Transactional Distance as a Predictor of Perceived Learner Satisfaction in Distance Learning Courses: A Case Study of Bachelor of Education Arts Program, University of Nairobi, Kenya

Joyce Kanini Mbwesa

Correspondence: Joyce Kanini Mbwesa, School of Continuing and Distance Education, Department of Educational Studies, University of Nairobi, Kenya

Abstract

There is a long history of study and recognition of the critical role of interaction in supporting and even defining distance education. Interaction has been identified as key to the success of distance learning. It is key in fostering, supporting and engaging in the learning process. Moore (1989) posits that the physical distance that exists in e-learning courses between the teacher and the students may result in a psychological and communicational gap between them. Such a gap will often impede the ability of the teacher and his or her students to achieve the desired level of understanding among them. In the light of this, teachers and students participating in distance-learning courses will generally require "special" behavioral patterns, which are designed to overcome the communication gaps resulting from the transactional distance. This study examined three key distances experienced by students enrolled in distance learning courses as predictors of perceived learner satisfaction. Through a survey analysis, the study sought to answer 3 key questions - to what extent is Leaner-Leaner Transactional Distance (LLTD) predictive of students' perceived satisfaction (SPS) with a Distance Education (DE) course? Is Learner-Teacher Transactional Distance (LTTD) a predictor of students perceived satisfaction with the DE course? To what extent does Learner-Content Transactional Distance (LCTD) serve as a predictor of perceived learner satisfaction with a DE course? Subjects constituted of a random sample of 168 students enrolled for a Bachelor of education program in 2013 at the University of Nairobi, Kenya. A survey questionnaire measured the predictive constructs of the study namely, Learner-Learner Transactional Distance (LLTD), Learner-Teacher Transactional Distance (LTTD) and Learner-Content Transactional Distance (LCTD). Students' perceived satisfaction (SPS) was measured by use of a ten item Likert scale instrument. Results of the study indicated the three variables were key predictors of students' perceived satisfaction with DE courses.

Keywords: Transactional distance, Distance Education, Learner satisfaction, Learner-Teacher transactional distance, Learner-Learner Transactional distance, Learner-Content Transactional distance

1. Introduction and Problem Statement

The past few decades have witnessed the evolution of distance education (DE) into a complex and dynamic instructional approach that is feeding discussions that range from the quality of learning supported by this approach, the efficacy of the approach to what influences how learning happens in this entity. In the historical progression of distance education from correspondence courses to online learning, distance education is now seen as having a great potential of connecting students to instructors and other students, and as a way to provide innovative opportunities for students to learn (Chen, Y. (2001a, Moore, M., G. (2007) Starr-Glass, D. (2011). However, this has not been without numerous challenges and concerns that have lately fed the discussion on the quality of distance education.

One of the key discussions that has attracted interest and research in Distance education (DE) is the construct of distance experienced by distance learners in the learning process (Chen, Y. 2001b, Moore 2007). The idea of distance in Distance learning was first introduced by Moore in 1989 through his famous theory that he referred to as the transactional theory. Moore postulated that distance was a pedagogical phenomenon, rather than a function of geographic separation, which existed in face-to-face classes as well as in distance classes. Transactional distance (TD) was conceived as a function of dialogue, structure, and learner autonomy. The idea of learner autonomy was first introduced by Rogers (1969) and later on expanded by Moore in 2007. According to Moore, learners of varying degrees of ability can construct personal learning plans, find needed resources, and evaluate their own learning progress.

Autonomous learners can deal with lower levels of dialogue and structure along with high transactional distance (Moore, 2007). According to Moore (1989), if a DE course is structured to give directions and guidance to the students but offers no opportunities for dialogue, then this increases the transactional distance resulting to less effectiveness in learning. Courses that are highly structured offer little or no opportunity for deviation or variation and are less sensitive to the needs and characteristics of the learners. This implies that the higher the level of structure in a course, the higher the transactional distance, and thus the lower the level of student satisfaction. Courses that have little transactional distance, where there is much dialogue and structure, seem better suited to less autonomous learners.

Distance according to Moores' theory is pedagogical and not geographical. It is a distance of understandings and perceptions that might lead to a communication gap or a psychological space of potential misunderstandings between people more so between the student and teacher in the learning environment. This distance accordingly needs to be overcome if effective, deliberate, planned learning is to occur. Whereas lately there has been several studies directed to studying this phenomenological distance in web and other forms of online learning, (Chen, 2001a, Moore, 2007, Starr-Glass, 2011), distance experienced by students still using print as the media of communication has not been systematically analyzed. Yet in many institutions of higher learning particularly in Africa, and Kenya in particular are still in the transitional stage of using print as the main media of interface as they try to adopt new technologies to drive distance education. The University of Nairobi for example offers many educational programs by use of Distance education methodologies. Print has been the main media that has largely been utilized. This involves sending out study modules to the learners who are spread over wide geographical areas. Occasional residential sessions that involve face to face teaching and interactions with the learners are also organized. These face to face interactions are limited to about two weeks in which learners have opportunities for face to face tutorials, practical assignments, examination among other key activities. The slow transition of the use of print as the primary media to ICTs is attributed to many factors ranging from infrastructural limitations to students and faculty competencies. Because of the nature of delivery mode used, learners here experience different dimensions of transactional distances that are inherent in the pedagogical method of delivery itself. For instance, most learners are spread over wide geographical areas so majority experience geographical or physical distance from the campus. The pedagogical distances relate to separation from their teachers for long periods of time, limited resources as well as distances amongst the learners themselves.

Where as many studies have dwelt on the construct of interaction in virtual environments (Miyazoe, Anderson, 2010, Miyazoe, 2009, Solimeno, Mebane, Tomai Francescato, 2008, Anderson, 2003b), only few studies (Moore 1972, Holmberg 1983) have looked at transactional distances particularly in print based DE course. Despite the sudden proliferation of Virtual learning, Print media is still a key DE delivery mode more so in developing countries and marginalized communities in rural settings such as the nomads where ICT developments are still embryonic. This context was therefore the situate of the analysis. The object of the present analysis was the identified three dimensions of transactional distances – leaner – content, teacher - learner and learner – content transactional distances as predictors of learner satisfaction with a DE course. Leaner satisfaction has before been used as a measure of success in DE courses (Frey, Alman, Barron, & Steffens, 2004, Mason, & Weller, 2000).

