Factors Affecting Student Satisfaction in Distance Learning: A Case Study of COMSATS (Virtual Campus)

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Abstract

The aim of this study is to find the level of students' satisfaction with the e-learning. It further explored the correlation between instructor performance (IP), student instructor interaction (SII), course evaluation (CE) and student satisfaction (SS) by taking Virtual COMSATS (VCOMSAT) as a case study. Target population of this research was the VCOMSATS' students. A questionnaire was electronically sent to all the students out of which 251 graduate and undergraduate students responded.

The purpose of this research study was to identify the key factors affecting student satisfaction in distance learning. It was found that students are satisfied with their online learning experience. Significant correlation was found between instructor performance and student satisfaction; student-instructor interaction and student satisfaction, and course evaluation and student satisfaction. The regression analysis depicted that course evaluation was the most contributing factor in student satisfaction followed by performance of the instructor and instructor-student interaction.

Introduction

Distance education is defined as mode of learning in which teacher and students are isolated physically. In this mode teacher and student can interact with each other from remote location. Student can interact with instructor from any place, any location and any time. New delivery method and platforms of education are telephone, radio, postal services, television (TV), and internet.

In these days internet has turned into a profitable educational resource and offers new instructive experience for students, which were impractical earlier. Now a day's web and data innovation has changed the substance of education. In advance education, web instruction is quickly getting to be normal and developing as an open door for conveying training on the web. Now universities can give distance education chance to students who have limited access to higher education opportunity.

According to Sher (2008) the development of online education has been invigorated by the progress of the web and information technology (IT) that changed the substance of training.   . Because of the progression of the most recent innovation, online training has ascended as a choice or if nothing else a huge supplement to routine strategy for learning and teaching (Lewis & Waits, 2004).

Research gap

This study was taken to explore the most recent issue of COMSATS VIRTUAL CAMPUS students in distance education (DE). In Pakistan most of the people perceive that quality of distance learning education is poor. Therefore, we decided to carry out this research study to see if it's only people's opinion or there is any authenticity about poor outcomes of students in distance education.
Secondly, this study was carried out by keeping in view the increasing demand for distance education in Pakistan.

Research objectives

Objective of the study was to understand and explore the relationship between student-instructor interaction, instructor performance, and course evaluation and student satisfaction.

Research questions

To find the relationship between Instructor performance, student instructor interaction, course evaluation and student satisfaction three research questions were used to guide this study.

1- Does course evaluation influence student satisfaction?
2- How student-instructor interactions affect the student satisfaction?
3- Does Instructor performance have any influence on student satisfaction?

Significance of the study

This study was carried out by keeping in sight the rising demand of distance education in Pakistan. Presently there are limited degree awarding universities in Pakistan providing distance education i.e. COMSATS VIRTUAL CAMPUS, Virtual University (VU) and Allama Iqbal Open University (AIOU). In Pakistan most of the people perception that quality of distance learning education is poor.Therefore, we decided to carry out this research study to see if it's only people's opinion or there is any authenticities about the poor quality of education in distance education.. The aim of this study is identify association among student satisfaction and different independent variable in distance education by taking VCOMSATS as a Case study.

Concept of e-learning

Electronic Learning (e-learning) is the utilization of information technology (IT) to disseminate knowledge for training and education (Aixia and Wang, 2011). Different methods of electronic learning are virtual learning, web base learning, circulated learning and network base learning. These are referring to education processes that are utilized in information and communication technology. According to Naidu (2006) electronic learning comprise a lot more than virtual learning, distributed learning, web base learning and online learning. In e-learning "e" stands for dictionary word "electronic" all education activities are included in e-

learning that are carried out by group or individual working offline or online, standalone personal computer or networked or other electronics devices (Naidu,2006). During recent years, e-learning society is seen as vital to the future of education and the help of deep rooted learning. By empowering learners to learn at whatever time and anyplace, enthusiasm for it has been developing for organizations to prepare their workers as well as academic institutions to set up web-course learning frameworks. Adaptable access refers to get to and utilization of data and assets at a place that is suitable and helpful to individual learners as opposed to the educator and/or the instructive association. Versatile access alludes to get to and usage of information and resources at a place that is helpful and suitable for the individual learners rather than instructor and the educational affiliation. It permits distance learners, to be in full or part time vocation.

Learner satisfaction in e-learning

E-learning is a recent mode of higher education. After initial experience there are many students who stop their online learning and students' early apparent fulfillment with technology based e-learning decides whether they will utilize system continuously.

