Perceptions of Online Course Communications and Collaboration

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Abstract

An increasing number of students are choosing online education programs to complete their higher education. Research concludes that student satisfaction and retention are related to program completion. Furthermore, research indicates that physical distance alone does not influence student satisfaction and retention. In this study, we examined those factors associated with student perceptions of online course communications and collaboration at a large, public university located in the southwestern United States. Results indicate that academic program characteristics and whether a student would recommend their program are associated with differences in perception of online course communications and collaboration.

Perceptions of online course communications and collaboration

In the fall of 2005, more than 3.1 million U.S. college students took at least one higher education course online (Allen & Seaman, 2006, p. 5). An increasing number of students are choosing distance education programs to complete this long term commitment to higher education. Characteristics of this population of students vary, yet students who elect face-to-face instruction typically "tend to be older, and often hold additional employment and family responsibilities" (Allen & Seaman, 2006, p. 1). This growing population of students may be seeking learning experiences in higher education that offer greater accessibility to courses and increased flexibility in scheduling that allows them to accommodate family and work obligations. Given these varied characteristics, distance students may have unique learning needs, which may contribute to higher rates of attrition (anywhere from 10 to 20% higher) than students enrolled in traditional, face-to-face courses (Carr, 2000).

The aspect of physical distance between student, instructor, and other students alone, however, does not appear to explain why students enrolled in courses offered at a distance have higher rates of attrition. In a study of 326 adult learners, Rovai (2002) found no differences in program satisfaction and sense of community among those students enrolled in face-to-face courses and those students enrolled in the same courses offered at a distance. Students enrolled in either an online or face-to-face course format appeared to be similarly satisfied and have similar senses of community. In a meta-analysis of twenty-five studies, Allen, Bourhis, Burrell and Mabry (2002) found slight differences in the satisfaction levels of students enrolled in courses offered face-to-face and at a distance ($r = .031$, $p < .05$).

Because dissatisfaction with the degree of physical distance does not appear to exclusively explain higher rates of attrition among students enrolled in courses offered at a distance, the psychological or

transactional distance experienced by students taking courses at a distance should be examined. According to Moore (1993), distance education is a transactional process that occurs between the learner and instructor, who are often separated by both time and space, but always separated by space. This separation by space can create a psychological or transactional distance between the student and the instructor that influences student achievement and retention over and above the degree of physical distance. In view of Heidegger (1962), this transactional distance experienced by instructors and learners would be a function of time elapsed and how individuals experience time rather than the aspect of physical distance or space. Psychological distance is not limited to distance education because large, face-to-face lecture courses have the potential to produce a similar, if not greater, effect between the student, instructor, and fellow students than courses offered at a distance.

Physical proximity appears to enhance student retention and achievement by minimizing perceived psychological distance. For instance, research involving students who live on-campus during their first year in college has demonstrated higher levels of retention than for those students who live off-campus during the same period (St. John, Hu, Simmons, & Musoba, 2001). Additionally, Braxton, Johnson, and Shaw-Sullivan (1997) have suggested that higher degrees of social integration lead to corresponding levels of commitment to the institution. In other words, students with clear social involvement on-campus were found to persist at a higher rate than those who are socially isolated for one reason or another.

Additionally, the medium of communication is indicated as influencing the teaching and learning process in online education. Communication via the medium of writing is typical in online courses. In pointing out several reasons why students drop out of their online programs, Murray (2001) discusses that one of these reasons is the perception that online classes are easier to complete than face-to-face classes. In fact, online courses often require more time for the completion of assigned work and readings than that required by face-to-face classes. In particular, online written communications may be far more time consuming than face-to-face class attendance and assignments. However, these communications are essential to meaningful and quality interactions in the online learning environment and are a pivotal part of the learning process.

The purpose of this study was to examine the association of students' perceptions of online written course communications and collaboration with student gender, academic program classification, and whether a student would recommend their respective program to another student. We hypothesized that student perceptions of online course communications and collaboration would be influenced by student gender, classification of academic program as either *hard* or *soft* (according to Biglan 1973a & 1973b), and whether a student would recommend their program to another student. To achieve the purpose of this study, we examined three research questions. The first research question was to examine whether an association exists between student gender with academic program classification as either *hard* or *soft*. We examined this first question to determine whether males or females were more likely to be enrolled in an academic program offering online courses classified as either *hard* or *soft*.

