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Developing Transactional Distance Scale and Examining Transactional Distance Perception of Blended Learning Students in Terms of Different Variables

Mehmet Barış HORZUM[a]
Sakarya University

Abstract

The first purpose of this study was to develop valid and reliable a scale which measure the transactional distance. Besides, the second purpose of the study was to investigate whether the transactional distance perception differed according to gender, utilized component and number of logins to system, and also blended learning was useful. The study group consisted of 197 blended learning students at the Faculty of Economics and Administrative Sciences in Sakarya University. The scale consisted of 38 items and 5 sub-factors. It was found out that gender, utilized component and number of logins to system did not have a significant effect on transactional distance perception. Dialog, structure flexibility, control, and autonomy perception of participants who regarded blended learning useful was high; on the other hand, their content organization perception was low.

Key Words

Transactional Distance, Blended Learning, Transactional Distance Scale.

From past to present, dropout rate of students is one of the main problems regarding to distance education. Related research showed that approximately 30% and 50% of distance education students fail to complete distance education courses (Moore & Kearsley, 1996; Wheeler & Reid, 2005). This high level dropout rate encouraged the researchers to study on this topic. In these studies, difficulty of lesson, attitude, motivation, determination, success and satisfaction are found to be major variables related to students' drop out (Huang, 2002; Kearsley & Lynch, 1996; Moore, 2001; Offir, Lev, Lev, Barth, & Shteinbek, 2004; Stein & Wanstreet, 2003; Swain, 2002). Specific theories of distance education come into prominence to find solutions to dropping out problem and other related problems.

Transactional Distance (TD) is "a psychological and communication space of potential misunderstanding between the inputs of instructor and those of the learner; it is not only a physical space" (Moore & Kearsley, 1996). According to TD theory, distance education elements are related with two variables; distance (structure and dialog) and autonomy (Verduin & Clark, 1994). Transactional distance is consisted of dialogue component which refers two way interactions between learner and teacher and structure component which refers to the extent to which an education program can accommodate or be responsive to each learner's individual needs. Autonomy refers to active participation of students in determining learning activities and evaluation criteria. Moore (1972; 1980; 1993) considered the dialogue and structure as significant variables in distance learning and suggested them

a PhD. Mehmet Barış HORZUM is currently an Assistant Professor at the Computer and Instructional Technology Department. His research interests include distance education, transactional distance and learning object. *Correspondence:* Assist. Prof. Mehmet Barış HORZUM, Sakarya University, Faculty of Education, Computer and Instructional Technology Department, Sakarya/Turkey. E-mail: horzum@gmail.com. Phone: +90 264 6141033/613.

as dimensions of TD. In a distance education program while dialogue increases structure decreases, on the contrary while structure increases dialogue decreases (Gunawardena & McIsaac, 2004).

Based on Moore's theory and using with system dynamics models, Saba and Shearer (1994) defined two more variables, namely learner control and teacher control. Dron (2006) defined this control variable as transactional control. Dron's transactional control variable is related with choices. In all of the modes of distance education, online, offline or face to face, some of the choices are made by teachers and some of the choices are made by students. The way of how and who make these choices includes transactional control. Transactional control has a constant structure and similar to the TD theory, as teacher control increases student control decreases (Dron, 2007).

Consequently, TD theory comprised of four variables, namely, structure, dialogue, autonomy and control. Literature related with TD theory points out the three main categories. The first one aimed to elaborate, to criticize, to test hypotheses of TD theory and also attempts to develop tools and methods to reduce transactional distance (Bischoff, 1993; Bischoff, Bisconer, Kooker, & Woods, 1996; Braxton, 2000; Cookson & Chang, 1995; Force, 2004; Gorsky & Caspi, 2005a; Jung, 2000b; Kanuka, Collet, & Caswell, 2002; Lenear, 2006; Lowe, 2000; Lowell, 2004; Saba & Shearer, 1994; Sandoe, 2005). The studies in the second category aimed to investigate relation of individual differences and various variables with the level of DU which was caused by TD on the structure and dialogue variables (Brenner, 1996; Chen, 1997; Chen & Willits, 1998; Garrison, 1990; Gorsky & Caspi, 2005b; Hopper, 2000; Horzum, 2007; Jung, 2000a; Jung, Seonghee, Lim, & Leem, 2002; Pruitt, 2005; Stein, Wanstreet, Calvin, Overtoom, & Wheaton, 2005; Wilkes & Burnham, 1991). Among these studies, except of Cookson and Chang (1995), Garrison (2000); Gorsky and Caspi (2005a), all of them support TD theory in different contexts. The studies in the third category have attempted to expand extend of TD theory and to relate it with new concepts. In their studies Shin (2001), Shin and Chan (2004) revealed out the relation of TD with transactional presence; Saba and Shearer (1994), Garrison (2000), Dron (2006, 2007) revealed out relation with transactional control; Lowell (2004) showed the relation of social presence, Lemone (2005) with cultural factors and Jung (2006) revealed out the relation with immediacy.