Factors that influence student satisfaction

There are different factors that influence on students' satisfaction. Those are instructor-related, student related and technology related

Instructor-related factors

According to Finly-Neuman, 1994; Williams and Ceci, 1997 the teacher is the important predictor in course satisfaction. Instructor becomes a motivator and facilitator for student. Instructor feedback is key factor in satisfaction with student. DeBourgh, (1999) and Hiltz, (1993), instructor performance and his/her availability and response time are highly associated with student satisfaction.

Student-related factors

In online learning there is an open door for students to interface in exceedingly intelligent correspondence with the teacher and their companions (ADEC, n.d.; Betts, 1998; Sloan Consortium, 2006). There is

reason that workforce like to show online is that online instruction bears access to advance education for varied type of student population (ADEC, n.d; Betts, 1988; Rockwell et al.; 1999; Sloan Consortium, 2006). As indicated by Bower, (2001) some employees express worry about restricted communication with students where they never meet face-to-face to the student. The level of personnel fulfillment is high in which course student execution is better (Frederickson et al., 2000; Hartman et al., 2000).

Technology-related factors

Chen & Huang (2012) expressed that understanding student mentalities can extend e-learning frameworks and address student issues which ought to further build the effect of learning and improve fulfillment with the learning process. Student fulfillment with e-learning situations was inspected in a few studies (Sasidharan, Santhanam, 2008; So & Brush, 2008; Wu and Hsia, 2010, Zhu, 2012). Helpful learning environment and execution desires influence student fulfillment and execution desire give the best commitment to learning fulfillment. Teacher and student will hold inspirational state of mind towards e-learning on the off chance that they realize that it would offer them some assistance with improving their exhibiting learning adequacy and effectiveness (Rehmat et al., 2012; Wu, Tennyson, & Hsia, 2010).

Interaction in distance learning

Communication process between human and non-human for example human-computer interaction is called interaction. According to Moore, 1989; in distance education three types of interaction exist that are: (a) learner-to-learner interaction (b) learner-to-content interaction (c) learner-to-instructor interaction.

Benbunan-Fich, et al., (2005) proposed the online interaction theory for online learning environment that defines the procedure and result in online learning. 3P model specially applies to both classroom and online learning. Benbunan-Fich, et al. (2005) 3P models consist of 3 processes (a) input (b) learning process and (c) output. Benbunan-Fich et al., (2005) representation spotlight on the part of communication element at the phase of learning with a specific end goal to expect yield of learning. Model of Biggs (1979); focus on student ways to deal with

instructing in the learning system in desire of output of learning. Student, instructor, technology and course are Inputs factors that influence on online learning satisfaction. All these factors are moderator variables that effect in the learning technology that are adopted for special subject.

Student satisfaction from student-instructor interaction

As indicated by numerous analysts, the overall achievement and effectiveness of online training relies on the interaction which is a vital component to student learning (Fresen, 2007; Northrup, 2001; Moore, 1993). Along these lines, Volery et al.; (2000) recommended that keeping in mind the end goal to support students' interaction; the teacher may give a cooperation remark. Besides, instructor ought to have the capacity to comprehend the various ways of student learning, include them in online talks and urge student to student interaction (Durling, Johnson, Cross, 1996).

In distance education interaction is vital part of learning. In education student-instructor interaction is hence common that is basic requirement for learning (Garrison and Anderson, 1995; Picciano, 2002. Three type of interaction is reported by Moore (1989) that is, student to student, student to content, and student to instructor. All these types of interactions are important for satisfaction of students in distance education (Young & Norgard, 2006). Interaction quality between students and their instructor, student and course content and student-student are important. Student-instructor interaction was the most important factors in online studies (Battalio, 2007).

Student satisfaction from course evaluation

Michailidou and Economides, (2003) state that the change of an online domain permits students to take interest for the informative techniques.. Especially the subjects that include dialogue, conceptualizing, and reflection are most appropriate to the online learning (Wells, 1992). A standout amongst the most vital elements of distance education is student's interaction through course discussions (Shea, Swan, Maher, and Pickett, 2000). Irani, (1998) course plan should have loaded correspondence prospective, because correspondence level sensibly affects understudies' learning, fulfillment and support in web courses.

