2009

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Original Publication Citation

Liu, S. Y., Gomez, J., & Yen, C.-J. (2009). Community college online course retention and final grade: Predictability of social presence. *Journal of Interactive Online Learning, 8*(2), 165-182.

Volume 8, Number 2, Summer 2009
ISSN: 1541-4914

Community College Online Course Retention and Final Grade: Predictability of Social Presence

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Abstract

This study employed a quantitative research design to examine the predictive relationships between social presence and course retention as well as final grade in community college online courses. Social presence is defined as the degree of one's feeling, perception and reaction to another intellectual entity in the online environment. Course final grades included A, B. C, D, F, I, or W. Course retention was defined as successfully completed a course with an A to C grade. The results of the binary and ordinal logistic regression analyses suggest that social presence is a significant predictor of course retention and final grade in the community college online environment. Two effective interventions are recommended: establishing integrated social and learning communities; and building effective blended learning programs.

Introduction

The mission of community colleges is to serve all segments of society through a flexible and open admission policy (Vaughn, 1999). Community colleges serve students with life and time conflicts and students with multiple jobs and responsibilities. These unique features make community colleges a setting in which online courses can flourish (Summers, 2003; Muse, 2003). Online courses are defined as having at least 80% of the course contents delivered online and typically without face-to-face meetings (Allen & Seaman, 2005). Over ninety percent of community colleges offered online education courses in 2001 (Waits & Lewis, 2003). Unfortunately, research suggests that online course retention rates are low and existing research does not provide a well-developed understanding of the unique characteristics of students who persist and succeed in online courses, especially at the community college level (Summers, 2003; use, 2003; Corbeil, 2003; IHEP, 1999).

Community colleges face problems due to the lack of information on online student retention. Without this information, they cannot effectively support online students without

knowing specific characteristics that lead to the success or failure in online education (Muse, 2003). Lacking effective interventions, such as counseling, training, support, and course design, community college online education retention rates would remain low (Summers, 2003),resulting in a potential loss of revenue. This potential loss of revenue, when large numbers of community college online education students drop out, has often been an issue (Kember, 1995; Parker, 1999; Summers, 2003). The loss of revenue has had a negative impact on the economic survival for some community colleges (Summers, 2003). Community college students have also faced problems due to the lack of information on online student retention. Without a better understanding of online learning competencies, some students have encountered difficulties in preparing themselves for online courses. Students who were not prepared to take online courses were at a disadvantage and were at-risk in the community college online learning environment. These problems suggested the need for research to understand the characteristics of students who succeed in community college online courses.

This study investigated to what extent students' social presence predicted their retention, and final grades in community college online courses. Section two presents the theoretical framework of the study while the section three outlines the research questions. Section four describes the research method and section five presents the statistical analysis results. Section six discusses recommendations and the final section summarizes this study.

Theoretical Framework

Researchers have developed several theoretical frameworks to attempt to explain the relationship between a range of factors and learning outcomes such as student retention and final grade (Bean, 1985; Garland, 1993; Jun, 2005; Khan, 2005; Kember, 1995; Long 1989, 1992; Osborn, 2000; Powell et al., 1990; Tinto, 1975; Wang & Newlin, 2002). Potential factors fall into a few major dimensions: demographic; psychological; academic; sociological, and technological. This study investigates the relationship between student's social presence and learning outcomes as indicated by course retention and final grade in a community college online environment. Social presence is defined as the degree of one's feeling, perception and reaction to another intellectual entity in the online environment (Tu, 2002a, 2002b). Course retention is defined as: enrolling in a course after the course census date and successfully completing the course with an A to C grade at the end of the term. Using the census date, the end of add/drop period, gave time for a student to determine whether or not to stay in a specific course. After the census date, it is assumed that a student has made a commitment to the course.