Examining literature showed that however transactional distance perception has been generally measured by scale, there are limited numbers of study that measure transactional distance with qualitative methods (Bennett, 2007; Stein, Wanstreet, & Calvin, 2009; Vealé, 2009). Among these studies which used scales to investigate transactional distance perception, Bischoff (1993) and Bischoff et al. (1996) used interactive television, Chen (1997) and Chen and Willits (1998) used video conference, Chen (2001b), Huang (2000; 2002), Zhang (2003), Sandoe (2005), Burgess (2006) and Pettazoni (2008) used internet environment.

According to Horton (2006), blended learning refers to integration of various training model in accordance with an objective. This model generally combines e-learning with face to face learning activities and teaching techniques. The word "blended" means traditional instructor-led training is being supplemented with other electronic formats (Bersin, 2004). Blended learning implementations have become widespread implementations (Allen & Seaman, 2006). In blended learning literature, Dron, Seidel, and Litten (2004), Wheeler (2007), Benson and Samarawickrema (2009) studied about TD related with blended learning.

Examining related literature showed that, there is a lack of scale to measure transactional distance perception in blended learning environments and also there are limited numbers of study about transactional distance in blended learning environments, and studies that examine factors as gender, age, utilized component, technology skill and experience (Chen, 1997, 2001b; Chen & Willits, 1998; Huang, 2000, 2002; Jung, 2000b) which could affect transactional distance perception in blended learning environments. From this point, the purpose of this study is to investigate whether the transactional distance perception of 197 blended learning students from Faculty of Economics and Administrative Sciences in Sakarya University, differs according to gender, finding blended learning useful or not, utilized component and number of logins to system.

Method

Research Design

This study was based on general survey design. The data were collected by cross sectional method. In cross sectional method, information is collected one point in time (Fraenkel & Wallen, 2006).

Study Group

The study group consisted of 197 blended learning students at the Faculty of Economics and Administrative Sciences in Sakarya University in 2009-2010 academic year. The data were collected with "Perceived Transactional Distance in Blended Learning Environments Scale" which was developed by researcher.

Instrument

The scale, developed for this study, was a Likert type scale which aimed to determine transactional distance perception of students in blended learning environments. Exploratory factor analysis results showed that the scale included 38 items and five factors. Eigen value of scale was found 22.47 and 59.11% of the total variance was explained. Confirmatory factor analysis was executed to confirm the scale structure. As a result of confirmatory factor analysis, fit indices were found as; χ^2=907.01 (sd= 653, p= .000), χ^2 / sd= 1.39, RMR= .07, SRMR= .05, RMSEA= .045, CFI= .98, NFI= .93 ve NNFI= .98. These results showed that fit indices were in acceptable fit (Anderson, & Gerbing, 1984; Byrne, 1998; Sümer, 2000) and explanatory factor analysis result values were well (Green & Salkind, 2005). The Cronbach alpha value of "Perceived Transactional Distance in Blended Learning Environments Scale" with 38 items was found to be .92. Cronbach alpha coefficient of sub factors was found as, .91 for dialogue, .91 for structure flexibility, .91 for content organization, .87 for control and .82 for autonomy.

Data Collection and Analysis

The data were collected administering written questionnaire. In this research t-test and Kruskal-Wallis H test were used for the analysis of the data. The data were analyzed by using SPSS 10.00 package program.