Swan et al. (2000) conducted that student favored reliable course structure with the goal that route does not change starting with one course then onto the next. As per Levin et al., (1990) students see that dialogues in separation learning are most impartial and fair than up close and personal talks. Student got to be disappointed when their courses were inadequately outlined, and when educators did not take an interest in talks or reacted inside of an exceptionally constrained time (Yang and Cornelius, 2004; Perris and Zeng, 2004). As per Sahin (2007) there might be probability that this dissatisfaction might unravel into a poor learning results for students. In this manner, in online education, receiving student's criticism about their requirements and inclinations is essential for the fruitful configuration and execution of this atmosphere.

Methodology

This study was focused on key factors affecting student satisfaction in distance learning education. In this study student satisfaction was taken as dependent variable and Student instructor interaction (SII), Instructor performance (IP) and Course evaluation (CE) was taken as independent variable that impact on student satisfaction in distance learning at VCOMSATS

Conceptual framework

The conceptual model is shown below that was made on the basis of literature review and introduction.
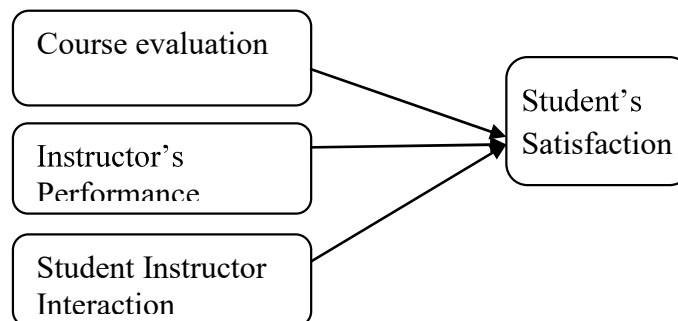
Adopted from Ali. A., & Ahmad I., (2011)

Figure conceptual framework research model
    The above diagram shows the dependent and independent variable as below:

Criterion variable
1. Student's Satisfaction

Predictors
1. Course evaluation
2. Instructor Performance
3. Student-instructor interaction.

Research hypothesis
    The following hypotheses have been developed from the literature review:

    H1: Instructor performance is positively related to the student's satisfaction.

    H2: Student-instructor interaction is positively related to the student's satisfaction.

    H3: Course evaluation is positively related to the student's satisfaction.

Research method
    There are different types of research data: 1- Primary data 2- Secondary data. Primary data is original data that is first hand data collecting through survey and observation. Secondary data is based on existing research, newspaper, academic books and journals. This study contains primary data collected through quantitative research.

 Questionnaire survey
    Questionnaire survey is the most popular and the most useful instrument in quantitative research. This method has some advantage on other research method like observation, interview. In this method researcher can gather lot of data in less time frame. This method is also

cost-efficient as compared to other methods. In this study we used online survey for data gathering.

Sampling technique

Sampling is defined as identifying group of participants from target population that were used in research. From sample data is collected for research because it is not possible to get data from the whole population. The population size of this research was all the students of COMSATS VIRTUAL CAMPUS. There are different methods for sampling like probability sampling and non-probability sampling and every technique has some advantage and disadvantage. In this study we used probability sampling technique. For questionnaire we created online Google form. For accurate data collection we create password protected form for only COMSATS VIRTUAL CAMPUS students to be filled in one attempt. After creation the form we generated the web link and sent this link to admin of virtual COMSATS for sending the email to all COMSATS VIRTUAL CAMPUS students. Admin received the mail and sent it to all COMSATS VIRTUAL CAMPUS students because only moderator of the list can send the email on students' groups. We received response of 251 undergraduate and graduate students of COMSATS VIRTUAL CAMPUS from session FA12 to SP15. Students responds was collected in excel form and download the excel file and used for further analysis.

Research instrument

To address the research questions all questions were based on the work of Arbaugh (2000) and Ali, & Ahmad, (2011). The questionnaire was comprised of 26 items. It was contained on two parts. First part contained on demographic information and the second part contained the variables and their items. The demographic profile included four items: Gender, age, student type and educational level. Student satisfaction was measured with six questions, student instructor interaction with five questions, instructor performance with nine questions and course evaluation with six questions. Each of the items measured using five-point Likert-type scales, ranging from 1(strongly disagree) to 5 (strongly agrees).

Data analysis

Data was analyzed using different tools and techniques. In this research the collected data were analyzed using descriptive analysis, correlation analysis, and regression analysis and cross tabulation between different variables. Correlation coefficient was used to measure the relationship between dependent and independent variable. Cross tabulation was used to measure the statistics of one variable with other variables.