This study therefore explored further Moores' transactional theory and in particular identified three key pedagogical distances experienced by DE learners as predictors of Students' Perceived Satisfaction (SPS) with a print-based Distance education course. Whereas student satisfaction with distance learning is impacted by a variety of factors, this analysis was limited to learner – learner, learner-teacher and learner –content distance as predictive of students perceived satisfaction with the course.

2. Literature Review

Under this section, literature related to the constructs analyzed in this study is reviewed. Many studies have attempted to explore the construct of transactional distance as it relates to distance education. Many of these studies have focused on web based distance education. Kostina (2011) explored the relationship between autonomy, student-instructor dialogue, and student satisfaction within a web-based Russian language distance course. Forty six (46) students from two US higher education institutions participated in this study. Findings revealed that autonomy, dialogue, and satisfaction have significant correlation at the beginning and the middle point of the course. All three variables grew throughout the course, although the relationships among them significantly decreased towards the end of the course.

Chen (2000) examined Moore's theory (1989) and identified the dimensions (factors) constituting transactional distance in distance learning environments. In his conclusion, Chen notes that the concept of transactional distance represented multifaceted idea and consisted of four dimensions—instructor-learner, learner-learner, learner-content, and learner-interface transactional distance. Chen also supported Moore's perspective that distance is a psychological rather than geographic phenomenon and asserted that to fully understand transactional distance, additional items that lie within the factors must be identified. In fact Moore's theory of 'transactional distance' is based on the premises that all

educational settings, even face-to-face, contains some degree of distance. What determines the distance is the amount of interaction that takes place between learners and teachers and their environment. Thus according to Moore, distance is not a geographical but an interactional issue.

The construct of learner - content interaction has been explored by many. Zimmermann (2012) examined the relationship between learner-content interaction and course grade to determine if this interaction type is a contributing success factor. Data related to student interaction with course content, including time spent reviewing online course materials, such as module PowerPoint presentations and course videos and time spent completing weekly quizzes, were collected for students in three sections of an online course ($\mathbf{N}$ = 139). The data were then correlated against grades achieved in the course to determine if there was any relationship. Findings indicated statistically significant relationships between the amount of time the learner spent with the content and weekly quiz grades ($\mathbf{r}$ = .-72). The study concludes that learners who spent more time interacting with course content achieve higher grades than those who spent less time with the content.

Learner-content interaction results from students examining/studying the course content (Moore & Kearsley, 1996) and from participating in class activities. Chen (2001a) explored transactional distance in a Web-based learning environment using factor analysis. Chen (2001a) explains *Learner-content transactional distance*, as "the distance of understandings that learners perceive as they study the course materials and the degree that the materials meet their learning needs and expectations to the course" (p. 462). David Starr-Glass (2012), in his paper Learner Perceptions of Distance in an Online Course: Revisiting Moore's Theory of Transactional Distance considered the evolution of Moore's original work with a particular focus on its four dimensions of distance: learner- content, learner-learner, learner-instructor, and learning-interface. Starr – Glass study fed further the discussion of learner – content interaction and brought in a new dimension suggesting that there is usually a change in participant perception of transactional distance: initially low, but significantly lowered during the course. He attributed the decrease in participant perception to complex learner strategies, understood by Moore as learner autonomy.

Learner-Teacher transactional distance has attracted most research than all other forms of transactional distance interfaces. Chen 2001 explains *Learner-instructor transactional distance as the* "the psychological distance of understandings and communication that learners perceive as they interact with teacher. Moore (1989) notes that Learner-instructor interaction is the learner interacting with an expert of the subject matter to gain support, including motivation, self-direction, presentation of information, and evaluation. Although the influence of this type of interaction is considered to increase in accordance with its frequency and intensity, the instructor personalizes instruction by engaging in a mediated dialogue with each learner. Thurmond & Wambach, (2002) note that the interaction that transpires between students and faculty is intended to help reinforce student understanding of the material or elucidate meanings. Interacting with instructors can help students clarify nebulous points and reinforce correct interpretation of course information. Existing literature indicates that teachers' verbal (i.e., giving praise, soliciting viewpoints, humor, and self-disclosure) and nonverbal (i.e., physical proximity, touch, eye contact, facial expressions and gestures) immediacy behaviors can lessen the psycho-logical distance between them and their students, thereby leading to increased learning (Swan, 2001). The instructor is especially valuable in responding to the learner's application of new knowledge (Moore, 1989). When this interface of interaction is missing, then we talk of there being a learner instructor transactional distance (Chen 2001). The object of this analysis was the later - Learner-Teacher transactional distance as a predictor of students satisfaction of a print based DE course.

Learner-Learner transactional distance has also been considered in many studies (Chen 2001, Starr-Glass 2011, Alavi, 1994; Palloff & Pratt, 2001,). Chen 2001 explains Learner-learner transactional distance as the "the psychological distance that learners perceive while interacting with other learners" (p. 462). In this model, Moore clarifies that Learner-learner interaction can be between one student and another or between several students. Recent studies have shown that a basic element in traditional classroom learning is communication among the students: the ability to ask questions, to share ideas with others, or to disagree with others is a basic need in the learning process. Participants' interaction with one another within a learning community can allow them to overcome their isolation and strengthen their relationship with the group. Trentin, (1998) notes that in order for effective learning to occur, particularly in online courses, four types of peer behavior are necessary - participation, response, provision of affective feedback, and short, focused messaging. Team work, or collaborative learning, involves students working together in groups to complete academic assignments (Alavi, 1994; Palloff & Pratt, 2001). This form of learner-learner interaction is intended to promote understanding of the course content and stimulate critical thinking. Collaborative projects may lessen feelings of isolation and promote a sense of a learning community (Alavi 1994, Palloff & Pratt, 2001) in Distance education. The subsequent development of virtual classrooms, immersive environments, social networking sites and other web tools demonstrates the attraction and power of student-student interaction. The absence of this form of interaction therefore results in what Chen calls learner – learner transactional distance.

