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Oğuz Onat   
Istanbul University, Turkiye

Yasemin Bertiz   
Karamanoğlu Mehmetbey University, Turkiye

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# The Effects of Instant Messages on Distance Education Students' Perception of Transactional Distance

Oğuz Onat, Yasemin Bertiz

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## Abstract

In this study, effects of instant messages that are sent on a regular basis to the distant education students on how they perceive transactional distance were investigated. These text messages are designed to have either an informative or a mindful nature. Participants were undergraduate students that were randomly assigned to four groups (N=99). Participants in this study who attended distance education classes online regularly received instant messages. The impact of these text messages on students' perceptions of transactional distance was assessed using Perceived Transactional Distance Scale in Distance Education Environments (Horzum, 2011). Dialogue, Structure Flexibility, Content Organization, Control, and Learner Autonomy were the five subscales that made up the survey. The instant messages were intended to have little to no effect on the dynamics and content of the class. The students received all of the texts over WhatsApp. The hypothesis which those students receive instant messages periodically will have lower score of perception of transactional distance was largely supported.

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## Introduction

Many definitions of distant learning have been introduced to literature as a result of the swift development of communication technologies. Distance learning takes place in a setting where learners are physically in different places (Georgieva, & Goranov, 2021; Patriarcheas & Xenos, 2009; Perraton, 2010; Sachyani, Gal, & Gross-Yarom, 2022). Distance education is a form of education where both teaching and learning occurs in geographically distinct locations (Moore and Kearsley, 2012). Although there are many definitions of distance learning, all agree that it involves students and instructors not being in the same physical location. It's possible that there's also a "time" distance in addition to this "physical" distance. In other words, distance learning and teaching can happen at different times. However, this is not an obligation. The only critical factor is the geographic distance. The learner, teacher, and course content are brought together through distance education, which also enhances the learning process by providing a variety of possibilities. (Yousuf, 2007).

The teacher's endeavor to teach is one that is not always successful (Holmberg, 1995). Teachers should be aware of the variety of learning styles that students have. Planned learning and teaching are both components of distance education (Moore & Kearsley, 2012). Information technology and institutional organizations serve as a bridge in distance education since teaching and learning take place in separate areas geographically. According to Moore

and Kearsley (2012) “planned” learning in distance education means that students are to be more autonomous in their learning process with respect to conventional education.

In proportion to population growth, there is a corresponding rise in educational demand. In terms of infrastructure and competent specialists, it becomes more difficult to meet the demand of pupils receiving traditional education. Therefore, existing resources like infrastructure, learning tools, and staff like competent instructors and administrators are insufficient to meet the demands of modern educational standards. According to Lau and Yuen (2014) In order to meet the demands of mass education, distance education is a crucial and effective solution. The Covid-19 global epidemic was a major factor in the dysfunctional state of conventional education. Students were able to continue their studies anywhere in the world thanks to online education. Learners can take part in distance education thanks to recent advancements in information technology, particularly in terms of Internet connection. The drawbacks of traditional education can be improved with web-based distance learning (Ozturk, 2023; Tüysüz & Aydın, 2007).

Distance learning does, however, have some drawbacks. Drokina (2020) cites factors such as a high dropout rate, the high cost of qualified employees and technical equipment, and weak teacher-student communication. Many theories have been developed to explain the dynamics of distant learning and offer solutions to its shortcomings. The transactional distance theoretical model, developed in 1972, claims that there are cognitive as well as geographical limitations separating the teacher and the student (Moore, 1973). Moore's transactional distance theory utilized Dewey and Bentley's transaction idea (Moore, 1993). The term "transaction" refers to how the environment, people, and behavior patterns interact during an occurrence (Dewey & Bentley, 1949; Boyd & Apps, 1980). Building on the idea of transaction, Moore hypothesized that this physical distance was actually a psychological and communicational distance between the student and the instructor. Geographical distance between the learner and the teacher in distance learning has several effects on the educational process. Transactional distance was used to describe the psychological and communicative space that could lead to misunderstandings between the student and the teacher (Moore, 1993). McIsaac and Gunawardena (1996) assert that transactional distance is not just applicable in online learning environments but also in traditional classroom settings.

