Health Science Students and Their Learning Environment: A Comparison of Perceptions of On-Site, Remote-Site, and Traditional Classroom Students

by P. Elison-Bowers, PhD, RHIA; Chareen Snelson, EdD; Mario Casa de Calvo, PhD; and Heather Thompson, MS

Abstract

This study compared the responses of on-site, remote-site, and traditional classroom students on measures of student/teacher interaction, course structure, physical learning environment, and overall course enjoyment/satisfaction. The sample population consisted of students taking undergraduate courses in medical terminology at two western colleges. The survey instrument was derived from Thomerson's questionnaire, which included closed- and open-ended questions assessing perceptions of students toward their courses.

Controlling for grade expectations, results revealed no significant differences among the on-site, remote-site, and traditional classroom students in any of the four cluster domains. However, a nonsignificant (and continuing) trend suggested that students preferred the traditional classroom environment.

When results were controlled for age, significant differences emerged between traditional and nontraditional students on measures of student/teacher interaction, physical learning environment, and overall enjoyment/satisfaction, as nontraditional students exhibited higher scores. Students' responses to open-ended questions indicated they enjoyed the convenience of online instruction, but reported finding frustration with technology itself.

Key Words: adult learner, distance education, interactive video

Introduction

Ongoing advances in technology have enabled educators to turn the concept of a classroom without walls (or "virtual classroom") into reality. Concurrent with the way in which technology is reshaping education is the issue regarding the evaluation of distance learning. The accreditation of Jones International University, the first online institution to receive full accreditation, generated intensive debate on this topic.¹

Some sources believe that in the future, most college instructors will be involved in some form of distance learning.^{2,3} In addition to the diminishing costs and increasing availability of new technologies, another facilitator of distance learning is the ever-changing profile of university students.⁴ Nontraditional students are soon expected to make up at least 30 to 50 percent of all college students.^{5,6} The primary

consumers of distance education are adult learners who welcome the flexibility of off-site learning. Many of these students have professional and/or familial responsibilities that prevent them from enrolling in traditional, campus-centered courses.^{7–9} Indeed, many observers note that adult consumers of distance education are typically highly motivated, and respond particularly well to modes of delivery centered on the assumption that learners will independently pursue their goals with integrity and will be responsible for their own learning.^{10,11}

Another force indirectly shaping the future of distance learning is the restructuring of healthcare delivery systems. The U.S. healthcare industry employs approximately 13.5 million individuals, and the healthcare work force constitutes one of the fastest growing segments of the labor market.^{12,13} As Isaacs, Sandy, and Schroeder state succinctly, "The strength of our nation's health care system depends heavily on the quality and quantity of its health care work force."¹⁴ There is increasing emphasis on continuing education in medicine and nursing, and distance learning is viewed as an ideal way for practicing health professionals to engage in lifelong learning.^{15–17} Many institutions are involved in the development of networks that support distance learning for health professionals, patient education, telemedicine, and medical informatics.^{18–22}

Distance learning and telemedicine are considered vehicles for educating health professionals in medical informatics and for promoting the interdisciplinary communication and collaboration that is essential to healthcare delivery.²³ The focus of the current study concerned the exploration of student satisfaction with instruction presented via two-way interactive video (IATV). Student attitudes have been consistently identified as a vital component of the learning process.²⁴ Without the proper identification of pedagogical practices that promote positive student attitudes, students may become discouraged with the learning process and may become at risk for the cessation of their formal education.²⁵ Distance learning offers a unique opportunity for many students (particularly nontraditional students and those who live in rural areas) to continue their education or to take courses that would not otherwise be offered at their location.^{26,27} At the same time, it is possible that the distance-learning format itself may present certain challenges with respect to student/teacher interaction, course structure, physical learning environment, and technology. Ongoing evaluation of distance learning programs is essential for the continuous improvement of this burgeoning area of education.