This study therefore examined pedagogical distances experienced by students enrolled in print based distance learning course as predictors of Students' perceived satisfaction with the DE course. The University of Nairobi Bachelor of Education arts program was used as the case of analysis.

2.1 Specific Objectives of the Study

The specific objectives of the present study were to:

1) Find out the extent to which Leaner-Leaner Transactional distance (LLTD) is predictive of students' perceived satisfaction (SPS) with the Distance learning course.

2) Establish the extent of Learner-Teacher Transactional distance (LTTD) and its influence on students' perceived satisfaction.

3) Examine the existing Learner - Content Transactional distance as a predictor of perceived learner satisfaction.

2.2 Research Questions

Through the analysis, the study sought to answer the following research questions:

1) To what extent is leaner-leaner Transactional distance predictive of students perceived satisfaction with the course?

2) Is learner-teacher Transactional distance a predictor of students perceived satisfaction with the course?

3) To what extent does learner-content Transactional distance serve as a predictor of perceived learner satisfaction with course?

2.3 Research Hypotheses

Based on these Research questions, the following null hypotheses were assumed:

1) Leaner-Leaner Transactional distance is not predictive of students' perceived satisfaction with the DE course.

2) Learner-Teacher Transactional distance is not a predictor of students' perceived satisfaction with the DE course.

3) Learner-Content Transactional distance does not serve as a predictor of perceived learner satisfaction with DE course.

2.4 Theoretical Framework

This analysis was largely informed by Moore's (1972) theorem, one of the first theorems to systematically define interaction in distance education. Moore (1972; 1973), in his groundbreaking transactional theory identified three elements critical in impacting transactional engagement : the structure of the environment, the degree of meaningful communication ("dialogue") that the structure permits, and the degree to which the learner is able to mediate choices and decisions regarding personal learning goals and trajectories ("learner autonomy"). According to Moore, 1997 *Structure refers to* the ways in which the teaching programme is structured so that it can be delivered through various communication media. 'Programmes are structured in different ways to take into account the need to produce, copy, deliver, and control these mediated messages. Structure expresses rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods. It describes the extent to which an education programme can accommodate or be responsive to each learner's individual needs" (p. 26).

Dialogue according to Moore is an interaction or series of interactions having positive qualities that other interactions might not have. To Moore, dialogue is purposeful, constructive and valued by each party. Each party in a dialogue is a respectful and active listener, each is a contributor, and builds on the contributions of the other party or parties. Subsequently he defines *Learner autonomy as*: "many students used teaching materials and teaching programs to the extent to which, the learner in the teaching/ learning relationship exercises control. In this context therefore, it is the learner rather than the teacher who determines the goals, the learning experiences, and the evaluation decisions of the learning programs"(p.27)

Moore (1972) also proposed three distinct types of interaction in distance education: learner-content, learner-instructor, and learner-learner interactions. He further hypothesized that when these elements are not present in a DE environment, then they contribute to the transactional distance. In other words, the transactional distance increases with the absence of these elements. And this was the focus of the present analysis. The study examined pedagogical distances experienced by students enrolled in print based distance learning courses as predictors of perceived students Satisfaction with the DE course. This is captured in the conceptual framework presented in fig one.
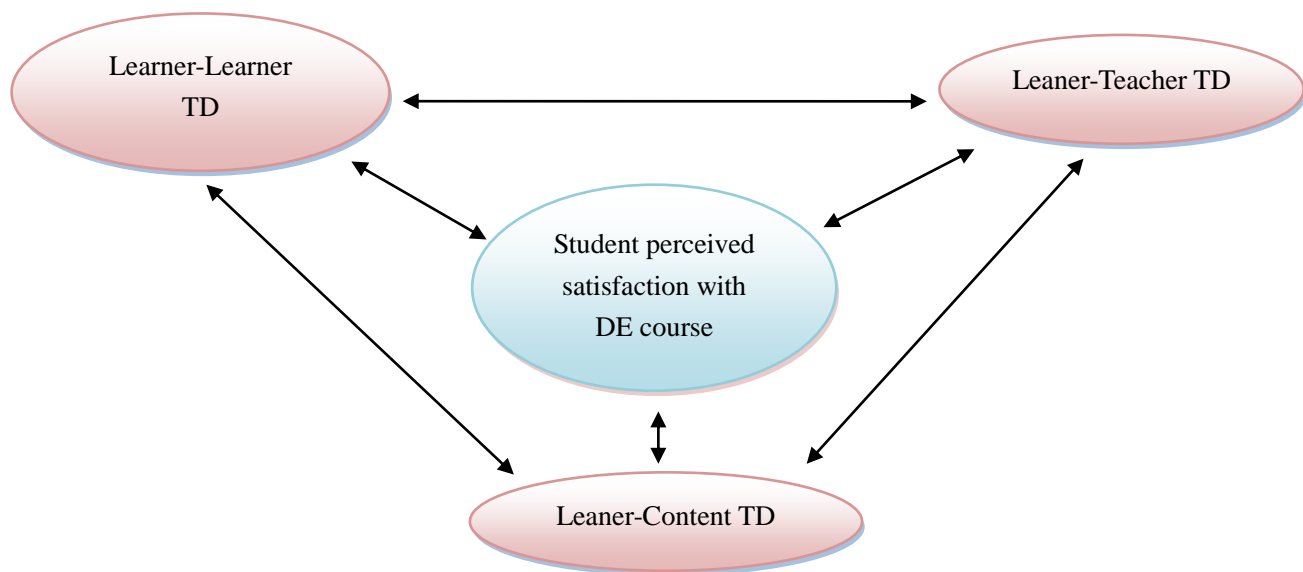
Figure 1. Conceptual Framework: Pedagogical Distances experienced by distance learners

3. Research Design and Methodology

Survey analysis was the main research design adopted in this study. Data was collected from a random sample of 168 Pursuing a Bachelor of education (arts) program of through distance learning at the university of Nairobi Kenya.

