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

Mehmet Barış HORZUM
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 & Wanstrett, 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...
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; Lenebar, 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.
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; \( \chi^2=907.01 \) (sd= 653, \( p = .000 \), \( \chi^2 / sd= 1.39 \), RMR= .07, SRMR= .05, RMSEA= .045, CFI= .98, NFI= .98 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 sub-factors 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