Data analysis and discussions

This study was focused on key factors affecting student satisfaction in distance learning education. In this study student satisfaction was taken as dependent variable. Student instructor interaction (SII), Instructor performance (IP) and Course evaluation (CE) were taken as independent variables.

Descriptive analysis

Table 1 presents the students demographic profile. It shows that 187 (74.5 %) male and 64 (25.5 %) female students' responded.. Full time students were 65 (25.5 %) and part time students were 186 (74.1 %) that participated in the survey.

Table 1
Demographics of the Sample

Variable		N	%
Gender	Male	187	74.5
	Female	64	25.5
Student Type	Full time	65	25.9
	Part time	186	74.1
Age	20-25	65	25.9
	26-30	93	37.1
	31-35	43	17.1
	36-40	29	11.6
	Above 40	21	8.4
Academic Program	Bachelor	30	12.0
	Master	180	71.7
	Other	41	16.3

Total sample size = 251

Reliability analysis

      Table 2 reveals that after collecting the data Cronbach alpha was used to verify the reliability of the data. Student's satisfaction and its determinants have good internal consistency. Research showed that scale was reliable because the Cronbach alpha was 0.877, 0.885, 0.929 and0 0.897 are greater than 0.8 and showed internal consistency in the scale.

Table 2
Descriptive Statistics and Cronbach Alpha

Variable Name	Items	Mean	Std. Deviations	Cronbach Alpha
Student Satisfaction	6	3.655	.889	.877
Student-Instructor Interaction	5	3.298	1.0162	.885
Instructor Performance	9	3.537	.944	.929
Course evaluation	6	3.817	.895	.897
Total Sample size n= 251				

      Table 2 also reveals the means and standard deviation results of all dependent and independent variables. The means of student satisfaction, Student instructor interaction (SII), Instructor performance (IP) and Course evaluation (CE) was greater than 3.0.

Correlation analysis

      Using correlation matrix researchers find the results of hypotheses as presented in table 3.

Table 3
Correlation

	Student satisfaction	Student instructor interaction	Instructor performance	Course evaluation
Student satisfaction	1			
Student Instructor Interactions	.463**	1		
Instructor Performance	.620**	.670**	1	
Course Evaluation	.696**	.453**	.686**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson Product Moment Correlation was used to identify the relationship between the dependent variable (student satisfaction) and independent variables (Student instructor interaction, instructor performance and course evaluation). The value of significance is represented as * p< 0.05, **p<0.01 and ***p<0.001.

H1: Instructor performance is positively related to the student's satisfaction.

In table 3 Pearson correlation value for instructor performance and student satisfaction was r=0.620. So we can conclude that there is strong positive relationship between instructor performance and student satisfaction. The value of significance was less than p<0.01 it means there was statistically significant relationship between instructor performance and student satisfaction.

H2: Student-instructor interaction is positively related to the student's satisfaction.

Pearson correlation value for student instructor interaction and student satisfaction was r=0.463. So we can conclude that there was strong positive relationship between student- instructor interaction and student

satisfaction. The value of significance was less than $p<0.01$. it means there was statistically significant relationship between student-instructor interaction and student satisfaction.

H3: Course evaluation is positively related to the student's satisfaction.

Pearson correlation value between course evaluation and student satisfaction was $r=0.696$. So we can conclude that there was strong positive relationship between course evaluation and student satisfaction. The value of significance was less than $p<0.01$. It means there was statistically significant relationship between course evaluation and student satisfaction.

Regression analysis

Table 4
Impact of Student instructor interaction, Instructor performance and Course evaluation on Student satisfaction

Variable name	R 1	R 2	R 3	R 4
Student Instructor Interaction	.414*** (.050)			.082*** (.053)
Instructor Performance		.612*** (.049)		.205*** (.071)
Course Evaluation			.724*** (.047)	.533*** (.062)
Constant	2.363*** (.175)	1.538*** (.182)	.927*** (.188)	.662*** (.190)
Test Diagnostic				
R^2	.214	.385	.485	.528
Adjusted R^2	.211	.382	.483	.522
F Value	67.869	155.636	234.478	92.097
P value (sig)	0.000	0.000	0.000	0.000

Standard error in parenthesis, ***, ** and * represent statistical significance at 0.01, 0.05 and 0.1 level.

Linear regression and multiple regression were used to analyze the impact of independent variables on dependent variable. In table 4 Column R1, R2 and R3 reveals the regression value of independent variables i.e. student instructor interaction, instructor performance and Course evaluation respectively. Column R4 showed the multiple regression value of all the variables.