3.1 Instruments

A questionnaire, Learner Perceived Transactional Distance (LPTD) Constructed by the researcher was used as the key tool of data collection. The questionnaire was structured with two key sections. Section A sought information about personal students' characteristics or profile which was considered as key in this analysis. Section B of the questionnaire constituted of closed–ended Likert five point question items (ranging from 1 *(strongly disagree)* to 5 *(strongly agree).* *These* measured different dimensions of transactional distances experienced by learners and to which the students were required to indicate their extent of agreement. Each predictor variable (LLTD, LTTD and LCTD) was measured using 10 Likert Items. Students' perceived satisfaction (SPS) with DE course which constituted the response variable in this analysis was also measured by use of 10 Likert items.

3.2 Reliability Testing

Reliability testing for internal consistency of the Likert research items was performed through a calculation of Cronbach's Alpha coefficients, the values of which are shown in Table 1. All of the coefficients of the sub-scales were above 0.7 which are acceptable (Cortina 1993, Revelle, 1979, Nunnally, 1978) except LCTD with α =.672 which is still acceptable for behavioral studies (Revelle, 1979).

Table 1. Cronbach's Alpha Coefficient

Grouped Variables		Coefficient
Learner –learner Transactional Distance	LLTD	.829
Leaner –Teacher Transaction Distance	LTTD	.765
Learner-Content Transactional Distance	LCTD	.672
Students perceived satisfaction with DE course	SPS	.761

3.3 Data Analysis

Descriptive and correlational statistics were the main tools of analysis used. Grouping of categories to satisfy test prerequisite conditions were done. For example all Likert scale items measuring different dimensions of transactional distances experienced by learners were grouped to constitute specific component constructs renamed after the regrouping process. For example, the ten variables measuring Learner-Learner transactional distance experienced by students was regrouped into one single construct variable renamed learner-learner transactional distance (LLTD). The same was done to constitute the other key component variables i.e. Learner-Teacher transactional distance (LTTD) and Learner-Content Transactional Distance (LCTD). The use of combined groups of variables as representatives of the underlying "components" rather than using the individual variables themselves was found to be more useful and

meaningful. This process is based on the assumption that the underlying components cannot be measured directly but that they influence in an organized way the values of the variables that can be measured.

All the transactional distances were further measured using a Likert type of scale interval scale ranging from low (10-20 points) to High (41 – 50). And therefore in total, the maximum scores a respondent could attain in all 10 items measuring different dimensions of transactional Distance was 5x10 = 50 while the minimum score a respondent could obtain in all the items was 1x10 = 10. Subsequently, the following cumulative scoring system was used to classify the respondents as experiencing low or high transactional distance.

10 - 20 = Vey Low transactional distance (TD)

21- 30 = Low TD

31- 40 = High TD

41 – 50 = Very High TD

Spearman's rho correlation coefficients were calculated for all identified predictor Components of transactional distance i.e. LLTD, LTTD and LCTD paired with the response variable - Student perceived satisfaction with DE course (SPS). Spearman's rho coefficient was used instead of the Pearson coefficient because most variables were of ordinal nature. Contingency tables were created and regrouped when necessary, and the test calculations performed using SPSS.

4. Results

Under this section, results of the study are presented, interpreted and discussed.

4.1 Demographic Profile of the Respondents

A total of 168 students participated in the study. Demographic analysis of the data revealed that that there were more female (56%) in the program than male who constituted 43.5%. The respondents' age ranged between below 25 years 54 years with majority (88.1%) falling in the bracket of 25 – 44 years. It is interesting to note that a sizeable number of the students (11.9%) are quite mature students falling in the age bracket of 45 – 55 years. This is a group nearing retirement and the result indicates that the program is quite inclusive in the sense that it does serve the needs of the mature student who still wish to further their studies. The analysis also indicated that many (78.6%) of the students are actually married with majority (75.6%) having between 1-4 children. Only a few 21.4% indicated that they were single. Majority of the students (89.3%) also hold prior primary school teacher education training certificate (PI) and only very few (8.3%) are fresh students with high school certificate. This implies that the program serves largely practicing teachers who are pursuing a further education to upgrade their professional training.

Many of the students are also on full time employment (72.6%) and perhaps these could explain their choice of Distance education as the suitable learning approach. Distance education of course does provide the flexibility to the students which is not just available in conventional systems of education. In fact, almost all are practicing teachers (93.5%) with majority (55.3%) having a work experience of 6- 15 years. This implies that most of the students are in indeed in the middle life of their careers where they still have to build strong foundation for their career growth. Only a few (6.5%) of the students are in other career paths. It is also interesting to note that although many of the students (75.6%) serve as regular teachers, a few are in managerial positions such as school head teachers and departmental heads (13.7%). See table 2

Table 2. Demographic profile of the respondents

Item	Scale	Valid percentage
Gender	Male	43.5
	Female	56.5
Marital status	Married	78.6
	Single	21.4
Age	Below 25	10.7
	25-39	61.3
	40-54	28
Career	Teachers	93.5
	Administrators	6.5
Work experience	1-5 years	26.2
	6- 10 years	36.3
	11 – 15 years	19
	Over 15 years	18.5

4.2 Learner – Learner Transactional Distance

Before the computation of correlations of the component variable that assessed the influence of the predictor variables (LLTD, LTTD and LCTD) on the response variable (Student perceived satisfaction), descriptive statistics was used to explore the data for to the distribution of the responses on the Likert scale items. And although the data provided by these variables does not contribute directly to answering the key research questions, it was intended to explore the data for description purposes. Table 3 below summarizes the responses to the Likert scale items in terms of their frequency and mean distributions.