The purpose of the current study was to compare the responses of on-site, remote-site, and traditional college classroom students enrolled in a course in medical terminology at two separate western colleges. One college was a four-year institution, and the other was a two-year college. All participants were enrolled in a medical terminology undergraduate class at the 100 or 200 level. In the four-year college, students were enrolled for three credits, and at the two- year college, students were enrolled for two credits. Since age has emerged as a significant factor in the literature on distance learning, with mature learners cited as having an advantage over their younger peers, an analysis of covariance (ANCOVA) was conducted on age and grade distribution in the classes surveyed.²⁸

Delimitations of the study were (1) the study addressed only one of the required courses taken by health science students, (2) students of different health science majors were combined when comparing student perceptions, and (3) students enrolled in two- and four-year health science programs were combined when comparing student perceptions.

Limitations of the study were (1) examination scores of some students may have been influenced by prior academic experience, (2) student responses to the questionnaire may have reflected the presentational skills of the instructor, and (3) student responses to the questionnaire may have reflected preferences in subject matter.

A basic assumption of this study was that students in each of the two groups received the same course material. It was assumed that the students felt sufficiently comfortable and secure in recording their true perceptions of their experience.

Hypotheses

The current research issue of whether there are significant differences in the perception of student/teacher interaction, course structure, physical learning environment, and overall course enjoyment among on-site, remote-site, and traditional classroom students was used to examine the combined effect of the four clusters. Five hypotheses were derived from this question for the purpose of examining the basic assumptions underlying this study:

H1: Controlling for expected grade, there will be no significant differences in perceptions of student/teacher interaction among on-site, remote-site, and traditional classroom students.

H2: Controlling for expected grade, there will be no significant differences in perceptions of course structure among on-site, remote-site, and traditional classroom students.

H3: Controlling for expected grade, there will be no significance differences in perceptions of physical learning environment among on-site, remote-site, and traditional classroom students.

H4: Controlling for expected grade, there will be no significant differences in perceptions of overall satisfaction/enjoyment among on-site, remote-site, and traditional classroom students.

H5: Controlling for age, there will be no significant differences in perceptions of student/teacher interaction, course structure, physical learning environment, and overall course enjoyment/satisfaction among on-site, remote-site, and traditional classroom students.

Methods

The current sample consisted of health science students taking undergraduate courses in medical terminology at two western colleges. Consistent with previous research on distance learning, nontraditional students composed the majority of students at the remote site. Conversely, traditional students composed the majority of students on-site and in the traditional classroom setting. Specifically, at the four-year institution, 115 students enrolled in the traditional classroom, 33 students enrolled in the remote-site classroom, and 68 enrolled in the on-site classroom. Similarly, at the two-year institution, 63 students enrolled in the traditional classroom, 20 students enrolled in the remote-site classroom, and 34 enrolled in the on-site classroom. Because age has been identified as a significant factor in distance learning (favoring nontraditional students age 25 and older), the analysis of data controlled for age so as not to confound results. Likewise, the study controlled for students' grade expectations.

The data for the study were gathered using a pilot-tested, modified version of Thomerson's (1995) questionnaire, which has shown to be a very reliable instrument (Cronbach's $\alpha = .94$; see Figure 1).²⁹ The survey instrument included both closed-ended and open-ended questions designed to assess perceptions of students toward their courses. For the purpose of subsequent statistical analysis, 21 items are grouped into four cluster areas. Five statements measure student/teacher interaction, focusing on dialogue and communication between students and instructor, and among students themselves. Six statements measure course structure, relating to the rules, policies, teaching methods, and procedures used to conduct the class. Five statements assess the physical learning environment, including equipment, furnishings, and actual classroom surroundings. The final five statements measure students' overall enjoyment and satisfaction with the course. The questions are graded on a five-point Likert-type scale ranging from strongly disagree to strongly agree.

The open-ended questions asked respondents to identify what they liked most and least about taking a course in an on-site, remote-site, or traditional classroom, and to suggest ways in which they believe the class could be improved. The responses to these questions are especially valuable for an educational format that is continually evolving as a result of new technologies and has a primary audience of nontraditional learners.