Tinto (1975, 1987, 1993) suggested that the college classroom was the crossroads where the social and the academic met and that inquiries about learner success and retention should begin with questioning the influence of social presence and educational activities within the classroom. Tu (2002a, 2002b) asserted that social presence was a complicated construct and involved privacy, social relationships, communication styles, nature of the task, feedback, and immediacy, among other items. The greater the perception that social presence existed, the better the ability to substitute telecommunications media for face-to-face encounters and still achieve the desired collaborative outcome (Tu & McIsaac, 2002). When the degree of social presence was high, interaction would be high, which led to better learning outcomes. As a result, social presence was a key factor in learner social readiness. This study used the Social Presence and Privacy Questionnaire (Tu, 2002a, 2002b) to measure social presence in the following areas:

- Social Context— It consisted of the variables involving the online environment characteristics and users' perceptions of the online environment as a social form, an informal and casual way to communicate, a personal communication form, and a sensitive and comfortable means to interact with each other.
- Online Communication— It consisted of the attributes of the language used online and the applications of that online language. The online communication included concepts such as: online environment conveyed feeling and emotion, and the language used in the online environment was stimulating, expressive, meaningful, and easily understood.
- Interactivity— It included the activities in which online users engaged and the communication styles they used. Interactivity consisted of notions such as: online environment is pleasant, immediate, responsive and comfortable when dealing with familiar topics.
- System Privacy— It included notions such as: the system operator or someone else may re-post messages sent to or from an individual; someone may accidentally send and receive messages rather than the intended recipients; online environment was technically reliable; possibility of embarrassment; and identity concerns.
- Feeling of Privacy— It included notions such as: confidential means, importance of privacy, level of security/secrecy, risk of sharing personal topics and professional embarrassment.

The Social Presence and Privacy Questionnaire were based on a computer-mediated communication attitude instrument (Steinfield, 1986) and an instrument measuring perceived privacy (Witmer, 1997). Content validation was conducted by asking five experts to perform an item-matching task. In a construct validity study (Tu, 2002a), respondents (n = 310) completed the questionnaire, and factor analysis was performed on the resulting data. Five factors listed above were extracted: social context, online communication, interactivity, system privacy, and feeling of privacy. High Cronbach's alpha values were reported for all factors ranging between .74 and .85. A significant correlation was found between social presence and privacy. Significant inter-correlations were found between all factors. It was concluded that all subscales could be collapsed into a single construct.

Research Questions

This study aims to promote a better understanding of student characteristics that may be predictive of retention, and final grade in community college online courses. Specifically, this study examines to what extent students' social presence predicts their retention and final grades in community college online courses. Therefore, the current study addressed two major research questions:

1. Can social presence predict online course retention in a community college?
2. Can social presence predict online course final grade in a community college?

The results of this study would potentially assist community colleges in identifying at-risk online students so that intervention measures can be developed to improve these students' likelihood of academic success. Student retention and grade are key measures of educational

effectiveness and have become a matter of economic survival for some community colleges (Summers, 2003; Webster & Hackely, 1997). For community colleges to develop online courses that effectively meet student needs and eventually increase course retention and improved final grades, it is critical to investigate characteristics separating the successful students from those who dropped out or failed.

The results of this study would also assist students in self-assessing their aptitude and competencies for engaging in online learning courses. Research suggests that students need more discipline to succeed in online courses than in face-to-face courses (Allen & Seaman, 2005). Students in a community college online environment are responsible for their own learning because they cannot rely on the direct interaction with their instructors, peers, and other campus resources (Boyles, 2000; Kember, 1995; Summers, 2003). Consequently, students in an online learning environment control their own educational experience and pace. It is therefore critical for community colleges to provide effective mechanisms for their online students to identify, develop, or prepare skills and aptitudes necessary to successfully complete an online course.

Method

This study employed a predictive quantitative research design to examine the predictive relationships between: (1) social presence, and course retention; (2) social presence, and final grade in students taking community college online courses. The predictor variable is social presence while the criterion variables include course retention and final grade.

Measurements of Research Variables

Predictor variable: Social Presence. This study used the Social Presence and Privacy Questionnaire (SPPQ) (Tu, 2002a, 2002b) to measure the predictor variable, social readiness. The questionnaire was based on an online attitude instrument (Steinfield, 1986) and an instrument measuring perceived privacy (Witmer, 1997). The Social Presence and Privacy Questionnaire consisted of 30 items. Each item consisted of three sub-items to cover asynchronous email communication, asynchronous bulletin board, and real time synchronous discussion environments. The total number of sub-items is 90. Among them, 87 sub-items were rated on a 5-point Likert scale while 3 sub-items were rated on a 2-point scale. Under the 5-point scale, a score of 0 meant that the respondent strongly disagreed with the statement while a score of 4 meant that the respondent strongly agreed with the statement. Under the 2-point scale, a score of 0 meant that the respondent disagreed with the statement while a score of 1 meant that the respondent agreed with the statement. While subscales score were collected, they were not used in the analysis. Tu (2002a, 2002b) concluded that all subscales could be collapsed into a single construct. As a result, a respondent's responses to those 90 sub-items were summed up to obtain a total score, ranging from 0 to 351, to indicate his or her level of social presence.