Result and Conclusion

In consequence, five-sub factors of scale were called as Dialogue, Autonomy, Structure Flexibility, Content Organization and Student Control. In line with this finding, in related literature, dialogue, autonomy, structure (structure flexibility and content organization) (Bischoff, 1993; Bischoff et al., 1996; Braxton, 2000; Chen, 1997; Chen & Willits, 1998; Gunawardena & McIsaac, 2004; Huang, 2002; Moore, 1972, 1980, 1993; Moore & Kearsley, 1996; Saba & Shearer, 1994) and control (Dron, 2006, 2007; Saba & Shearer 1994) were also found to be as variables of TD theory and components of this theory. So it can be suggested that, this scale is consistent with related literature and includes similar variables with literature.

Since it is important, factors of scale should confirm assumptions of theory in blended learning environments, relationship between factors was also examined. Among factors, positive high level significant correlation was found between dialogue and structure flexibility. Furthermore, negative high level significant correlation was found between dialogue and content organization, and between structure flexibility and content organization. As a result, negative relation was found between structure (organization of content and being not flexible) and dialogue. This finding is in line with assumptions of theory (Moore, 1993; Moore & Kearsley, 1996; Saba & Shearer, 1994) which suggests that as dialogue increases structure decreases; as dialogue decreases structure increases. In addition, this finding is similar to the other related research which used other communication technologies Bischoff (1993), Bischoff et al. (1996), Bunker, Gayol, Nti, and Reidell (1996), Huang (2002), Force (2004), Dron et al. (2004), Lemak, Montgomery, and Reed (2003), Kanuka (2001).

Correlation between autonomy and other factors was found to be low. This finding is in contrast with the assumption of Moore's (1972) autonomy theory. Further this finding is also in contrast with studies of Huang (2002), Kearsley and Lynch (1996) and Wagner (1993). By taking into consideration this finding, it can be suggested that autonomy is not an effective variable in blended learning environments.

The results were presented respectively by four independent variables (gender, to find blended learning useful or not, the most utilized system components and the number of daily connections to the internet). According to these variables whether if there were differences in the scale of the five subfactors were analyzed. The gender of students' participating in the research dialog, flexibility of structure, content organization, control and perception of self-determination were not statistically different in blended learning environment. The results in transactional distance had no significant effect on gender, which was revealed in the learning environments.

According to the most utilized system components, dialog, flexibility of structure, content organizati-

on, control and perception of self-determination did not show statistically significant differences among students in blended learning. These results showed that the most utilized system component was not a significant variable in students' perception of distance learning in learning environment.

The students participating in the research were found that their daily number of connecting to learning management system, dialog, flexibility of structure, content organization, control and perception of self-determination did not show statistically significant differences among students in blended learning environment. This results showed that students' perception of transactional distance connection to the daily number of learning management system was not a significant variable in learning environment.

As a result of this study, it was found out that gender, utilized component and number of login to system did not have a significant effect on transactional distance perception. This finding is in line with findings of Chen (2001a), Hopper (2000), Huang (2000; 2002), Lenear (2006) and Rabinovich (2009). Dialog perception, structure flexibility perception, control perception, and autonomy perception of participants who found blended learning useful was high; on the other hand, their content organization perception was found to be low. Lim, Morris, and Yoon (2006) explained the reason of this finding as motivation.

This study failed to support assumptions of autonomy theory. So in further research, qualitative studies could be designed to elaborate this finding. This study has found that finding blended learning useful decreases distance perception toward blended learning. It can be concluded that student should be trained in blended learning environment by raising awareness.

In this study a scale was developed to measure the transactional distance in learning environment. The scale can be used for the relationship between variables like social presence, satisfaction, achievement and perception of distance for the following researches. The dimension of the self-determination was found that it did not give the same results such as the theory's assumption. In the direct of this result students may be advised to put in the practice to raise awareness of blended learning environment. Control is a dimension of the research.

On that sense, it is thought to be retracing the problem with the next qualitative researches about self-determination. In this research it's found that student's thoughts about blended learning are useful, which decreases the perception of distance learning for blended learning.

The next survey of the theories proposed development work to be done and developed in terms of scale, control variables can be examined. To develop as a control variable for the scale of the theory can be done and the control can be examined in terms of various variables with the developed scale in the next researches.

References/Kaynakça

Allen, I. E., & Seaman, J. (2006). *Making the grade online education in the United States, 2006. The Sloan Consortium (SLOAN-C)*. Retrieved 27 March, 2007 from www.sloan-c.org.