Table 3. LLTD Variable Frequencies, means and standard deviations

LLTD ITEMS	Measures					
	SD	D	A	SA	Mean	Std.
	F/P	F/P	F/P	F/P		Deviation
Overall, I do interact with fellow students	2(1.2)	3(1.8)	137(81.5)	26(15.5)	3.2679	.78514
I do get feedback from my classmates	4(2.4)	24(14.3)	129(76.8)	11(6.6)	2.9345	.69334
We do hold group discussions with classmates	12(7.1)	26(15.5)	110(65.5)	20(11.9)	2.9048	.89736
I do communicate with colleagues through emails	9(5.4)	21(12.5)	118(70.2)	20(11.9)	3.0060	.90572
I do share my thoughts with colleagues	4(2.4)	14(8.3)	119(70.8)	31(18.5)	3.2262	.91365
I do comment on other students thoughts and ideas	9(5.4)	17(10.1)	117(69.6)	25(24.9)	3.0774	.93500
Group activities give me chances to interact with my classmates	5(3)	11(6.5)	113(67.3)	39(23.2)	3.3155	.97354
I attend regional meetings to interact with colleagues	2(1.2)	-	125(74.4)	41(24.4)	3.4643	.90171
During residential sessions I hold discussions with my classmates	2(1.2)	5(3.0)	127(75.6)	34(20.2)	3.3512	.87644
During home study I do consult my classmates for support in my assignments	4(2.4)	25(14.9)	129(76.8)	10(6.0)	2.9226	.69210

From this analysis, it is clear that all variables (Items) measuring LLTD were scored highly. For example, Item 8 (I attend regional meetings to interact with colleagues) yielded the highest mean score (M= 3.4643, SD = .90171). This implies that majority of the students do value interaction with colleagues. However, most students did not seem to value group discussions with classmates (ME = 2.9048, STD .89736.)

From the exploration and analysis of the data, majority of the learners (58.3%) were classified as experiencing low leaner -learner transactional distance (LLTD) while 32.1% were rated as experiencing high LLTD. Very few students rated themselves as experiencing extremely high LLTD. Overall, Leaner- learner Transactional distance registered the highest mean score of 31.4702 with a standard deviation of 5.41336. This implies that learner-learner transactional Distance is generally low among the students and the lower the transactional distance the better because it implies that there is more likelihood of effectiveness of learning. Effective learning involves team work, collaborative learning, students working together in groups to complete academic assignments and so on (Palloff & Pratt, 2001). Learner-learner interaction promotes understanding of the course content and stimulates critical thinking. Learners interacting with one another within a learning community can allow them to overcome their isolation and strengthen their relationship with the group. If well managed, Leaner-Leaner interaction can lessen feelings of isolation and promote a sense of a learning community in Distance education.

4.3 Leaner–Teacher Transactional Distance

Leaner–Teacher Transactional distance gave a high ranking in this analysis with 98.2% of the students indicating that they experienced high to very high transactional distance with the teachers. See table 4. In fact all the items scored below the mean score >2.5. Items 7 and 8 (my teachers help me out with Extra learning resources and my teachers help me with personal emotional guidance) received the lowest rankings with a low mean score of 1.8452 and 1.9940 respectively. This High score implies that learner-teacher transactional Distance is high. Again the higher the transactional distance between students and teachers, the less the effectiveness of learning and the more likelihood of students dissatisfaction with the course. Thurmond, Wambach, (2002) note that the interaction that transpires between students and faculty is intended to help reinforce student understanding of the material or elucidate meanings. Interacting with instructors can help students clarify nebulous points and reinforce correct interpretation of course information. Existing literature indicates that teachers' verbal (i.e., giving praise, soliciting viewpoints, humour, and self-disclosure) and nonverbal (i.e., physical proximity, touch, eye contact, facial expressions and gestures) immediacy

behaviours can lessen the psycho-logical distance between them and their students, thereby leading to increased learning (Swan, 2001). The instructor is especially valuable in responding to the learner's application of new knowledge (Moore, 1989).

Table 4. LTTD Variable means and Standard Deviations

	SD	A	D	SD	Mean	Std. Deviation
I communicate with my teachers all the time when I need help	17(10.1)	105(62.5)	37(22)	9(5.4)	2.2798	.85419
my teachers often respond to my questions	16(9.5)	92(54.8)	52(31)	(5(3)	2.3393	.79542
I receive prompt feedback from my teachers	24(14.3)	100(59.5)	44(262)	-	2.1786	.70347
I do reply to my teachers emails	25(14.9)	109(64.9)	29(17.3)	5(3.0)	2.1131	.76154
my teachers help out with my practical work	26(15.5)	99(58.9)	43(25.6)	-	2.1488	.69764
my teachers are available whenever I need them	19(11.3)	119(70.8)	26(15.5)	4(2.4)	2.1131	.68714
my teachers help me out with learning resources	54(32.1)	86(51.2)	28(16.7)	-	1.8452	.68332
my teachers help me with personal emotional guidance	39(23.2)	91(54.2)	38(22.6)	-	1.9940	.67900
my teachers help me with career guidance	37(22)	93(55.4)	38(22.6)	-	2.0060	.67012
my teachers help with academic counseling	40(23.8)	88(52.4)	40(23.8)	-	2.0000	.69213

4.4 Leaner – Content Transactional Distance

Most items measuring Leaner-Content transactional distance on the other hand generally registered a high mean score >2.5 with the item stating that course objectives are present in the study units registering the highest mean score of 3.1667 and a standard deviation of .95194. Item 1 (I have received all the study units in my course) registered the lowest mean score of 1.8452 with a standard deviation of . 89569 meaning that most students do not receive all the required course modules. Majority of the students (83.3%) were rated as experiencing low transactional distance with the course content and only a few 13.1% were rated as experiencing high Transactional distance with the course content. Overall, Learner – Content TD registered a mean score of 26.7738 slightly above 25(group mean score). This implies that majority of the students do connect with the course modules and that they are generally satisfied with them. course modules aspects such provision for additional references (ME= 2.7917) illustrations in the course modules (ME= 2.8810, SD= 1.03130) match between course objectives and exam (ME= 2.8929, SD =.78180) among other aspects. According to Moore (1989) Learner-content interaction results in "changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind.." Factors that affect students' perception of learning the course content include continuous contact with the content, clarity of course design, perception of currency of content (up to date content) and clear course objectives that are reflected on the exams that the students participate in. The present analysis generally revealed that most of the students were satisfied with these aspects of the course modules other than of the dissatisfaction with availability of some of the course modules. See table 5 which summarizes the mean scores of the Likert items measuring LCTD.