In table 4 co1umn R1 reveals that if there is one unit increase in student instructor interaction it leads to 0.414 unit increases in student satisfaction. This result is statistically significant at 0.01% level of significance. R^2 shows that 21.4 percent variation in dependent variable is explained by student instructor interaction. Probability of F stat is below 10% which shows that model is statistically correct.

In table 4 columns R2 reveals that if there is one unit increase in instructor performance   it leads to 0.612 unit increases in student satisfaction. This result is statistically significant at 0.01% level of significance. R^2 shows that 38.5 percent variation in dependent variable is explained by instructor performance. Probability of F stat is below 10% which shows that our model is statistically correct.

In table 4 Regression3 reveals that if there is one unit increase in course evaluation it leads to 0.724 unit increase in student satisfaction. This result is statistically significant at 0.01% level of significance. R^2 shows that 48.5 percent variation in dependent variable is explained by course evaluation. Probability of F stat is below 10% which shows that our model is statistically correct.

In the above table column R4 showed the results of multi regression that if there is one unit increase in student instructor interaction, instructor performance and course evaluation it leads to 0.082, .205 and .662, respectively unit increase in student satisfaction. This result is statistically significant at 0.01% level of significance. The overall Probability of F stat is below 10% which shows that our model is statistically correct.

Questionnaire analysis

Table 5
Key Factors for Determining Student Satisfaction

Item number/question	SD%	DA%	N%	A%	SA%
Instructor Performance					
Overall instructors were effective	6.8	7.6	31.1	39.4	15.1
The instructors were available for consultation during office hours or by appointment.	7.2	12.4	33.9	28.7	17.9
The instructors stimulated students learning	6.0	16.7	33.1	30.3	13.9
The instructors treated all students fairly	3.2	11.6	27.5	33.9	23.9
The instructor treated all students with respect	5.6	4.4	17.1	41.8	31.1
The instructor welcomed and encouraged questions and comments	2.8	10.0	25.9	36.3	25.1
The instructor presented the information clearly	4.8	9.6	24.7	38.2	22.7
The instructor emphasized the major points and concepts.	4.4	12.0	22.7	38.6	22.3
The instructor demonstrated knowledge of the subject	4.0	9.2	24.7	39.4	22.7
Course Evaluation					
Overall, I have valuable learning experiences from my courses	4.8	8.0	19.1	43.4	24.7
The assignments were relevant and useful	3.2	5.2	16.7	40.6	34.3
Course materials were relevant and useful	4.0	6.8	13.9	43.4	31.9
Expectations were clearly stated either verbally or in the syllabus	2.8	11.2	21.5	39.0	25.1
The testing and evaluation procedures were fair.	2.4	7.2	17.9	45.8	26.7

The workload was appropriate for the hours of credit	6.4	10.0	19.5	41.0	23.1
Student Instructor Interaction					
The instructors encouraged me to become actively involved in the course discussions	11.2	16.3	24.7	31.5	16.3
The instructors provided me feedback on my work through comments	12.4	13.9	23.5	33.1	17.1
I was able to interact with the instructors during the course discussions	8.8	10.8	27.1	35.5	17.9
The instructors treated me individually	8.8	17.9	21.1	34.3	17.9
The instructors informed me about my progress periodically	13.1	17.9	23.9	28.7	16.3

Total sample n= 251
Where SD means strongly disagree, D=disagree , N= neutral, A= agree, and SA=strongly agree

Table 5 shows the results of key factors that determined the student satisfaction in distance learning education.

Conclusion

The purpose of this research study was to understand the key factors affecting student satisfaction in distance learning. From literature review it was found that in distance learning education student satisfaction is based on instructor performance, student-instructor interaction, course evaluation, Learning management system use, instructor attitude etc. From literature review we found that course evaluation and instructor performance is very important for student satisfaction in distance learning.

Researchers collected the primary data and analyze the finding that were based on the questionnaire and found the students were very satisfied from instructor performance, course evaluation and student-instructor interaction. It is also verified that there is a strong relationship between student satisfaction and independent variables instructor performance,

course evaluation and student-instructor interaction. In literature review people perceived that distance learning is poorer than the traditional learning but this study did not support the literature as students are satisfied in distance learning education because there is no need to attend classes physically and student can continue study with jobs.

Means and standard deviation was calculated and mean values of all the variables show the acceptability with means greater than the median. Students were also satisfied in distance learning at VCOMSATS that instructor were motivated, intelligent, cooperative with students, courses were up to date, easy to learn and instructor communication with students.