Our second research question was to examine whether an association exists between student gender and classification of academic program as either *hard* versus *soft* on students' perceptions of online course communications and collaboration. The researchers hypothesize that an interaction effect of student gender by classification of academic program such that male students in academic programs classified as *hard* would have less positive perceptions of online course communications and collaboration than female students in academic programs classified as *soft*. We also hypothesize the main effects of student gender and classification of academic program as either *hard* or *soft* to be significant. We suggest that female students would have better perceptions of online course communications and collaboration than male students given that female student enrollment in programs offered online or at a distance outnumbers male student enrollment (Kamarae, 2001), indicating the possibility of self-selection bias. We also suggest that students in academic programs classified as *soft* would have better perceptions of online course communications and collaboration than those students in academic programs classified as *hard*. The third and final research question was whether there are differences in student's perceptions of online course communications and collaboration based upon whether a student would recommend their academic program to another student. The researchers reasoned that students who would recommend their program to another student would be associated with better perceptions of online course

communications and collaboration.

Method

Participants

Our study consisted of a sampling frame of 628 unduplicated students with working (e.g. deliverable) e-mail addresses from the Fall 2005 academic semester enrolled in distance courses at a large, public university located in the southwestern United States. These distance programs offered at Texas Tech University are especially relevant for study, given the geographical breadth of the immediate service area being approximately 131,000 square miles, "which exceeds the area served by the educational system of any state other than California, Alaska, and Texas," (Paton, 2006, p. 26). Of these students taking distance courses, 231 self-selected to complete the survey online by responding to a recruitment e-mail message. Participants were informed as to the voluntary nature of the survey study. Participants were also assured as to the confidentiality of their responses. The majority of the students were classified as graduate students (94.2%, $n = 196$). Approximately thirty-six percent of the participants identified themselves as male ($n = 76$) and 82.6% as white ($n = 172$). The student gender distribution (37%, $n = 76$ males versus 63%, $n = 132$ females) in this study is representative of those enrolling in distance education courses across the nation (Kamarae, 2001, p. 4) and of the 57.4% of females in U.S. higher education in the Fall of 2005 (Digest of Educational Statistics, 2006, Table 175). The student ethnic distribution in this study was representative of the student population of the university studied. A total of 24 different academic degree programs were represented as depicted in Table 2.

Measures

To measure student perceptions of online course communications and collaboration, the researchers constructed an 11-item scale with a 5-point Likert-type response format with values ranging from strongly agree (5) to strongly disagree (1). Higher total scale scores on this scale indicate more positive perceptions toward online course communications and collaboration while lower total scale scores indicate less positive perceptions. This 11-item scale revealed an acceptable internal consistency of scores obtained from the scale with $\alpha = .918$. Nunnally (1978) has suggested that score reliability of .70 or better is acceptable when used in basic social science research, such as in this study. An exploratory factor analysis using principal axis factoring as the method of extraction followed by a Promax rotation (Kappa = 4) revealed a one-factor solution accounting for 67.48% of the variance. An oblique rotation (e.g. Promax) was performed as our inter-item correlations were moderate ranging from .30 to .62 and were all significant at the .05 level. Visual examination of the Scree plot supported the conclusion of a one-factor solution. Table 1 reports the structural coefficient (or factor loading) for each item along with extracted commonalities ($h2$). Results of the exploratory factor and reliability analyses indicate evidence towards the reliability and validity of the scale scores in this study.