Criterion variables: final grades and retention. One of the criterion variables, final grade, was based on the class records from online program administration staff at the end of the semester. Course final grades included A, B. C, D, F, I, or W. In this study, students' final grades were divided into 5 groups: (0) F, I, and W; (1) D; (2) C; (3) B; (4) A. Another criterion variable, course retention, was defined as enrolling in a course after the course census date and successfully completing the course with an A to C grade at the end of the term. Using the census date, the end of add/drop period, gave time for a student to determine whether or not to stay in a

specific course. After the census date, it is assumed that a student has made a commitment to the course. Specifically, students' course retention was defined as binary: (0) failed to complete the course; (1) successfully completed the course with an A to C grade.

Data Collection

This study employed a direct data-gathering approach to collect data from participants in a community college. In the second week of classes in the fall of 2006, the Distance Learning office sent out a postcard to each and every online student. The survey was made available the beginning of the third week of classes. The timing was important because there were a lot of course drops and adds during the first two weeks of the semester. The research was designed to survey students who enrolled in a course after the course census date, which is the beginning of the third week of classes. The information on the postcard contained a link that the students could follow to a website. This site contained a demographics questionnaire and the Social Presence and Privacy Questionnaire. Participation by the students in this study was voluntary. Students were provided with information regarding the intent of the research along with a promise that all information collected would remain confidential. Students had to consent to participate in the study by checking the appropriate box before they could continue to complete the survey. A week following the end of the fall semester, course final grades were collected through the Distance Learning office. Due to the Federal Educational Rights and Privacy Act (FERPA), only the final course grades of those students who agreed to participate in the survey were included in the analysis.

Study Participants

Participants in this study were drawn from a population of 2,500 students enrolled in one or more online courses at a suburban community college in Maryland during the fall of 2006. A total of 353 students participated in the survey. Among them, only 108 completed all survey questions. Online courses enrolled varied including Mathematics, Science, Business, English, History, and Psychology. Of the 108 participants in this convenience sample, there were male (n=30, 27.8%) and female (n=78, 72.2%). In terms of marital status, there were single (n=71, 65.7%) and married (n=37, 34.3%). As for the ethnic heritage, there were white (n=54, 50.0%), African-American (n=23, 21.3%), Asian (n=17, 15.7%), Hispanic (n=8, 7.4%), Native American (n=1, 0.9%), and multi-ethnic (n=5, 4.6%). As far as the employment status, there were full-time (n=50, 46.3%), part-time (n=31, 28.7%), and unemployed (n=27, 25.0%). This study used a convenient sample which might not be representative of online students at other institutions. In addition, the low response rate and small cell counts may impact the generalizations.

As far as the employment status, 50 (46.3%) of the subjects indicated that they worked full-time. Thirty-one (28.7%) and 27 (25.0%) identified their employment status as part-time and unemployed, respectively. Table 4 also shows that the majority of the students, 93 (86.1%), had completed their high school diploma or GED equivalency. Twelve (11.1%) of the participants had completed a Bachelor's degree, while 3 (2.8%) had already acquired a graduate or professional degree. In terms of academic intent, the majority of participants, 65 (60.2%), were seeking an AA/AS degree. Seventeen (15.7%) were seeking an A.A.S. degree, and four (3.7%) were seeking an A.A.T. degree. The remaining 22 (20.4%) subjects were classified as seeking a certificate or attending school for other reasons (i.e., personal interests, personal development, professional advancement, etc.). The average age of the subjects was 27.93, with a standard

deviation of 8.546. The minimal age was 17 while the maximum age was 52. Participants' demographics are summarized in Table 1.