The questionnaire was administered to all undergraduate students enrolled in medical terminology courses at both institutions in fall semester. In sum, the questionnaire was administered to 333 students, with 200 students completing the questionnaire across both colleges (response rate of 60.1 percent). Mean scores and standard deviations were calculated for each question on the survey instrument. Additionally,

an overall cluster mean and standard deviation were calculated for each of the four cluster components of the instrument. The cluster mean scores were derived by adding all of the individual question responses contained in the cluster group and dividing by the number of questions in the cluster group. An analysis of covariance (ANCOVA) was used to determine if significant differences existed between the three groups for each of the cluster areas, using age and expected grades as covariates. An alpha level of .05 was used as the determinant of significance.

Results

For the cluster item of student/teacher interaction, the overall mean scores of the on-site, remote-site, and traditional classroom groups were, respectively, 3.9500, 3.7274, and 4.2830. The total mean score of all groups for this cluster was 3.9769 (Table 1). Analysis of the mean scores of individual questions found the traditional classroom group to have the highest quality of student/interaction means on all five questions in the cluster.

For course structure (Table 2), the overall cluster mean scores of the on-site, remote-site, and traditional classroom groups were, respectively, 3.8942, 3.8056, and 4.1833. The total mean score of all groups for this cluster was 3.910. The traditional classroom group was found to have the highest course structure means on all five questions contained in this cluster.

For physical learning environment (Table 3), the overall cluster mean scores of the on-site, remotesite, and traditional classroom students were, respectively, 3.2346, 3.1976, and 3.1920. The total mean scores of all groups for this cluster was 3.2080. The traditional group displayed the highest means on two questions (Q2, Q10), pertaining to conduciveness and visual proximity, whereas the on-site group displayed the highest means on two questions (Q3, Q14) relating to physical surroundings/attentiveness and distractedness. Finally, the remote-site group displayed the highest mean on one question (Q19) pertaining toward ease in hearing the instructor.

For overall course enjoyment/satisfaction (Table 4), the on-site, remote-site, and traditional classroom group means were, respectively, 3.7808, 3.7036, and 4.0123. The total mean score of all groups for this cluster was 3.8322. The traditional group was found to have the highest mean on four questions (Q7, Q9, Q13, Q20), pertaining to instructor responsiveness, class enjoyment, sense of accomplishment, and course recommendation, while the remote-site groups displayed the highest mean on one question (Q6) related to getting to know other classmates.

Quantitative analysis of data using an analysis of covariance (ANCOVA) to control for grade expectations revealed no significant differences among the on-site, remote-site, and traditional classroom students in any of the four cluster domains in terms of the students' expected grade. Table 5 presents an ANCOVA overall cluster by group with *F*- and *p*-values for expected grade. These results indicate that the students' perceptions of the medical terminology course did not differ in any meaningful way, regardless of the grade that they expected to attain.

An analysis of covariance was used to compare the cluster means between the three groups on student/teacher interaction, course structure, physical learning environment, and overall enjoyment/satisfaction as a function of student age. The analysis of covariance (controlling for age) yielded estimated *p*-values of .016 for student/teacher interaction, .280 for course structure, .016 for physical learning environment, and .003 for overall course enjoyment. (See Table 6.) So students' perceptions of the quality of student/teacher interaction, physical learning environment, and overall course enjoyment of the medical terminology course significantly differed by student age. Specifically, significant differences were revealed between traditional and nontraditional students on measures of student/teacher interaction, physical learning environment/satisfaction, as nontraditional students in all three groups exhibited higher scores. However, when pairwise *t*-tests were calculated to determine if there were significant differences between on-site, remote-site, and traditional classroom students on measures of student/teacher interaction, course structure, physical learning environment, and overall course enjoyment and satisfaction, no significant differences between groups were detected (see Table 7).