Table 1. Factor Structure for Online Course Communication and Collaboration Scale

Item	Factor 1	*h*2
Q1: Online communications with my instructor helped with the learning process in online courses.	.532	.470
Q2: Online communications with my classmates helped with the learning process in online courses.	.871	.872
Q3: I felt like I was part of a community with my classmates in my online courses.	.896	.895
Q4: Using online communications tools helped me feel a sense of community with my classmates.	.903	.927
Q5: Collaborative lessons (or group activities) help me feel a sense of community with my classmates.	.679	.496
Q6: Online classes that do not use communications between students make me feel isolated from my classmates and/or alone.*	.835	.674
Q7: Online classes without collaborative group activities make me feel isolated from my classmates and/or alone.*	.793	.743
Q8: The connections or relationships I make in one online class carry over to	.740	.566

other online classes.		
Q9: I communicate online with my classmates even when the assignment does not require it.	.825	.797
Q10: I will keep in contact with some of my classmates when my course/degree is finished.	.812	.930
Q11: A sense of community among online students is important to their satisfaction and success.	.553	.474
* indicates negatively-scored items to be reverse-coded		

To classify each academic discipline, the different programs represented were categorized as either a *hard* or *soft* discipline according to Biglan's classification system (Biglan, 1973a & 1973b). In surveying 168 faculty, representing 36 different academic disciplines, Biglan (1973a) asked faculty to classify each academic discipline "on the basis of the similarity of the subject matter," (p. 196) as deemed by the faculty members studied. The categorization of a discipline as *hard* or *soft* refers to the degree of paradigmatic development of a field (Biglan, 1973a & 1973b). Disciplines such as chemistry, biology, and mathematics, for example, were categorized as *hard*, and disciplines such as political science, psychology, and fields in the fine arts were categorized as *soft*. Sixty-eight of the programs of the participants were classified as *hard*,and 140 programs of the participants classified as *soft*. None of the programs could be categorized as *pure*, according to Biglan's classification system. If a student's academic program could not be classified according to Biglan's system, the response was removed from the analysis, which resulted in twenty-three individual responses being omitted. The total remaining sample size consisted of 208 participants. Those programs which could not be classified as *hard* versus *soft* included two: the multidisciplinary and general studies programs. Table 2 reports those twenty-two academic programs of the participants that were studied, and how those programs were classified as either *hard* versus *soft* or *pure* versus *applied* according to Biglan's (1973a & 1973b) classification system.

Table 2. Programs classified according to Biglan's framework

	Hard	*Soft*
Pure	NA*	NA
Applied	• Agriculture • Computer Science • Crop Science • Engineering • Horticulture • Software Engineering • Systems and Engineering Management	• Agricultural Education • Educational Diagnostician • Educational Leadership • Gerontology • Human Development Family Studies • Instructional Technology • Language Literacy Education • Master Reading Teacher Preparation • Orientation and Mobility • Principal Preparation • Restaurant, Hotel, and Institutional Management • Secondary Education Teacher Preparation Special Education • Superintendent Preparation • Technical Communication • Visual Impairment

*NA indicates not applicable, no programs could be classified as pure
Note: Two programs were omitted from analysis as they could not be classified.

Procedure

The researchers summed the total score for the online communications and collaboration scale for each individual. The values for two items (Q6 and Q7) were reverse-coded before calculating a total scale score as also noted in Table 1. Any missing values were omitted from analysis by listwise deletion performed in SPSS (v. 12.0). No pattern emerged among the missing data, which were subsequently omitted from analysis.

Analysis

To answer the first research question, a chi-square test was used to examine the association between student gender and academic program classification as either *hard* versus *soft*. In answering the second and third research questions, a three-way analysis of variance was conducted with student gender, classification of academic program as either *hard* versus *soft*, and whether a student would recommend their program to another as the independent variables and the total score on the online communications and collaboration scale as the dependent variable. We also calculated different measures of effect size as appropriate to the analysis conducted. In conducting chi-square analysis to answer the first research question, we calculated the Phi (Φ) coefficient for the 2 x 2 analysis of student gender with classification of academic program as either *hard* versus *soft* (Green & Salkind, 2004). Phi coefficient values of .10, .30, and .50 may be interpreted as small, medium, and large in terms of strength of association. For the three-way analysis of variance, we calculated Cohen's *d*, in which a value of 0.20 may be interpreted as a small effect, 0.50 as a medium effect size, and 0.80 and greater as a large effect size (Cohen, 1988).