Data Analysis

All data analyses were conducted with the SPSS 14.0. An alpha level of .05 was used for all significance tests in this study. First, a binary logistic regression analysis (Cohen, Cohen, West, & Aiken, 2003) was implemented to assess the predictive relationship between social presence, and the binary criterion variable, course retention. Then, an ordinal logistic regression analysis (O'Connell, 2006) was conducted to examine the predictive relationship between social presence, and the ordinal criterion variable, final grade.

In both of the aforementioned logistic regression analyses, statistics of leverage, Cook's distance, and DfBeta (Cohen, et al., 2003) were computed to identify potential outliers with high influences on model estimation. In addition, the parallelism assumption in ordinal logistic regression (i.e., invariance of logistic regression coefficient across different cutoffs in the ordinal criterion variable) was tested with the chi-square likelihood ratio test (Norusis, 2006). According to King (2008), classification tables and prediction accuracy were not to be reported as the goal of this study is not classification.

The chi-square likelihood ratio test (Cohen, et al., 2003) was used to evaluate predictive utilities of social presence for both course retention, and final grade. This study used two descriptive measures for the goodness-of-fit. They were the pseudo R^2 defined by Cox and Snell (1989) and Nagelkerke (1991). The pseudo R^2 was calculated depending upon the likelihood ratio. The pseudo R^2 measured the success of the model in explaining the variations in the data (Peng et al., 2002). The larger the pseudo R^2 was, the better the model fitting.

Results

This section reports the results of statistical analyses. It includes descriptive statistics of research variables, the results of binary logistic regression for predicting course retention by students' social presence and the results of ordinal logistic regression for predicting the final grade by students' social presence.

Descriptive Statistics of Variables

There were 108 subjects in this study. Descriptive statistics of the predictor variable and criterion variables are listed in Table 2 and 3 respectively. Social presence scores range between 105 and 336 with a mean of 242.5 and a standard deviation of 8.98. As of final grades, 51 (47.2%) subjects received a grade of A; 25 (23.1%) received a grade of B; and 12 (11.1%) received a grade of C. The remaining subjects, 3 (2.8%), received a grade of D; 9 (8.3%) received a grade of F; 2 (1.9%) received a grade of I; and 6 (5.6%) withdrew from the course. In terms of course retention, 20 (18.5%) dropped out, while 88 (81.5%) successfully completed a course with an A to C grade at the end of the semester.

Regression Diagnostics and Assumption Checking

Scatterplots of leverage indicated that no case sharply stood out from other cases. Cook's distance statistics were within the normal range of 1 (Belsley, Kuh & Welsch, 1980) and suggested of no case with unusually high influence on the overall regression equation. DfBeta statistics were all within the normal range of ±1 (Belsley, et al.) and indicated that the regression coefficient estimation was not skewed by any individual case.

Research Question 1: Binary Logistic Regression Model

A binary logistic regression model was fitted to the data to answer the research questions regarding the relationship between students' social presence and course retention. The model is represented in the following equation while logistic coefficients are shown in Table 4.

Predicted logit of (Course Retention) = -2.028 + (0.15)* Social Presence

According to the above model, the log of the odds of successful course retention was positively related to the social presence. The result from the Wald test of the regression coefficient associated with the social presence is statistically significant and suggest that social presence is an effective predictor of course retention, the criterion variable.

As shown in Table 5, the results of the chi-square likelihood ratio test lent support to a nonzero predictive relationship between social presence, and course retention, χ^2 (1, N = 108) = 8.051, p < .05. Furthermore, the positive sign of the logistic regression coefficient also indicated that the higher the social presence, the more likely a student would retain in an online course and finish it. Specifically, the log odds (i.e., logit) of course retention was expected to increase by .015 per unit increase in social presence score. The exponent of .015 was equal to 1.015 and represented the odds ratio of course retention for a person with a given social presence score to a person with social presence score 1 less than previous one's. In other words, the odds of course retention would be predicted to increase by 1.015 times per unit increase of social presence score. The Cox and Snell index, and the Nagelkerke index were .072 and .117 respectively in the binary logistic model and supported a nonzero predictive utility of social presence.