The students' responses to the open-ended questions reflected the conditions under which learning took place. Consistent with previous research on distance learning, remote-site students enjoyed the convenience of not having to travel, the ability to schedule their viewing, and the opportunity to take classes that would otherwise not be available. At the same time, both on-site and remote-site students were frustrated by problems with the technology itself.

Discussion

The findings from this study parallel those commonly reported in the literature on distance learning; statistical analyses revealed no significant differences between on-site, remote-site, and traditional classroom students on measures of student/teacher interaction, course structure, physical learning environment, and overall course enjoyment/satisfaction.^{30,31} While not statistically significant, a continuing trend suggested that overall, students preferred the traditional classroom environment. Only age was found to have a significant influence on students' perceptions of learning. The literature on distance learning consistently reports that consumers of distance learning are mature learners who are highly motivated to obtain a degree in order to advance their career, move to a new occupational field, or return to the work force.^{32–34} Many live in rural communities where courses would be limited without opportunities for distance learning. In addition, work and/or family responsibilities may preclude their ability to attend regularly scheduled classes; thus, not having to travel and being able to take a course on their own time is seen as a major advantage.

Indeed, the above advantages were frequently cited by remote students in response to the question of what they enjoyed most about remote-site courses. Classroom students enjoyed the traditional setting, which they found conducive to communication with the instructor and other students. On-site students cited the dual advantage of being able to speak personally with the instructor or being able to participate electronically if the class was missed.

However, responses to open-ended questions revealed a discrepancy between quantitative results, which failed to find significant differences between the three student groups, and qualitative responses, which reflected the conditions in which learning took place. Only two complaints were reported by students in the traditional classroom. In contrast, both on-site and remote-site students frequently reported problems with equipment. Several students also felt that the environment was less conducive to class interaction and that it lacked the sense of belongingness enjoyed by students in a traditional class.

The themes that emerged in analysis of qualitative data illustrate the major advantages and disadvantages commonly attributed to distance learning. Convenience and opportunity are particular strong points for mature learners and those living in rural areas. Comparable findings on measures of student/teacher interaction, course structure, physical environment, and overall enjoyment/satisfaction confirm that distance learning poses a viable alternative to traditional classroom learning. Mature learners do especially well with this format; in fact, maturity and motivation have been identified as factors that promote success in distance learning.³⁵ Mature learners currently compose a majority of students enrolled in distance courses, a figure that is likely to grow as more nontraditional students enter all levels of higher education.

Conclusion

Despite the limitations of the current research, the results derived from this study importantly suggest that ongoing efforts to extend distance learning can offer many new learning opportunities, which may be especially beneficial for nontraditional students or for those students situated in inconvenient (i.e., rural) locations. However, further study investigating overall student preferences trending toward traditional classroom environments is recommended. Additionally, the growing proportion of nontraditional students as substantial consumers of higher education highlights the significance of discerning their educational needs, desires, and expectations.³⁶

P. Elison-Bowers, PhD, RHIA, is an associate professor in the department of psychology and community and environmental health at Boise State University in Boise, Idaho.

Chareen Snelson, EdD, is an assistant professor in the department of educational technology at Boise State University in Boise, Idaho.

Mario Casa de Calvo, PhD, is an assistant professor in the department of psychology at Boise State University in Boise, Idaho.

Heather Thompson, MS, is a lecturer in the department of psychology at Boise State University in Boise, Idaho.

Notes

- 1. Olsen, F. "Virtual Institutions Challenge Accreditors to Devise New Ways of Measuring Quality." *Chronicle of Higher Education* 45 (1999): A29–A30.
- 2. Ibid.
- Cwiklik, R. "Technology (A Special Report): Pieces of the Puzzle—Different Course: For Many People, College Will No Longer Be a Specific Place, or a Specific Time." *Wall Street Journal* (November 16, 1998), R31.
- Wan, Z., Y. Fang, and D. J. Neufeld. "Role of Information Technology in Technology- Mediated Learning: A Review of the Past for the Future." *Journal of Information Systems Education* 18 (2007): 183–192.
- 5. Bye, D., D. Pushkar, and M. Conway. "Motivation, Interest, and Positive Affect in Traditional and Nontraditional Undergraduate Students." *Adult Education* 57 (2007): 141–158.
- 6. Carney-Crompton, S., and J. Tan. "Support Systems, Psychological Functioning, and Academic Performance of Nontraditional Female Students." *Adult Education Quarterly* 52 (2002): 140–154.