Results

Before examining each of the research questions, we have provided descriptive statistics for the dependent variable of interest, perceptions of online course communications and collaboration by student gender, program classification as either *hard* or *soft*, and whether a student would recommend their program to another student as represented in Table 3.

Table 3. Descriptive statistics for Online Course Communication and Collaboration Scale

Variable	Mean	Standard Deviation
Student Gender		
Male	31.51	11.56
Female	28.46	8.69
Program Classification		
Hard	32.79	11.26
Soft	40.19	8.29
Whether a student would recommend their program to another student		
Yes	38.64	9.22
No	23.38	12.89

To examine the first research question, the results from a two-way contingency table analysis indicated a significant association between student gender and academic program classification as either *hard* or *soft*, $\chi 2(1, N = 208) = 21.446$, $p < .001$, $\Phi = .371$. This Phi (Φ) coefficient value indicates a medium association between student gender and academic program classification as either *hard* or *soft*. Male students ($n = 37$) were significantly more likely to be in enrolled academic programs classified as *hard* while female students ($n = 122$) were significantly more likely to be in enrolled academic programs classified as *soft*. Conversely, female students ($n = 10$) were significantly less likely to be enrolled in academic programs classified as *hard* while male students ($n = 39$) were significantly less likely to be enrolled in academic programs classified as *soft*. The high degree of association between student gender and whether or not a student was enrolled in academic program classified as either *hard* or *soft* would suggest the possibility of significant interaction effect in addition to any significant main effect(s).

To answer the second research question, students' self-reported perceptions of online course communications and collaboration do appear to differ as a matter of a program being classified as either *hard* or *soft*, $F(1, 207) = 16.50$, $p < .001$, $d = .75$ while not differing significantly as according to student gender. This value of Cohen's *d* indicates a medium to large association between having positive perceptions of online course communications and collaboration and classification of academic program as either *hard* or *soft*. Students in programs classified as *soft* ($M = 40.19$, $SD = 8.29$) appeared to have significantly better perceptions of online course communications and collaboration than students in programs classified as *hard* ($M = 32.79$, $SD = 11.26$). The interaction between student gender and academic program classification as *hard* or *soft* was not significant, indicating neither female students enrolled in academic programs classified as *soft* nor male students enrolled in academic programs classified as *hard* had significantly differentperceptions of online course communications and collaboration.

In answering the third and final research question, there are differences in student's perceptions of online course communications and collaboration based upon whether a student would recommend their academic program to another student, $F(1, 207) = 19.49$, $p < .001$, $d = 1.36$. This value of Cohen's *d* indicates a large association between having positive perceptions of online course communications and collaboration and whether or not a student would recommend their respective program. Students who would recommend their program to another student ($M = 38.64$, $SD = 9.22$) appeared to have significantly better perceptions of online course communications and collaboration than students who would not recommend their program to another student ($M = 23.38$, $SD = 12.89$). Additionally, no significant association existed between whether a student would recommend their program to another student by gender, $\chi 2(1, N = 208) = 1.175$, $p = .27$ or the classification of academic program as either *hard* versus *soft*, $\chi 2(1, N = 208) = 1.279$, $p = .25$.

Conclusion

The results of this study indicate that those students who have better or more positive perceptions of online course communications and collaboration are: (1) more likely to recommend their program to another student; and (2) are more likely to be in an academic program classified as *soft* according to Biglan (1973a & 1973b). No significant interaction existed between academic program classification as either *hard* or *soft* and whether or not a student would recommend their program to another on perceptions of online course communications and collaboration. Students in academic programs classified as *hard* were not more likely to recommend a program than students in academic programs classified as *soft*. Student gender did not appear to be significant nor interact with other variables on the perceptions of online course communications and collaboration either. These results indicate the possible presence of some other mediating or moderating variables that may explain the significance found in this study. We can conclude that students do differ in their perceptions of online course communications and collaboration in whether they would recommend their program to another student, and whether their academic program could be classified as either *hard* versus *soft*. The results of this research can guide distance learning administrators by pinpointing the need for faculty training in those disciplines classified as *hard* to foster online course communications and collaboration as necessary to improve student satisfaction. Distance learning administrators can highlight this research to evidence the need for building a sense of community in online courses as being related to student satisfaction.