The real finding of the prevailing force anticipating student fulfillment with online courses is collaboration as opposed to data and quality. This should be a wakeup call for instructors, administration and course designer who trust data quality. Finding shows that learner content interaction was the strongest forecaster of student satisfaction, as previous finding of Keeler and Chejlyk (2006). Second strongest forecaster is learner-instructor interaction that considerably contributed to student fulfillment. So design of the online content is more important factor for student satisfaction.

References

About CIIT | COMSATS Institute of Information Technology, Virtual Campus. (n.d.). Retrieved March 05, 2016, from http://vcomsats.edu.pk/aboutus

Afzaal Ali & Israr Ahmad, (2011). Key factors for determining students' satisfaction in distance Learning Courses: A study of Allama Iqbal Open University contemporary educational technology, *2*(2), 118-134.

Aixia, Ding, and Dan Wang (2011). Factors influencing learner attitudes toward E-learning and development of E-learning environment based on the integrated E-learning platform. International Journal of e-Education, e-Business, e-Management and e-Learning, 264-68

Allen, I.E., & Seaman, J. (2007, October). Online nation: Five years of growth in online learning.

Needham, MA: Sloan-C. Retrieved December 28, 2008, from http://www.sloanconsortium.org/publications/survey/pdf/online_na tion.pdf

American Distance Education Consortium (ADEC). (n.d.). Quality framework for online education. Lincoln, NE: Author. Retrieved December 28, 2008, from http://www.adec.edu/earmyu/SLOANC41.htm

Andersen, Jeffery C., (2013). Learner satisfaction in online learning: An analysis of the perceived impact of learner-social media and learner-instructor interaction . Electronic theses and dissertations. Paper 1115. http://dc.etsu.edu/etd/1115

Anderson, Rolph E. (1973). Consumer dissatisfaction: The effect of disconfirmed expectancy on perceived product performance. Journal of marketing research, 38-44

Anderson, T. (2003). Modes of interaction in distance education: Recent developments and research questions. In M. Moore (Ed.) Handbook of distance education, 129- 144. Mahwah, NJ.: Erlbaum.

Anderson, T. D. & Garrison, D. R. (1995). Transactional issues in distance education: The impact of design in audio teleconferencing. The American Journal of Distance Education, 9, 27–45.

Arbaugh, J. B., & Benbunan-Fich, R. (2007). The importance of participant interaction in online environments. Decision support systems, 43(3): 853-865.

Astin, A.W. (1993). What matters in college? Four critical years revisited. San Francisco: Jossey-Bass.

Banerjee, M. & Brinckerhoff, L. C. (2002). Assessing student performance in distance education courses: Implications for testing accommodations for students with learning disabilities. Assessment for Effective Intervention, 27(3), 25-35.

Beaudoin, M. (1990). The instructor's changing role in distance education. The American journal of distance education, 4(2), 26–34.

Benbunan-Fich, R., Hiltz, S. R., & Harasim, L. (2005). The online international learning model: An integrated theoretical framework for learning networks. In S. R. Hiltz, R.G. Goldman (Eds.), Learning together online, 20-37. Mahwah, New Jersey:

Betts, K.S. (1998). An institutional overview: Factors influencing faculty participation in distance education in postsecondary education in the United States: An institutional study. Online journal of distance learning administration, *1*(3). Retrieved January 1, 2009, from http://www.westga.edu/~distance/Betts13.html

Biggs, J. B. (1999). Teaching for quality learning at university. Buckingham: The society for research into higher education & Open University press.

Bolliger, Doris U. (2004). Key factors for determining student satisfaction in online courses. *International Journal on E-learning* 3.1: 61-67.

Bower, B.L. (2001). Distance education: Facing the faculty challenge. *Online Journal of distance learning administration*, *4*(2). Retrieved January 1, 2009, from http://www.westga.edu/distance/ojdla/summer42/bower42.html

Boyd, D.M., & Ellison, N.B. (2007). Social network sites: Definition, history, and scholarship. journal of computer-mediated communication, *13*(1). Retrieved from http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html.

Chen, Chih-Ming, Hahn-Ming Lee, and Ya-Hui Chen (2005). Personalized e-learning system using item response theory. *Computers & Education*, 44.3, 237-255.

Chiu, C., Hsu, M., & Sun, S. (2005). Usability, quality, value and e-learning continuance decisions. *Computers & Education*, 45, 399-416.