According to Moore (1993), transactional distance is more of a relative concept than an absolute one because it differs for each student. Moore proposed that the transactional distance was a product of dialogue, structure, and learner autonomy rather than being determined by geographic distance (Moore, 1993; Moore & Kearsley, 2012).

## **Dialogue**

According to Moore (1993), dialogue is a sequence of conversations that have a goal, are helpful, and are valued by both parties. Moore (1993) claims that dialogue is influenced by communicational means, subject, student character, instructor personality, and student population. Subsequent research, nevertheless, included a range of variables that influence dialogue in their operational definitions, including the quantity of communications and discourse analysis (Saba & Shearer, 1994), the quantity and duration of communications (Bunker, Gayol, Nti &

Reidell, 1996), and the quantity of communications (Bischoff, Bisconer, Kooker & Woods, 1996; Chen & Willits, 1998).

## **Structure**

Structure denotes the degree of rigidity and flexibility of educational programs' goals, instructional approaches, evaluation strategies, and ability to meet learners' unique requirements through course components (Moore, 1993; Moore & Kearsley, 2012). A program's structure is impacted by the teaching style and character of the instructors, the nature of communication channels, and other limitations imposed by the educational institutions (Moore, 1993). Later research employed many structure-affecting elements in their operational definitions, including; pace, sequence, instant messaging and content organization (Saba & Shearer, 1994), instructional design (Bunker et. al., 1996), activities and number of students (Bischoff et. al., 1996), the degree of asynchronous online interaction and learner assistance (Chen, 2001b).

## **Learner Autonomy**

The term "learner autonomy" describes how much control learners have over their own learning objectives, experiences, and program choices. (Moore, 1993). Subsequent studies identified the student's independence or interdependence as the critical component that identifies learner autonomy. (Chen, 2001a).

According to Gorsky & Caspy (2005) most empirical research on transactional distance are to be criticized, they assert that some of them lack construct validity, merely providing fragmentary evidence. However, the results of various studies indicated that dialogue, structure, and autonomy are important predictors of learners' perceptions of transactional distance (Bischoff, et al, 1996; Saba & Shearer, 1994).

Horzum (2013) classified the interaction levels in distance education programs as following, full transactional distance, high transactional distance, medium transactional distance and low transactional distance. Full transactional distance tends to happen when program style of the distance education has low level of dialogue and low level of structure whereas high transactional distance takes place on the conditions that low level of dialogue and high level of structure. Medium transactional distance manifests when the circumstances of high level of dialogue and high level of structure is present within the program style meanwhile low transactional distance appears in settings where high level of dialogue and low level of structure exists together (see Table 1).

Table 1. Levels of Transactional Distance in Distance Education Programs

Interaction Level	Program Style
Full Transactional Distance	Low Dialogue, Low Structure
High Transactional Distance	Low Dialogue, High Structure
Medium Transactional Distance	High Dialogue, High Structure
Low Transactional Distance	High Dialogue, Low Structure

Source: Horzum (2013)

## **Instant Messaging**

The literature has examined instant messaging services on the context of education. Hrastinski, Edman, Andersson, Kawnine, and Soames (2014) reports high school students that utilized an anonymous forum or an instant messaging program to get help in math, they preferred the latter. This occurred as a result of their ability to communicate with the teacher and ask questions outside class hours. The instructor, in turn, was able to assist students more specifically and personally. The college students that utilize the internal SMS system that the university created participate more and ask questions more frequently (Scornavacca, Huff, & Marshall, 2009). While Cifuentes and Lents (2011) discovered that students who use instant messaging services have more personal interaction with faculty as well as interaction related to the course content, Smit (2012) asserts that using diverse instant messaging between faculty and class consequences in substantial increase in learning augmentation.

The impacts of social media use as a learning tool have also been explored in literature, Facebook helps improve social contact, group collaboration, and communication between learners and lecturers, reported by Fewkes and McCabe (2012) and Wang, Woo and Quek (2012). Twitter, to the contrary hand, offers potential that is comparable, yet students report that due to the character limit for text messages, conversations on Twitter tended to be limited (Gao, Luo & Zhang, 2012; Leitch & Warren, 2011).