The ability of a student to self-regulate their learning online may be considered a possible mediating variable in student perceptions of online course communications and collaboration. Chief Academic Officers at institutions of higher education across the nation responded to the annual Sloan-C Online Survey and indicated that "a barrier to widespread adoption of online learning" was that "students need more discipline to succeed in online courses" (Allen & Seaman, 2006, p. 13). Research literature has indicated that students who are more able to regulate their learning perform better than those students who are less able to regulate their learning (Schunk & Zimmerman, 1998; Zimmerman & Schunk, 2001). Additionally, students who are highly self-regulated tend to be more highly engaged in their learning than students who are less self-regulated (Karoly, 1993). A high degree of self-regulation would appear to minimize psychological distance as being associated with highly engaged student behaviors. Students who are more able to regulate their learning in online curriculum and instruction by self-monitoring, planning, and other self-evaluative techniques may have better perceptions of online course communications and collaboration. Students who struggle to plan and manage their learning in the online learning environment may be less positive in their perceptions about online course communications and collaboration. The presence of this mediating variable would indicate the need to assist students in learning self-regulatory strategies in online learning environments. Students in online learning environments could be instructed as to some self-regulatory online learning strategies, such as informing students to check-in online frequently in a "tips" or "frequently asked questions" section in online course materials.

Other mediating and moderating variables may exist which account for the differences in perception of online course communications and collaboration. Moderating variables, such as whether a student's academic program could be classified as either *pure* versus *applied*, may have produced significant differences in online course communications and collaboration perceptions. The researchers observed a lack of academic programs having online courses that could be classified as *pure*, such as English, History, or Mathematics, as from the course offerings of the subject institution. This deficit in online academic courses and programs in disciplines that could be classified as *pure* may be a function of the enrollment behaviors of distance students. However, according to Biglan's (1973a & 1973b) classification system, this lack of *pure* academic programs may be an anomaly exclusive to the data collected or the institution of study. Future research will have to further examine the distribution of *pure* versus *applied* academic programs in the online learning environment.

The quality of online course communications and collaboration, as perceived by students, is indeed important for study in order to improve the delivery of online courses. Future research should examine the impact of other demographic variables, such as instructor gender and discipline classification according to Biglan (1973a; 1973b), on student perceptions of online course communications and collaboration. Instructor gender would appear to be a possible mediating variable that may account for

differences in student perceptions of online course communications and collaboration. Discipline classification as either *hard* versus *soft* (or *pure* versus *applied* if present) may function as a variable mediated by gender and mediating differences in students perceptions of online course communications and collaboration, especially when these students initially matriculate into their online learning programs.

In conclusion, the results of this study indicate an association of students' perceptions of online written course communications and collaboration with academic program classification and whether a student would recommend their respective program to another student. Our hypothesis that student perceptions of online course communications and collaboration would be influenced by student gender, classification of academic program as either *hard* or *soft* (according to Biglan 1973a & 1973b), and whether a student would recommend their program to another student was supported in part (not with respect to student gender). In view of Moore's (1993) theory of transactional distance, our findings suggest that certain disciplines may foster different degrees of psychological or transactional distance among online learners and with their instructors. We suggest that students and instructors in disciplines classified as *hard* may reinforce (either implicitly or explicitly) course communications and collaborations as less than desirable in the online learning process. Certain disciplines may be experiencing higher degrees of transactional distance in online learning, as manifested in part by student perceptions of online course communication and collaborations. This higher degree of transactional distance in turn lends to students being less likely to recommend their program to another. This hypothesis suggesting an interaction of discipline classification (as either *hard* or *soft*) and degree of transactional distance experienced has yet to be examined in the literature. The degree of transactional distance experienced by students and instructors in disciplines classified as *hard* in online learning may only be a heightened version of the transactional or psychological distance experienced by students and instructors in the face-to-face course format for these disciplines.

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