7. Ibid.

- Bisciglia, M. G., and E. Monk-Turner. "Differences in Attitudes Between On-Site and Distance-Site Students in Group Teleconference Courses." *American Journal of Distance Education* 16 (2002): 37– 52.
- 9. McHenry, L., and M. Bozik. "From a Distance: Student Voices From the Interactive Video Classroom." *TechTrends*, November/December 1997, 20–24.
- Gomez, E. G., H. Ehrenberger, P. J. Murray, and C. R. King. "The Impact of the National Information Infrastructure on Distance Education and the Changing Role of the Nurse." *Oncology Nursing Forum* 25, no. 10 (1998): 16–20.
- 11. Williams, S. L. "The Effectiveness of Distance Education in Allied Health Science Programs: A Meta-Analysis of Outcomes." *American Journal of Distance Education* 20 (2006): 127–141.
- Isaacs, S. L., L. G. Sandy, and S. A. Schroeder. "Grants to Shape the Health Care Workforce: The Robert Wood Johnson Foundation Experience." *Health Affairs* 15 (1996): 279–295.
- 13. U. S. Department of Labor, Bureau of Labor Statistics. "Occupational Outlook Handbook, 2006–07: Health Care." December 22, 2005. Available at www.bls.gov/oco/cg/cgs035.htm.
- 14. Isaacs, S. L., L. G. Sandy, and S. A. Schroeder. "Grants to Shape the Health Care Workforce: The Robert Wood Johnson Foundation Experience." *Health Affairs* 15 (1996): 279.
- 15. Davis, D. "Continuing Medical Education: Global Health, Global Learning." *British Medical Journal* 316 (1998): 385–389.
- 16. Canavan, K. "Nurses' CE Options Expand with Distance Learning." *American Journal of Nursing* 97, no. 10 (1998): 59–60.
- 17. Gallagher, L. "Continuing Education in Nursing: A Concept Analysis." *Nurse Education Today* 27 (2007): 466–473.
- 18. Isaacs, S. L., L. G. Sandy, and S. A. Schroeder. "Grants to Shape the Health Care Workforce: The Robert Wood Johnson Foundation Experience."
- 19. Davis, D. "Continuing Medical Education: Global Health, Global Learning."