Table 5. LCTD Variable means and Standard Deviations

	SA	D	A	SD	Mean	Std. Deviation
I have received all the study units in my course	65(38.7)	77(45.8)	20(11.9	6(3.6)	1.8452	.89569
Course objectives are present in the study units	6(3.6)	18(10.7)	114(67.9)	30(17.9)	3.1667	.95194
Objectives in the course module are clear	3(1.8)	27(16.1)	119(70.8)	19(11.3)	3.0238	.81859
Course content is difficult to understand	14(8.3)	96(57.1)	49(29.2)	9(5.4)	2.3571	.82102
Content in the study units is up to date	8(4.8)	43(25.6)	89(53)	28(16.7)	2.9524	1.01374
Illustrations in the study units are clear	10(6)	47(28)	87(51.8)	24(14.3)	2.8810	1.03130
Adequate learning activities are provided for in the course	7(4.2)	80(47.6)	67(39.9)	14((8.4	2.5833	.84355
Media diagrams illustrations are clear	28(16.7)	69(41.1)	65(38.7)	6(3.6)	2.2917	.78423
Additional references are provided after every lecture	16(9.5)	47(28)	83(49.4)	22(13.1)	2.7917	1.07143
Objectives in the course units do match exams	7(4.2)	29(17.3)	121(72)	11(6.5)	2.8929	.78180

4.5 LLTD, LTTD and LCTD as Predictors of Learner Satisfaction

This study went further to measure the relationship between the three variables as predictors of students' satisfaction with the course. To achieve this, Spearman's rho correlation coefficients were calculated for all identified predictor Components of transactional distance i.e. LLTD, LTTD and LCTD paired with the criterion/ dependent variable - Student Perceived satisfaction with DE course (SPS). Spearman's rho coefficient was used instead of the Pearson coefficient because most variables were of ordinal nature. Contingency tables were created and regrouped when necessary, and the test calculations performed using SPSS. Results of this analysis are discussed below.

Results indicated that there was a strong, positive correlation with all three predictors. The first research question, "To what extent is leaner-leaner Transactional distance predictive of students perceived satisfaction with the course ?". Results indicated that LLTD and SPS was statistically significant (r_s = .996, p = 0.05). See table 6. This means that there is a strong relationship between leaner - learner transactional distance and perceived students satisfaction with the course i.e. if students experience more distance amongst themselves, they are likely to be dissatisfied with the course and likewise, if students experience less distance amongst themselves (that they interact and have feelings of connectedness), they are more likely to be satisfied with the course. From this analysis therefore, it can be concluded that LLTD is a predictor of SPS. This results concurs with other studies that have confirmed the same (More 1989, Alavi, 1994; Palloff & Pratt, 2001). Moore (1989) observed that Learners interacting with one another within a learning community can allow them to overcome their isolation and strengthen their relationship with the group.

Table 6. Relationship between Predictor variables and students satisfaction with the DE Course

	Predictor Variables		Leaner learner transactional distance	Learner-teacher transaction	Learner-content Transactional Distance	Student perceived satisfaction with DE course
Spearman's rho	Leaner- Learner transactional distance	Correlation Coefficient	1.000	.183[*]	.313[**]	.003
		Sig. (2-tailed)	.	.017	.000	.966
		N	168	168	168	168
	Learner-Teacher transaction	Correlation Coefficient	.183[*]	1.000	.161[*]	.012
		Sig. (2-tailed)	.017	.	.038	.874
		N	168	168	168	168
	Learner-Content Transactional Distance	Correlation Coefficient	.313[**]	.161[*]	1.000	.328[**]
		Sig. (2-tailed)	.000	.038	.	.000
		N	168	168	168	168
	student Perceived satisfaction with DE course	Correlation Coefficient	.003	.012	.328[**]	1.000
		Sig. (2-tailed)	.966	.874	.000	.
		N	168	168	168	168

*. Correlation is significant at the 0.05 level (2-tailed).

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

The second research question, "is learner-teacher TD a predictor of students perceived satisfaction with the course ? Results indicated that LTTD and SPS was statistically (r_s = ..874, p = 0.05). This means that there is a strong relationship between learner-Teacher transactional distance and perceived students satisfaction with the course i.e. if students experience more distance between themselves and the teachers, they are likely to be dissatisfied with the course and likewise, if students experience less distance between them and the teachers, they are more likely to be satisfied with the DE course. From this analysis therefore, it can be concluded LTTD is indeed a predictor of SPS. These results concur with similar studies that have confirmed the same (Chickering & Ehrmann, 1996; Chickering & Gamson, 1987; Moore & Kearsley, 1996). For example, Moore (1980) posits that the physical distance that exists in e-learning courses between the teacher and the students may result in a psychological and communicational gap between them. Such a gap will often impede the ability of the teacher and his or her students to achieve the desired level of understanding among them.

The third research question ''to what extent does learner-content Transactional distance serve as a predictor of perceived

learner satisfaction with course?'' Again spearman's Rank Order correlation results indicated that LCTD and SPS was statistically significant (r_s = .328 **p** = 0.01) This means that there is a strong relationship between learner-content transactional distance and perceived students satisfaction with the course i.e. if students experience more distance between themselves and the content, that they find the course content difficult to follow or perceive the course design as poor, they are likely to be dissatisfied with the course. Likewise, if students experience less distance between them and the content, they are more likely to be satisfied with the DE course. These results also concur with similar studies that have confirmed the same. For example factors that affect students' perception of learning the course content include continuous contact with the content (Leasure, Davis, & Thievon, 2000); clarity of course design (Swan, 2001); time; participation in online discussions and mode of delivering course content.