Recently, there has been a surge in the popularity of WhatsApp, a well-liked messaging app, in education thanks to the widespread use of smartphones. This messaging app serves as a social network for the classroom for both students and teachers (Fischer, 2013; Ozturk & Ozturk, 2022). Church and de Oliveira (2013) identified the factors that a large number of individuals use WhatsApp as their primary method of communication as follows: the app's minimal cost, unrestricted message sending capability, responsiveness, being popular within and between friends and colleagues, allowing user to perform multiple communications at once, enables consumers to form a network of friends, and in comparison, to other social network alternatives, it offers a feeling of privacy.

Instant messaging's role in education has been examined in the literature from numerous angles, including its contribution to learning, cooperation, and active engagement. However, instant messaging has not been widely adopted in the context of distance education and has not been implemented in a setting that takes transactional distance into account.

## **Purpose of the Study**

This study investigates how frequently delivered educational instant messages can lessen the perceived transactional distance among university students enrolled in distant learning courses. Additionally, it aims to determine which instant message combinations of dialogue, structure, or learner autonomy is best for minimizing undesirable outcomes.

The study's primary questions are as follows:

1. How do distance education students' perceptions of transactional distance change when they receive regular

informational instant messages?

- 1a. Do students' scores of perceptions of the flexibility of structure, the organization of the content, control, and learner autonomy improve when they receive regular, informative instant messages that target both autonomy and structure?
- 1b. Do students' scores of perceptions of the flexibility of structure, the organization of the content, dialogue improve when they receive regular, informative instant messages that target both dialogue and structure?
- 1c. Do students' scores of perceptions of dialogue and control and learner autonomy improve when they receive regular, informative instant messages that target both dialogue and learner autonomy?
- 1d. Do students' scores of perceptions of structure flexibility, content organization, dialogue, control and learner autonomy improve when they receive regular, informative instant messages that target structure, dialogue and learner autonomy?
- 1e. Does expanding the variety of instant messages with a focus on dialogue, structure, and learner autonomy assist to lessen the perception of transactional distance?

## **Method**

### **Study Design**

This study used an experimental pretest-posttest approach to investigate the impact of recurrent informative instant messaging on students' perceptions of transactional distance. All groups received surveys at the start and end of the distance education course. The independent variables of this study included periodic instructive instant messages related to autonomy, structure, and communication with different combinations. Perceived transactional distance was a dependent variable. All students received typical instant messages from the course via email, but experimental groups also received additional messages using a well-known messaging app that was downloaded onto their smartphones.

### **Setting**

In a private university located in Istanbul, Turkey, the research was carried out. Both undergraduate and higher education vocational students at this university are required to take a number of online courses each semester. These courses are Foreign Language I, Turkish Language, and Information and Communication Technologies for the fall semester. For the spring semester, they are Foreign Language II, Turkish History. Lessons in information and communication technologies and Turkish language are taken during the first year; the others are covered during the second.

On weeknights, these online classes are held through web conference. Except for Turkish language lessons, which last 80 minutes with a 10-minute break in the middle, each lesson includes one weekly class that lasts an entire hour without a break. Since a semester consists of fourteen weeks, fourteen online classes are held during an academic term.

Lessons are infrequently postponed due to a technical issue or the instructor's unavailability; nonetheless, make-

up sessions are organized, and students are notified. Students are enrolled in the university's distance education system in addition to their online classes, which is essentially a web based LMS with a few more specialties. Although it is up to the instructor, he or she may decide to post the materials weekly. Course materials are typically uploaded in the system at the start of the semester. The instructor may modify his or her choice if pupils submit suggestions regarding the matter. Additionally, the instructor has the option to upload other materials like presentations utilized in class.

Additionally, there is interactive content available for each course. Two midterms are given to students, often in the fifth and tenth weeks of the semester. Each midterm contributes to 4% of the overall mark. These midterm exams are held in online manner. A midterm could only be taken once during a specific one-week period. These tests typically have 20 multiple-choice questions that must be answered within 30 minutes.

