80% for online students and 85% for on-ground students).

The authors analyzed the delivery methods for the library use assignment, finding that the librarians had effectively transferred traditional class learning methods to the online environment by using software that allowed them to record and deliver the lectures provided in the on-ground classroom in an online asynchronous environment. In addition, online students were required to communicate with the librarians in order to complete the assignment.

Recorded lectures were not included for the MIS course content, but component or module lectures were included as a part of the database and spreadsheet assignments within the course. In examining the data from these four assignments, no significant differences were found in mean score on three of the assignments. The assignment that illustrated a significantly higher average score for classroom students over online students was a complicated decision support system spreadsheet application. For both venues of instruction, interaction between individual students was required in the form of discussion topics

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posted by the instructor; however, no regular communication with the instructor was required in any portion of the MIS course.

The implications of these findings are that online courses of study should not simply be translated from verbal to nonverbal modes of communication, but instead should mimic the modes of instruction used in on-ground classes. Online students who saw and heard information, as well as communicated with instructors as they completed their assignments, performed at the same level as students in on-ground classes. This may not hold true on difficult and intricate technical projects for students who need one-on-one assistance to work through technical problems.

References

Ali, A., & Elfessi, A. (2004). Examining students performance and attitudes toward the use of information technology in a virtual and conventional setting. *Journal of Interactive Online Learning, 2*(3), Retrieved from: http://www.ncolr.org/jiol/archives/2004/winter/05/.

Brown, B., & Liedholm, C. (2002). Can Web courses replace the classroom in principles of microeconomics? *The American Economic Review, 92*(2), 444-448.

ClassesUSA. (2005). Online degree programs. Retrieved May 15, 2005, from http://www.classesusa.comdx

The distanceXchange. (2005). Welcome to the distanceXchange... Retrieved May 15, 2005, from http://www.distancex.com/

Massachusetts Institute of Technology. (2003). MIT open courseware. Retrieved May 12, 2005, from http://ocw.mit.edu/index.html

McLaren, C. (2004). A comparison of student persistence and performance in online and classroom business statistics experiences. *Decision Sciences 2*(1), 1-10.

Sloan Consortium. (2005). Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004. Retrieved May 10, 2005, from http://www.sloan-c.org/resources/survey.asp

Stansfield, M., McLellan, E., & Connolly, T. (2004). Enhancing student performance in online learning and traditional face-to-face class delivery. *Journal of Information Technology Education, 3,* 173-188.

University of Phoenix. (2005). Univerisy of Phoenix Online. Retrieved May 12, 2005,from http://onl.uophx.edu/default.aspx?p=degrees

Ury, G. (2004, November). A longitudinal study comparing undergraduate student performance in traditional courses to the performance in online course delivery. *The Proceedings of ISECON 2004, the 21st Annual Conference on Information Systems Education*, Newport, RI, November 3-7, 2004.

Biographical Sketches

Dr. Gary Ury is an Assistant Professor and coordinator of MIS curriculum at Northwest Missouri State University in the Computer Science/Information Systems department. He has presented and published numerous papers on student assessment and online course delivery at a variety of international, national, and regional conferences such as ISECON, AIM, NCA, Stop Searching and Start Teaching, Computers on Campus, Consortium for Computing Sciences in Colleges.

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