4.6 Hypothesis Testing

A correlation analysis was tested to explore the relationships between the predictor variables (LLTD, LTTD and LCTD) and the Response variables, students Perceived satisfaction (SPS). Results of this analysis presented in table 7 indicate that the three predictor variables had a significant statistical association with the response variable – Students perceived satisfaction (SPS). The results of the regression indicated that the three predictors explained 31.6% of the variance (R^2= 0.100, F (6, 49) = 42.58, p < 0.001). Student satisfaction was significantly predicted by the three predictor variables LTTD, (ß = -.0266, p < .746), LCTD (ß = 0.258, p < 0.002), and LLTD (ß = 0.111, p = .214). From this analysis, all the three null hypotheses were rejected and the alternative - that LTD, LTTD and LCTD is predictive of Learner satisfaction accepted. See also table 8.

Table 7. Regression analysis Results with Perceived student satisfaction as Response (SPS) variable

	Standardized beta coefficient	t-value	Significance
Constant		6.832	.000
LTTD	-.026	.325	.746
LCTD	.258	3.093	.002
LLTD	.111	1.248	.214

Table 8. Results of Hypothesis Testing

Hypotheses	Statement	Accepted or rejected
Ho1	Leaner-leaner Transactional distance is not predictive of students perceived satisfaction with the course	Rejected
Ho2	Learner-Teacher Transactional distance is not a predictor of students perceived satisfaction with the course	Rejected
Ho3	Learner-Content Transactional distance does not serve as a predictor of perceived learner satisfaction with course	Rejected

5. Discussions, Conclusions and Recommendations

The students in this survey were not only able to identify their experiences of different forms of transactional distance that they experience as learners but were also able to state their position in terms of their satisfaction with the course. Results of the study clearly indicated that the theory predictor variables (LLTD, LTTD, LCTD) were all positively correlated with perceived students' satisfaction with the DE course. This calls for ways and means of lowering or decreasing the learning transactional distance experienced DE students. Results indicated that teacher –student transactional distance was one experienced by most of the students in this study. More opportunities perhaps need to be provided for students to interact more with the teachers. Teacher-student interactions are important not only in motivation of learners but are also important in reinforcing student understanding of the material presented to them and elucidating meanings. Existing literature indicates that teachers' verbal behaviours such as giving praise, soliciting viewpoints, humour, and self-disclosure and nonverbal actions such as physical proximity, touch, eye contact, facial expressions and gestures all can lessen the psychological distance between teachers and their students, thereby leading to increased learning (Swan, 2001). The Teacher is particularly valuable in responding to the learner's application of new knowledge.

DE teachers need to be well trained to appreciate their roles in facilitating learning in DE courses. One of the challenges faced by DE programs offered in a Dual systems (Where both conventional and DE approaches are used in delivering courses) is the use of teachers who are accustomed to Conventional face to face tutoring. Often in such circumstances, the teachers are not given any additional training to help them manage distance education programs. This often results

to the faculty using the same approaches used in face- face tutoring with total disregard of the special needs and demands of the DE learner and DE approaches. There is need therefore to make deliberate efforts to train and orientate this faculty and equip them with the necessary capacity to manage DE learners and programs.

Results of this study also indicated that learner – content interaction was highly valued by the students. Considering that these are distance learning students, interaction with content is fundamental in the whole learning process. However, effectiveness of learner - content interaction may be affected by many factors such as adequate availability of the content, continuous contact with the content, clarity of course design, and other factors such as adequate time for the learners to go through the content. This calls for deliberate effort to be made in ensuring effective course design and availability of adequate content in the form of study learning resources and effective connectivity where the courses are offered online. There is also need to train students in study skills and management of time for them to reap maximum benefits of course content.

Whereas learner – learner TD and Learner - content TD did not score poorly in this analysis, there is need to make sure that students are given many opportunities for collaborative learning. Learners interacting with one another within a learning community can allow them to overcome their isolation and strengthen their relationship with the group.

6. Limitations of the Study and Areas for Further Research

Generalizability of the results of this study beyond the research setting may be limited by the following factors. One, only quantitative analysis was used and therefore more detailed in-depth explanation of the theory variables were not exhaustively explained. Secondly, the sample was limited to students following a Bachelors of Education Arts program. Perhaps an analysis with more diversified subject areas could capture interpretations that were beyond the scope of this study. Perhaps further research could be directed to the same research question but with diversified subject areas such as the sciences. Larger samples could also be used to see whether such an analysis would yield same results.

References

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

Alavi, M. (1994). Computer-mediated collaborative learning: an empirical evaluation. *MIS Quarterly*, *18*, 159–174. http://dx.doi.org/10.2307/249763

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

Belair, M. (2012). The investigation of virtual school communications. *TechTrends, 56*(4), 26-33. http://dx.doi.org/10.1007/s11528-012-0584-2

Benson, R., & Samarawickrema, G. (2009). Addressing the context of e-learning: Using transactional distance theory to inform design. *Distance Education, 30*(1), 5-21. http://dx.doi.org/10.1080/01587910902845972

Cortina. J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78*, 98–104. http://dx.doi.org/10.1037/0021-9010.78.1.98

Chen, Y. (2001a). Transactional distance in World Wide Web learning environments. *Innovations in Education and Teaching International, 38*(4), 327-338. http://dx.doi.org/10.1080/14703290110074533

Chen, Y. (2001b). Dimensions of transactional distance in the world wide web learning environment: A factor analysis. *British Journal of Educational Technology, 32*(4), 459-470. http://dx.doi.org/10.1111/1467-8535.00213

Chickering, A. W., & Ehrmann, S. C. (1996). October. Implementing the Seven Principles: Technology as Lever. AAHE Bulletin, 49 (2): 3-6.

Chickering, A. W., & Gamson, Z. F. (1987). Seven Principles of good practice in undergraduate education. *AAHE Bulletin, 39*(7): 3-7.

Dewey, J. (1916). *Democracy and Education*. New York: Macmillan. Retrieved May 21, 2001 from: http://www.ilt.columbia.edu/projects/digitexts/dewey/d_e/contents.html

Fallon, G. (2011). Making the connection: Moore's theory of transactional distance and its relevance to the use of a virtual classroom in postgraduate online teacher education. *Journal of Research on Technology in Education, 43*(3), 187-209.