In addition, there is some interactive content available for each course. Two midterms are assigned to students, often in the fifth and tenth weeks of the term. Each midterm contributes toward 4% of the overall mark. These midterm exams are held in online environment. A midterm could only be taken once during a specific one-week period. These tests typically have 20 multiple-choice questions that must be answered in 30 minutes.

Moreover, students must turn in an assignment to the system each semester. Students typically have four weeks to turn in their homework after the instructor selects the subject and publishes it to the system. This assignment will contribute in %28 to their overall course grade.

At the end of the semester, final exams for distance learning courses are administered in person much like conventional exams. In final exams, there are typically 25 to 40 multiple-choice questions. Final exams contribute in 60% of a student's overall course grade. The distance education office can be contacted via phone, email, or in person by students. Additionally, they can message their instructors using the LMS.

### **Participants and Sampling**

The population of this study consisted of all undergraduate and students who attend higher education vocational schools. convenience sampling method was used in this research. Students were selected from first- and second-year undergraduate who were enrolled in various academic departments and programs at the institution. Participants ranged in age from 18 to 21. There were 160 distance learners in total who were contacted, and 99 of them accepted to participate.

The experimental groups each included 23, 20, 17, and 21 participants, whereas the control group had 18 participants. Male and female participants numbers were taken into account in the process of forming the groups. Only messages relating to the learner's autonomy and the structure's subdimensions were provided to participant group 1 whereas participant group 2 were only sent messages regarding subdimensions of structure and dialogue. While participant group 4 received messages about subdimensions of structure, dialogue, and learner autonomy, participant group 3 received messages only about subdimensions of dialogue and learner autonomy.

## **Data Collection Instruments**

The perception of transactional distance scale (Horzum, 2011) was employed in this research. All participants received a pretest on the perception of transactional distance, and all groups received a posttest on the perception of transactional distance following the intervention.

### **Perception of Transactional Distance Scale**

The perception of transactional distance scale, designed by Horzum (2011), was utilized in this study to measure the students' perceptions of this distance. The subjects were given the scale ( $\alpha = .92$ ) both prior to and following the intervention. It uses 38 items to measure the perception of transactional distance.

Autonomy, dialogue, content organization, structure flexibility, and learner control are the five subscales that compose the overall measurement tool. There are nine items in the autonomy subscale ( $\alpha = .82$ ), eight in the conversation subscale ( $\alpha = .91$ ), eight in the content organization subscale ( $\alpha = .91$ ), seven in the structure flexibility subscale ( $\alpha = .91$ ), and six in the learner control subscale ( $\alpha = .87$ ). Responses are graded on a 5-point Likert scale, with the options being totally agree, agree, neutral, disagree, and totally disagree.

### **Analysis**

Before their final exam at the end of the autumn semester, students completed a survey that measures their perception transactional distance .The majority of students completed the questionnaire using paper and pencil and finished it in under 20 minutes. Some of the students needed to complete the survey electronically, therefore it was converted to Google Forms and a link was delivered to their email addresses via the LMS system of the department of distant education. The information about the survey was included at the start of the questionnaire in the survey's electronic form. The survey's deadline was due in two weeks. Same method was used at the end of spring semester on electronic form.

### **Pretest and Posttest**

The distribution of each group's pretest and posttest scores was examined using a normality test after the transactional distance scale's subscale scores had been calculated. The effects of regular informative instant messages were examined using paired samples t-test, which was utilized if the data were normally distributed. Wilcoxon signed ranks test was employed if the data was not normally distributed.

## **Results**

Due to the pretest and posttest design, the difference between the two tests must have a normal distribution in order to utilize the Paired Samples t test. All data sets' subdimensions exhibit a normal distribution, with the exception of the dialogue subdimension in Group 4. As a result, paired samples t tests are employed for the



analysis of all subdimensions, and a Wilcoxon signed-rank test is utilized for the subdimension of dialogue in Group 4.