Anderson, J. C., & Gerbing, D. W. (1984).The effect of sampling error on convergece, improper solutions and goodness-of-fit indices for maximum likelihood confirmatory factor analysis. *Psychometrika, 49*, 155-173.

Bennett, L. J. (2007). *Measuring transactional distance* (Degree of Bachelor of Science). USA: Worcester Polytechnic Institute.

Benson, R., & Samarawickrema, G. (2009). Addressing the context of e-learning: Using transactional distance theory to inform design. *Distance Education*, *30* (1), 5-21.

Bersin, J. (2004). *The blended learning book: Best practices, proven methodologies, and lessons learned*. San Francisco: John Wiley and Sons, Inc.

Bischoff, W. R. (1993). *Transactional distance, interactive television, and electronic mail communication in graduate public health and nursing courses: Implications for professional education*. Unpublished doctoral dissertation, The University of Hawaii.

Bischoff, W. R., Bisconer, S. W., Kooker, B. M., & Woods, L. C. (1996). Transactional distance and interactive television in the distance education of health professionals. *The American Journal of Distance Education*, *10* (3), 4-19.

Braxton, S. N. (2000). *Empirical comparison of technical and non-technical distance education courses to derive a refined transactional distance theory as the framework for a utilization-focused evaluation tool*. Unpublished doctoral dissertation, George Washington University.

Brenner, R.J. (1996). *An analysis of the transactional distance in asynchronous telecourses at a community college using the group embedded figures test*. Unpublished doctoral dissertation, East Tennessee University.

Bunker, E., Gayol, Y., Nti, N., & Reidell, P. (1996). A study of transactional distance in an international audio conferencing course. In *Proceedings of seventh international conference of the society of information technology and teacher education* (pp. 40-44). Arizona: Phoenix.

Burgess, J. V. (2006). *Transactional distance theory and student satisfaction with web-based distance learning courses*. Unpublished doctoral dissertation. Florida: The University of West Florida.

Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS and SIMPLIS: Basic concepts, applications, and programmings*. London: Lawrence Erlbaum Assocatiates, Publishers.

Chen, Y. J. (1997). *The implications of Moore's Theory of transactional distance in a videoconferencing learning environment*. Unpublished master' thesis, The Pennsylvania State University.

Chen, Y. J. (2001a). Transactional distance in World Wide Web learning environment. *Innovations in education and teaching international journal* (IETI), *38* (4), 327-338.

Chen, Y. J. (2001b). Dimension of transactional distance in the World Wide Web learning environment: A factor analysis. *British Journal of Educational Technology, 32* (4), 459-470.

Chen, Y. J., & Willits, F. K. (1998) Dimensions of educational transactions in a videoconferencing learning environment. *American Journal of Distance Education*, *13* (1), 1-21.

Cookson, P. S., & Chang, Y. (1995). The Multidimensional Audio conferencing Classification System (MACS). *The American Journal of Distance Education*, 9 (1), 18-36.

Dron, J. (2006). The teacher, the learner and the collective mind. *AI & Society, 21* (1-2), 200-216.

Dron, J. (2007). Designing the undesignable: Social software and control. *Educational Technology & Society*, *10* (3), 60-71.

Dron, J., Seidel, C., & Litten, G. (2004). Transactional distance in a blended learning environment. *ALT-J, Research in Learning Technology, 12* (2), 163-174.

Force, D. (2004). *Relationships among transactional distance variables in asynchronous computer conferences: A correlational study.* Unpublished doctoral dissertation, Athabasca University, Athabasca, Alberta.

Fraenkel, J. R., & Wallen, N. E. (2006). *How to design and evaluate research in education* (6th ed.). New York: Mac Graw Hill, Inc.

Garrison, D. (1990). An analysis and evaluation of audio teleconferencing to facilitate education at a distance. *The American Journal of Distance Education*, *4* (3), 13-24.

Garrison, R. (2000). Theoretical Challenges for Distance Education in the 21st Century: A Shift from Structural to Transactional Issues. *International Review of Research in Open and Distance Learning, 1* (1), 1-17.

Gorsky, P., & Caspi, A. (2005a). A critical analysis of transactional distance theory. *Quarterly review of distance education*, *6* (1), 1-11.