- Elfrink, V. "The Omaha System: Bridging Nursing Education and Information Technology." Online Journal of Nursing Informatics 3, no. 1 (July 13, 1999). Available at <u>http://www.eaa-knowledge.com/ojni/ni/dm/ojni.html</u>.
- 21. Gassert, C. A. "The Challenge of Meeting Patients' Needs with a National Nursing Informatics Agenda." *Journal of the American Medical Informatics Association* 5 (1998): 263–268.
- Schnepf, J. A., D. H. C. Du, E. R. Ritenour, and A. J. Fahrmann. "Building Future Medical Education Environments Over ATM Networks." Association for Computing Machinery, *Communications of the ACM* 38, no. 2 (1995): 54–69.
- Knaup, P., M. Ball, H. Reinhold, L. Chan, and W. Swinkels. "Necessity and Potential of Educating Medical Students, Physicians, and Other Health Care Professionals in Medical Informatics." *Medical Teacher* 21 (1999): 73–76.
- Landrum, E. R., J. M. McAdams, and J. Hood. "Motivational Differences Among Traditional and Nontraditional Students Enrolled in Metropolitan Universities." *Metropolitan Universities* 11 (2000): 87–92.
- 25. Rysberg, J. A. "Effects of Modifying Instruction in a College Classroom." *Psychological Reports* 58, no. 3 (1986): 965–966.
- Tallent-Runnels, M. K., J. A. Thomas, W. Y. Lan, S. Cooper, T. C. Ahern, S. M. Shaw, and X. Liu. "Teaching Courses Online: A Review of the Research." *Review of Educational Research* 76, no. 1 (2006): 93–135.
- 27. Skorga, P. "Interdisciplinary and Distance Education in the Delta: The Delta Health Education Partnership." *Journal of Interprofessional Care* 16, no. 2 (2002): 149–157.
- 28. McHenry, L., and M. Bozik. "From a Distance: Student Voices From the Interactive Video Classroom."
- 29. Thomerson, J. D. "Student Perceptions of the Affective Experiences Encountered in Distance Learning." Unpublished doctoral dissertation, University of Georgia, Athens (1995).
- Knight, P. "Promoting Retention and Successful Completion on Masters Courses in Education: A Study Comparing E-Tuition Using Asynchronous Conferencing Software with Face-to-Face Tuition." *Open Learning: The Journal of Open and Distance Learning* 22 (2007): 87–96.
- Allen, M., E. Mabry, M. Mattrey, J. Bourhais, S. Titsworth, and N. Burrell. "Evaluating the Effectiveness of Distance Learning: A Comparison Using Meta-Analysis." *Journal of Communication* 54 (2004): 402–420.
- 32. McHenry, L., and M. Bozik. "From a Distance: Student Voices From the Interactive Video Classroom."
- 33. Green, C. P. "Multiple Role Women: The Real World of the Mature RN Learner." *Journal of Nursing Education* 26 (1987): 266–271.
- 34. Smith, T. "Nurse Practitioner Students in Rural Virginia Get Education Over the Air." *Health Care Strategic Management* 14, no. 11 (1996): 18–19.
- 35. Biner, P. M., M. L. Bink, M. I. Huffman, and R. S. Dean. "Personality Characteristics Differentiating and Predicting the Achievements of Televised-Course Students and Traditional-Course Students." *American Journal of Distance Education* 9, no. 2 (1995): 9.
- 36. Nelson, G.W. "A Measurement of Attitudes of Bureau of Land Management Employees toward Distance Learning." Unpublished doctoral dissertation, University of Idaho, Moscow (1997).

Overall Cluster Item and Individual Question Means and Standard Deviations for Student/Teacher Interaction Cluster

	On-Site	Remote-Site	Traditional	Total
	M	M	M	M
	SD	SD	SD	SD
Overall cluster results	3.9500	3.7274	4.2830	4.0797
	.6961	.8223	.5554	.6919
Q1. I felt comfortable contacting the instructor outside of class.	3.9423	3.8571	4.1132	4.0150
	1.0556	.8991	.9393	.9641
Q5. I felt comfortable asking questions during class.	3.4423	3.3659	4.0094	3.7286
	1.0921	1.1991	.8673	1.0429
Q7. The instructor was responsive to students' needs.	4.1154	4.0952	4.2830	4.2000
	.7835	.8782	.8136	.8206
Q12. Assignments and tests were returned in a timely fashion.	4.1735	3.4286	4.6887	4.2900
	1.1153	1.5640	.5751	1.1145
Q16. The instructor encouraged student participation.	4.0769	3.8571	4.3208	4.1600
	.8128	1.0948	.7374	.8591

Overall Cluster Item and Individual Question Means and Standard Deviations for Course Structure Cluster