Research Question 2: Ordinal Logistic Regression Model

An ordinal logistic regression model was fitted to the data to answer the research question regarding the relationship between students' social presence and course final grade. As indicated by the observed significance levels in Table 6, social presence has coefficient of .011 with observed significance levels of .005. In other words, social presence scores are positively related to probabilities of getting better course final grades. As shown in Table 7, the result of chi-square likelihood ratio test didn't indicate the violation of the parallelism assumption in ordinal logistic regression, χ^2 (3, N = 108) = 3.375, p > .05.

As shown in Table 8, the results of the chi-square likelihood ratio test lent support to a nonzero predictive relationship between social presence, and final grade, χ^2 (1, N = 108) = 7.650, p < .05. The difference between the two -2LLs is 7.650. The significance level of 0.006 indicates that we can also reject the null hypothesis that the model without the social presence is as good as the model with the social presence. In other words, the ordinal logistic model with the

social presence predicts the probability of the course final grade better than the baseline model. The Cox and Snell index, and the Nagelkerke index were *.068* and *.074* respectively in the ordinal logistic model and supported a nonzero predictive utility of social presence.

Implications and Recommendations

This study sought to extend the knowledge base concerning the predictability of social presence in relationship to student course retention and final grade in community college online environments. The results of the binary and ordinal logistic regression analyses suggest that social presence is a significant predictor of course retention and final grade in the community college online environment. The research results lead to two specific recommended actions: early identification and effective intervention. These recommended actions are built on the Seidman (2005) retention formula, which was based on the Tinto (1987, 1993) model. Seidman's retention formula stated that retention is equal to early identification plus early, intensive and continuous intervention. These recommended actions, when applied as a part of a comprehensive retention strategy, have the potential for contributing to the increase in the retention rate in community college online learning programs.

Early Identification

Early identification is identification at the earliest possible time of students who are potentially at-risk for being unsuccessful in the community college online environment. A community college can learn about its students and their specific sociological characteristics by conducting a learner assessment. A battery of autonomous assessment tools can be used and scored immediately using computer adaptive assessment (Braxton & Lien, 2000). They include: the Social Presence and Privacy Questionnaire (Tu, 2002a, 200b), Social Presence Questionnaire of Online Collaborative Learning (Lin, 2003), Social Presence Scale (Gunawardena & Zittle, 1997), and others. A careful assessment and analysis of students will provide important information that a community college can use to design intervention measures for at-risk students.

Effective Intervention

Intervention should be early, intensive, and continuous (Seidman, 2005). Early means starting an intervention at the earliest time possible after identification of a problem. Intensive means providing the student with an experience powerful enough to be effective and to make the desired change in the student's social presence and integration. Continuous means having an intervention that persists until the change is effected. Major recommended elements of a community college intervention strategy are discussed below.

Developing integrated social and learning communities: Community college online students exist in a broad social context, which can profoundly affect online learning retention. Research has shown that learning communities facilitate academic and social integration (Tinto, 1993). Students tend to develop supportive peer groups and find personal support via the interactions that occur within those groups. Student peer groups constitute the core of the social communities of colleges and universities. Hence, these groups also function as mechanisms for social integration (Tinto 1975). Learning communities also foster collaborative learning.

Collaboration allows students to work and learn together to accomplish a common learning goal. In a collaborative environment, students can develop social, communication, critical thinking, leadership, negotiation, interpersonal, and cooperative skills by experiencing the perspectives of other group members. The Web offers extensive opportunities for collaborative learning (Harasim, 1990). Two types of collaboration can be implemented on the Internet: inside collaboration and outside collaboration. Inside collaboration provides a supportive environment for asking questions, clarifying directions, suggesting or contributing resources, and working on joint projects with class members. Outside collaboration provides for the integration of external personnel and resources, such as speakers, guest lecturers, and Web sites, in course activities (Bannan & Milheim, 1997). E-mail, discussion forums, and conferencing tools can be used to facilitate either kind of collaboration. Developing integrated social and leaning communities would increase online students' social integration and readiness, which would, in turn, improve course retention and grade.