Gorsky, P., & Caspi, A. (2005b). Dialogue: a theoretical framework for distance education instructional systems. *British Journal of Educational Technology*, *36* (2), 137-144.

Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (4th ed.). Upper Saddle River, NJ: Pearson.

Gunawardena, C. N., & McIsaac, M. S. (2004). Distance education. In D. H. Jonassen (Ed.), *Handbook of research on educational communications and technology* (2nd ed., pp. 355-395). New Jersey: Lawrence Erlbaum Associates, Publishers.

Hopper, D. A. (2000). *Learner characteristics, life circumstances, and transactional distance in a distance education setting.* Unpublished doctoral dissertation, Wayne State University, Detroit, Michigan.

Horton, W. (2006). *E-Learning by design*. San Francisco: Pfeiffer, John Wiley & Sons, Inc.

Horzum, M. B. (2007). *İnternet tabanlı eğitimde etkileşimsel uzaklığın öğrenci başarısı, doyumu ve öz-yeterlik algısına etkisi*. Yayımlanmamış doktora tezi, Ankara Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Huang, H. M. (2000). *Moore's theory of transactional distance in an online mediated environment: Student perceptions on the online courses.* Unpublished doctoral dissertation, Seattle Pacific University, Washington.

Huang, H. M. (2002). Student perceptions in an online mediated environment. *International Journal of Instructional Media*, *29* (4), 405-422.

Jung, H. Y. (2006). *Transactional distance and student motivation: Student perception of teacher immediacy, solidarity toward peer students and student motivation in distance education.* Unpublished doctoral dissertation. West Virginia University, West Virginia.

Jung, I. (2000a, June). Enhancing teaching and learning through research: Focusing on web-based distance education. Paper presented at the *CRIDALA 2000 – Enhancing learning and teaching through research 1. The Open University of Hong Kong*.

Jung, I. (2000b). *Internet-Based distance education bibliography (1997-1999)*. Retrieved 27 July, 2006 from http://www.ed.psu.edu/acsde/annbib/annbib.asp.

Jung, I., Seonghee, C., Lim, C., & Leem, J. (2002). Effect of different type of interaction on learning achievement, satisfaction and participation in Web Based Instruction. *Innovation in Education and Teaching International*, *39* (2), 153-162.

Kanuka, H. (2001). University student perceptions of the use of web in distance-delivered programs. *Canadian Journal of Higher Education*, *31* (3), 49-72.

Kanuka, H., Collett, D., & Caswell, C. (2002). University instructor perceptions of the use of asynchronous text-based discussion in distance courses. *The American Journal of Distance Education*, *16* (3), 151-167.

Kearsley, G., & Lynch, W. (1996). Structural issues in distance education. *Journal of Education for Business, 71* (4), 191-195.

Lemak, D. J., Montgomery, J. C., & Reed, R. (2003). Instructor effectiveness in distance education: The case of technology and transactional distance. In *Proceedings of the 2003 Academy of Management Conference.* Seattle, Washington.

Lemone, K. (2005). Analyzing cultural influences on elearning transactional issues. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2005* (pp. 2637-2644). Chesapeake, VA: AACE.

Lenear, P. E. (2006). *The effective of internet based mentoring program on the transactional distance and interaction between mentors and protégés.* Unpublished doctoral dissertation, University of Illinois, USA.

Lim, D. H., Morris, M. L., & Yoon, S. (2006). Combined effect of instructional and learner variables on course outcomes within an online learning environment. *Journal of Interactive Online Learning*, *5* (3), 255-269.

Lowe, W. (2000). Transactional distance theory as a foundation for developing innovative and reactive instruction. *Educational Technology & Society, 3* (1), 1-3.

Lowell, N. O. (2004). *An investigation of factors contributing to perceived transactional distance in an online setting. Unpublished doctoral dissertation*, University of Northern Colorado, Greeley, CO.

Moore, M. G. (1972). Learner autonomy: The second dimension of independent learning. *Convergence,* 5 (2), 76-97. Retrieved 18 February, 2005 from http://www.ajde.com/Documents/learner_autonomy.pdf.

Moore, M. G. (1980). Independent study. In R. Boyd, & J. Apps (Eds.), *Redefining the Discipline of Adult Education* (pp. 16-31). San Francisco: Jossey-Bass.