	On-Site	Remote-Site	Traditional	Total
	M	M	M	M
	SD	SD	SD	SD
Overall cluster results	3.8942	3.8056	4.1833	4.0288
	.6963	.7659	.6316	.6953
Q4. The instructor used class time effectively for meeting the objectives of the course.	4.0000	3.7857	4.4000	4.1658
	.8632	1.2403	.7918	.9522
Q8. Examples and illustrations were effectively used by the instructor.	4.0962	3.8571	4.3962	4.2050
	.7478	1.0258	.7519	.8405
Q11. The amount of material covered was adequate for the credit received.	3.8654	4.0244	4.0000	3.9698
	1.0852	.8511	1.1127	1.0537
Q15. Course content was presented in a well-organized manner.	4.0385	3.6429	4.3396	4.1150
	.8623	1.2262	.8152	.9625
Q18. A variety of class activities were used to help present course content.	3.2308	3.2195	3.6226	3.4372
	.9623	1.1729	1.0731	1.0800
Q21. The course grading policies seemed fair.	4.1346	4.2857	4.3396	4.2750
	.9081	.8635	.8152	.8503

Overall Cluster Item Individual Question Means and Standard Deviations for Physical Learning Environment Cluster

	On-Site	Remote-Site	Traditional	Total
	M	M	M	M
	SD	SD	SD	SD
Overall cluster results	3.2346	3.1976	3.1920	3.2042
	.3793	.3803	.3278	.3517
Q2. The overall classroom environment was conducive to learning.	3.9038	3.7381	4.2857	4.0704
	.9953	.9892	.8849	.9614
*Q3. The physical surrounding of the room made it difficult to be attentive during class.	2.3846 1.2071	2.2381 1.0075	1.8396 .6920	2.0650 .9462
Q10. The visual aids used were easy to see.	4.0192	3.6429	4.2571	4.0653
	.7538	1.1223	.7342	.8650
Q14. There were few distractions during class.	3.8269	3.7317	3.9434	3.693
	.7598	1.0494	.9032	.9006
*Q19. I had a difficult time hearing the instructor during class.	2.0385	2.6429	1.6509	1.9600
	1.0283	1.2262	.7933	1.0314

*questions stated in the negative

	On-Site	Remote-Site	Traditional	Total
	M	M	M	M
	SD	SD	SD	SD
Overall cluster results	3.7808	3.7036	4.0123	3.8872
	.6908	.8767	.6636	.7289
Q6. I enjoyed getting to know fellow class members.	3.7308	3.8750	3.8571	3.8274
	.7699	.9388	.9750	.9151
Q9. I enjoyed attending class.	3.6538	3.5238	4.0283	3.8250
	1.0268	1.2733	.9900	1.0818
Q13. I had a sense of accomplishment after completing the course.	4.0962	3.9524	4.1509	4.0950
	.8227	1.1466	.8815	.9275
Q17. The method of course presentation kept my interest high throughout the entire course.	3.5192	3.3571	3.9151	3.6950
	.9998	1.3761	.9673	1.0945
Q20. I would recommend that other students take similar courses.	3.9038	3.7857	4.1038	3.9850
	.8462	1.0250	.8500	.8937

Overall Cluster Item and Individual Question Means and Standard Deviations for the Overall Course Enjoyment/Satisfaction Cluster

ANCOVA Overall Cluster by Group (On-Site, Remote-Site, and Traditional Classroom Students) with ANCOVA F- and p-values for Expected Grade

	SS	df	MS	ANCOVA F	р
Student/ Teacher Interaction	2.504	1	2.781	.000	.994
Course Structure	.264	1	.264	.583	.446
Physical Learning Environment	.151	1	.151	1.243	.266
Overall Enjoyment/ Satisfaction	4.832	1	4.832	.097	.756

*Indicates a significant difference at .05 level

ANCOVA Overall Clusters by Group (On-Site, Remote-Site, and Traditional Classroom Students) with ANCOVA F- and p-values for Age

	SS	df	MS	ANCOVA F	р
Student/ Teacher Interaction	2.504	1	2.504	5.933	.016*
Course Structure	.530	1	.530	1.717	.280
Physical Learning Environment	.716	1	.716	5.890	.016*
Overall Enjoyment/ Satisfaction	4.658	1	4.658	9.324	.003*