Building effective blended learning programs: Learning requirements and preferences of each learner tend to be different. Community colleges must use a blend of learning approaches in their strategies to get the right content in the right format to the right student at the right time (Khan, 2005). Blended learning combines multiple delivery media that are designed to complement each other and promote learning and application-learned behavior. Blended learning programs may include several forms of learning tools such as real-time virtual/collaboration software, self-paced Web-based courses, electronic performance support systems embedded within the task environment, and knowledge management systems. Blended learning mixes various event-based activities, including face-to-face classrooms, live e-learning, and self-paced learning (Khan, 2005). An effective blended learning program should be a mix of traditional instructor-led learning, synchronous collaborative learning, asynchronous self-paced study, and practical learning from an experienced classmate. Building effective blended learning programs would increase interaction, integration, and collaboration, which, in turn, would improve course retention and grade.

Conclusion

In conclusion, community college online students are removed in time and distance from the source of instruction. In addition, most of them have various competing roles and responsibilities. A student with a positive perception of social presence maintains a high degree of interaction and collaboration with peers, and is more likely to successfully complete a community college online course with a better grade.

This study proposes recommended actions for community colleges and online educators to improve the likelihood of student success in an online learning environment. Actions include early identification of at-risk students and effective interventions such as building effective blended learning programs and developing integrated social and learning communities. It is hoped that future work will move toward the development and testing of a comprehensive community college action plan for student retention.

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Table 1
Subject Demographics

		Frequency	Percent	Cumulative Percent
Gender	Male	30	27.8	27.8
	Female	78	72.2	100.0
	Total	108	100.0	
Marital Status	Single	71	65.7	65.7
	Married	37	34.3	100.0
	Total	108	100.0	
Ethnicity	White	54	50.0	50.0
	Native American	1	.9	50.9
	African American	23	21.3	72.2
	Asian	17	15.7	88.0
	Hispanic	8	7.4	95.4
	Multi-Ethnic	5	4.6	100.0
	Total	108	100.0	
Employment	Full time	50	46.3	46.3
Status	Part time	31	28.7	75.0
	Unemployed	27	25.0	100.0
	Total	108	100.0	
Highest	HS Diploma/GED	93	86.1	86.1
Education	Bachelor's	12	11.1	97.2
	Graduate/Professional degree	3	2.8	100.0

Completed	Total	108	100.0	
Academic	AA/AS	65	60.2	60.2
Intent	AAS	17	15.7	75.9
	AAT	4	3.7	79.6
	Certificate/Other	22	20.4	100.0
	Total	108	100.0	

Table 2
Predicator Variable Statistics

		Statistic	**Std. Error**
Social Presence	Mean	239.2963	4.47924
	Median	242.5000	
	Std. Deviation	46.54959	
	Minimum	105.00	
	Maximum	336.00	

Table 3
Criterion Variable Statistics

		Frequency	Percent	Cumulative Percent
Final Grade	A	51	47.2	47.2
	B	25	23.1	70.4
	C	12	11.1	81.5
	D	3	2.8	84.3
	F	9	8.3	92.6
	I	2	1.9	94.4
	W	6	5.6	100.0
	Total	108	100.0	
Course Retention	Dropped	20	18.5	18.5
	Retained	88	81.5	100.0
	Total	108	100.0	

Table 4
Binary Logistic Coefficients

	B	S.E.	Wald	df	Sig.	Exp(B)
Social Presence	.015	.006	7.429	1	.006	1.015
Constant	-2.028	1.265	2.569	1	.109	.132

Table 5
Chi-Square Likelihood Ratio Test for Model Fit

Predictor Variables	Chi-Square	df	Sig.
Social Presence	8.051	1	.005

Table 6
Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[Grade = .00]	.949	.946	1.006	1	.316
	[Grade = 1.00]	1.158	.945	1.501	1	.221
	[Grade = 2.00]	1.816	.952	3.643	1	.056
	[Grade = 3.00]	2.843	.976	8.487	1	.004
Location	Social Readiness	.011	.004	7.917	1	.005

Table 7
Test of Parallel Lines

	Model	-2 Log Likelihood	Chi-Square	df	Sig.
Social Presence	Null Hypothesis	252.096			
	General	248.721	3.375	3	.337

Table 8
Model Fitting Statistics

	Model	-2 Log Likelihood	Chi-Square	df	Sig.
Social Presence	Intercept Only	259.745			
	Final	252.096	7.650	1	.006