Frey, B. A., Alman, S. W., Barron, D., & Steffens, A. (2004). Student satisfaction with the online MLSI program at the University of Pittsburgh. *Journal of Education for Library and Information Science, 45*, 82–97.

http://dx.doi.org/10.2307/40323896

Holmberg, B. (1983). Guided didactic conversation in distance education. In D. Sewart, D.Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

Holmberg, B. (1989). *Theory and practice of distance education*. London: Routledge.

Holmberg, B. (1995). The evolution of the character and practice of distance education. *Open Learning, 10*(2), 47-53. http://dx.doi.org/10.1080/0268051950100207

Kearsley, G. (2000). *Online education: Learning and teaching in cyberspace*. Belmont, CA: Wadsworth/Thomson Learning.

Kearsley, G. (1996). Structural issues in distance education. *Journal of Education for Business, 71*(4), 191. http://dx.doi.org/10.1080/08832323.1996.10116783

Kostina, M. V. (2011). Exploration of student perceptions of autonomy, student-instructor dialogue and satisfaction in a web-based distance Russian language classroom: a mixed methods study. doctoral PhD diss., University of Iowa, http://ir.uiowa.edu/etd/1003.

Leisure, A., Davis, L., & Thievon, S. (2000). Comparison of student outcomes and preferences in a traditional vs. world wide web -based baccalaureate nursing research course. *Journal of Nursing Education, 39*(4), 149–154.

Mason, R. W., & Weller, M. (2000). Factors affecting students' satisfaction in a web course. *Australian Journal of Educational Technology, 16*, 173–200

Merriam, S. B. (1995). What can you tell from an N of 1? Issues of validity and reliability in qualitative research. *PAACE Journal of Lifelong Learning, 4*, 51-60.

Miyazoe, T. (2009). LMS -based EFL blended instructional design: Empirical research on the sense of class community, learning styles, and online written interaction. (Unpublished doctoral dissertation). International Christian University, Tokyo.

Miyazoe, T., & Anderson, T. (2010). Empirical research on learners' perceptions: Interaction Equivalency Theorem in blended learning, with Terry Anderson, European Journal of Open, Distance and E -Learning, retrieved from http://www.eurodl.org/?article=397

Moore, M. G. (1972). Learner autonomy: The second dimension of independent learning. *Convergence, 5*(2), 76-88.

Moore, M. G. (1973). Towards a theory of independent learning and teaching. *The Journal of Higher Education, 44*(9), 661-679. http://dx.doi.org/10.2307/1980599

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education, 3*(2), 1-6. http://dx.doi.org/10.1080/08923648909526659

Moore, M. G. (1990). Recent contribution to theory of distance learning. *Open Learning, 5*(3), 10-15. http://dx.doi.org/10.1080/0268051900050303

Moore, M., G. (2007). The theory of transactional distance. In M. G. Moore (Ed.), *Handbook of distance education* (2nd Ed., pp. 89-105). Mahwah, NJ: Lawrence Erlbaum Associates.

Moore, M. G, & Kearsley, G. (2005). *Distance education: A system view* (2nd ed.). Belmont, CA: Wadsworth Publishing.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education, 3*(2), 1-6. http://dx.doi.org/10.1080/08923648909526659

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

Nunnally, J. C. (1978). *Psychometric Theory, 2nd ed*. New York: McGraw-Hill

Palloff, R. M., & Pratt, K. (2001). *Lessons from the cyberspace classroom: The realities of online teaching*. San Francisco, CA: Jossey-Bass.

Revelle, W. (1979). Hierarchical cluster analysis and the internal structure of tests. *Multivariate Behavioral Research, 14*, 57–74. http://dx.doi.org/10.1207/s15327906mbr1401_4

Rogers, C. (1969). *Freedom to learn* (1st ed.). New York, NY: Macmillan/Merrill

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education 12*. Retrieved July 15, 2003 from: http://www.atl.ualberta.ca/cmc/2Rourke_et_al_Content_Analysis.pdf

Saba, F., & Shearer, R. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *American Journal of Distance Education, 8*(1), 36 – 59. http://dx.doi.org/10.1080/08923649409526844

Starr-Glass, D. (2011). Military Learners: Experience in the design and management of online learning environments. *Journal of Online Learning and Teaching, 7*(1), 147-158. Retrieved from http://jolt.merlot.org/vol7no1/starr-glass_0311.pdf

Shin, N. (2002). Beyond interaction: the relational construct of transactional presence. *Open Learning, 17*(2), 121-137. http://dx.doi.org/10.1080/02680510220146887

Shin, N. (2003). Transactional presence as a critical predictor of success in distance learning. *Distance Education, 24*(1), 69-86. http://dx.doi.org/10.1080/01587910303048

Solimeno, M., & Tomai, F. (2008). The influence of students and teachers characteristics on the efficacy of face-to-face and computer supported collaborative learning, http//.www.sciencedirect.com

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education, 22*, 306-331. http://dx.doi.org/10.1080/0158791010220208

Thurmond, V. A., Wambach, K., Connors, H. R., & Frey, B. B. (2002). Evaluation of student satisfaction: Determining the impact of a Web-based environment by controlling for student characteristics. *The American Journal of Distance Education, 16*, 169-189. http://dx.doi.org/10.1207/S15389286AJDE1603_4

Thurmond, V. A. (2003). Examination of interaction variables as predictors of students' satisfaction and willingness to enroll in future Web-based courses while controlling for student characteristics. Published Dissertation. University of Kansas. Parkland, FL: Dissertation.com. Available online http://www.dissertation.com/library/1121814a.htm

Trentin, G. (1998). Computer conferencing systems seen by a designer of onlinecourses. *Educational Technology, 38*(3), 36-43.

Zimmerman. (2012). Denise Exploring learner to content interaction as a success factor in online courses. *The International Review in Open and Distance learning*, *13*(4), Athabasica University.