*Indicates a significant difference at .05 level

Cluster	Age	Ν	Mean	Std. Dev.	Std.
					Error
					Mean
Student/	Trad.	128	4.0375	.6729	5.947
Teacher					
Interaction	Nontrad.	72	4.1549	.7234	8.525
Course	Trad	128	4 1375	6977	6 167
Structure	IIau.	120	ч.1575	.0711	0.107
Structure	Nontrad.	72	4.1653	.6743	7.946
Physical	Trad.	128	3.1609	.3358	2.968
Learning					
Environment	Nontrad.	72	3.2813	.3682	4.340
Overall	Trad	128	3 708/	7150	6 3 1 0
Course	IIau.	120	5.7904	.7150	0.519
Enjoyment/	Nontrad	72	4 0451	7318	8 625
Satisfaction	1,011 // 44 .	, 2	1.0 101		0.020

Overall Age Differences in Clusters, t-test

Figure 1

Student Survey

Instructions: Please answer these questions. Please give your honest and open answers—your opinions are confidential. No attempt will be made to identify you—only group scores will be reported. Carefully bubble in your answer (with pen or pencil) that best represents your opinion for each question, and then turn this page over. If a question is unclear, please leave it blank. Thank you for your help!

Questions	Strongly Disagree	Disagree	Neutral/ Uncertain	Agree	Strongly Agree
1. I felt comfortable contacting the instructor outside of class.	0	0	0	0	0
2. The overall classroom environment was conducive to learning.	0	0	0	0	0
3. The physical surrounding of the room made it difficult to be attentive during class	0	0	0	0	0
4. The instructor used class time effectively for meeting the objectives of the course.	0	0	Ο	0	0
5. I felt comfortable asking questions during class.	0	0	Ο	0	0
6. I enjoyed getting to know fellow class members.	Ο	0	0	0	0
7. The instructor was responsive to students' needs.	0	0	0	0	0
8. Examples and illustrations were effectively used by the instructor.	0	0	0	0	0
9. I enjoyed attending class.	0	0	Ο	Ο	0
10. The visual aids used were easy to see.	0	0	0	0	0
11. The amount of material covered was adequate for the credit received.	0	0	0	0	0
12. Assignments and tests were returned in a timely fashion.	0	0	Ο	0	0
13. I had a sense of accomplishment after completing the course.	0	0	0	Ο	0
14. There were few distractions during class.	0	Ο	О	Ο	0
15. Course content was presented in a well-organized manner.	0	Ο	0	Ο	0
16. The instructor encouraged student participation.	0	0	0	Ο	0
17. The method of course presentation kept my interest high throughout the entire course	0	0	0	0	0
18. A variety of class activities were used to help present course content.	0	0	0	0	0

Health Science Students and Their Learning Environment: 17 A Comparison of Perceptions of On-Site, Remote-Site, and Traditional Classroom Students 19. I had a difficult time hearing the instructor during class. 0 Ο Ο 0 0 0 20. I would recommend that other students take similar courses. Ο 0 0 0 21. The course grading policies seemed fair. 0 0 0 0 0 Gender Age Group Ο 0 Male Traditional (up to and including 24 yrs. old) 0 0 Female Non-Traditional (25 yrs. old and up) Current Class Standing I participated in class via: 0 Freshman 0 Remote site distance learning (College A) 0 Ο Remote site distance learning (College B) Sophomore 0 0 Traditional classroom (College A) Junior Ο 0 Senior Traditional classroom (College B) Ο 0 Graduate Student Host site (College A course taught in MSB) 0 Host site (College B course Section 39) My Telecourse Experience: First time in telecourse at a 0 Ο Never taken a telecourse from a remote site remote site Multiple telecourse 0 enrollment at remote site

Please write your answers to the following questions in the space provided. Remember, your responses are confidential and extremely helpful to this project.

1. Things I liked best about taking a remote site or a traditional class:

2. The things I like least about taking a remote site or a traditional class:

- 3. Improvements that could be made to the learning experiences in a remote site or a traditional class:
- 4. My expected grade in this course (Circle one) A B C D F