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principle of distance education* (pp. 22-38). London: Routledge.

Moore, M. G. (2001, June). *Distance education in the United States: The state of the art*. Paper predented at the Series of lectures on the educational use of ICT and virtual education. Retrieved 18 February, 2005 from http://www.uoc.edu/web/eng/art/uoc/moore/moore.html.

Moore, M. G., & Kearsley, I. G. (1996). *Distance education: A systems view*. Boston, MA: Wadsworth Publishing Company.

Offir, B., Lev, Y., Lev, Y., Barth, I., & Shteinbek, A. (2004). An integrated analysis of verbal and nonverbal interaction in conventional and distance learning environment. *Journal of Educational Computing Research*, *31* (2), 101-118.

Pettazzoni, J. E. (2008). *Factors associated with attitudes toward learning in an online environment: Transactional distance, technical efficacy, and physical surroundings.* Unpublished doctoral dissertation, Mississippi: The University of Southern Mississippi.

Pruitt, D. (2005). *Transactional distance and learner autonomy as predictors of student performance in distance learning courses delivered by three modalities*. Unpublished doctoral dissertation, Tulane University, USA.

Rabinovich, T. (2009). *Transactional distance in a synchronous Web-extended classroom learning environment.* Unpublished doctoral dissertation, Boston University, Massachusetts, USA.

Saba, F., & Shearer, R. L. (1994) Verifying the key theoretical concepts in a dynamic model of distance education. *The American Journal of Distance Education, 8* (1), 36-59.

Sandoe, C. (2005). *Measuring transactional distance in online courses: The structure component*. Unpublished doctoral dissertation, University of South Florida.

Shin, N. (2001). *Beyond interaction: Transactional presence and distance learning.* Unpublished doctoral dissertation, Pennsylvania State University, University Park, PA.

Shin, N., & Chan, J. K. Y. (2004). Direct and indirect effects of online learning on distance education. *British Journal of Educational Technology, 35,* 275-288.

Stein, D. S., Wanstreet, C. E., & Calvin, J. (2009). How a novice adult online learner experiences transactional distance. *Quarterly Review of Distance Education*, *10* (3), 305-311.

Stein, D. S., & Wanstreet, C. E. (2003, October). *Role of social presence, choice of online or face-to-face group format, and satisfaction with perceived knowledge gained in a distance learning environment*. Paper presented at the Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, The Ohio State University, Columbus.

Stein, D. S., Wanstreet, C. E., Calvin, J., Overtoom, C., & Wheaton, J. E. (2005). Bridging the transactional distance gap in online learning environments. *The American Journal of Distance Education*, *19* (2), 105-118.

Swain, C. (2002). Improving traditional teaching using findings from distance education. *Effective Teaching* [Online series], *5* (2). Retrieved 12 November 2006 from http://cte.uncwil.edu/et/articles/Swain/.

Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları*, *3* (6), 49-74.

Vealé, B. L. (2009). *Transactional distance and course structure: A qualitative study.* Unpublished doctoral dissertation, The University of Nebraska – Lincoln, Nebraska.

Verduin, J., R. ve Clark, T. A. (1994). *Uzaktan eğitim: etkin uygulama esasları* (çev. İ. Maviş). Eskişehir: Anadolu Üniversitesi Basımevi.

Wagner, E. D. (1993). Variables affecting distance educational program success. *Educational Technology*, *33* (4), 28-32.

Wheeler, S. (2007). The influence of communication technologies and approaches to study on transactional distance in blended learning. *ALT-J: Research in Learning Technology*, *15* (2), 103-117.

Wheeler, S., & Reid, F. (2005, June) *A Matter of perception? Transactional distance and student support in distance education*. Paper presented at the European Distance and E-Learning Network (EDEN) 2005 Conference, Helsinki, Finland. Retrieved November 12, 2010 from http://www2.plymouth.ac.uk/distancelearning/EDEN05.html.

Wilkes, C. W., & Burnham, B. R. (1991). Adult learner motivations and electronic distance education. *The American Journal Of Distance Education, 5* (1), 43-50.

Zhang, A. (2003). *Transactional distance in Web-based college learning environments: Toward measurement and theory construction*. Unpublished doctoral dissertation, Virginia Commonwealth University, Virginia.