**Paired Samples t-test Results for Each Group**

Results of the Paired Samples t-test for Participant Group 1, which only received messages about the structure and learner autonomy subdimensions are as follows:

Students in Group 1 did not significantly differ in their scores between the pretest and posttest conditions  $t(22) = -0.608, p = .549$  for dialogue perception (see Table 2).

Students in Group 1 did not significantly differ in their scores between the pretest and posttest conditions  $t(22) = 1.506, p = .146$  for structure flexibility perception (see Table 2).

Students in Group 1 did not significantly differ in their scores between the pretest and posttest conditions  $t(22) = 1.688, p = .106$  for content organization perception (see Table 2).

Students in Group 1 did not significantly differ in their scores between the pretest and posttest conditions  $t(22) = -0.717, p = .481$  for control perception (see Table 2).

Students in Group 1 did significantly differ in their scores between the pretest and posttest conditions  $t(22) = 2.265, p = .034$  for learner autonomy perception (see Table 2).

Table 2. Paired Samples t-Test of Group 1

Subdimension	n	Mean Difference	SD	t	p
Dialogue	23	-1.000	7.885	-0.608	0.549
Structure Flexibility	23	1.739	5.537	1.506	0.146
Content Organization	23	2.087	5.930	1.688	0.106
Control	23	-0.826	5.524	-0.717	0.481
Learner Autonomy	23	3.304	6.993	2.265	0.034

Results of the Paired Samples t-test for Participant Group 2, which only received messages about the structure and dialogue subdimensions are as follows:

Students in Group 2 did significantly differ in their scores between the pretest and posttest conditions  $t(19) = -3.570, p = 0.002$  for dialogue perception (see Table 3).

Students in Group 2 did significantly differ in their scores between the pretest and posttest conditions  $t(19) = -2.084, p = 0.05$  for structure flexibility perception (see Table 3).

Students in Group 2 did significantly differ in their scores between the pretest and posttest conditions  $t(19) = -2.497, p = 0.02$  for content organization perception (see Table 3).

Students in Group 2 did significantly differ in their scores between the pretest and posttest conditions  $t(19) = -2.040, p = 0.05$  for control perception (see Table 3).

Students in Group 2 did not significantly differ in their scores between the pretest and posttest conditions  $t(19) = -0.867, p = 0.39$  for learner autonomy perception (see Table 3).

Table 3. Paired Samples t-Test of Group 2

Subdimension	n	Mean Difference	SD	t	p
Dialogue	20	-6.650	8.330	-3.570	0.002
Structure Flexibility	20	-2.500	5.365	-2.084	0.050
Content Organization	20	-4.200	7.522	-2.497	0.022
Control	20	-3.350	7.343	-2.040	0.050
Learner Autonomy	20	-1.750	5.025	-0.867	0.391

Results of the Paired Samples t-test for Participant Group 3, which only received messages about the dialogue and learner autonomy subdimensions are as follows:

Students in Group 3 did not significantly differ in their scores between the pretest and posttest conditions  $t(16) = -1.073$ ,  $p = 0.299$  for dialogue perception (see Table 4).

Students in Group 3 did not significantly differ in their scores between the pretest and posttest conditions  $t(16) = 1.802$ ,  $p = 0.090$  for structure flexibility perception (see Table 4).

Students in Group 3 did not significantly differ in their scores between the pretest and posttest conditions  $t(16) = -0.916$ ,  $p = 0.373$  for content organization perception (see Table 4).

Students in Group 3 did not significantly differ in their scores between the pretest and posttest conditions  $t(16) = -0.505$ ,  $p = 0.621$  for control perception (see Table 4).

Students in Group 3 did not significantly differ in their scores between the pretest and posttest conditions  $t(16) = -0.165$ ,  $p = 0.871$  for learner autonomy perception (see Table 4).

Table 4. Paired Samples t-Test of Group 3

Subdimension	n	Mean Difference	SD	t	p
Dialogue	17	-2.647	10.167	-1.073	0.299
Structure Flexibility	17	3.000	6.864	1.802	0.090
Content Organization	17	1.882	8.477	0.916	0.373
Control	17	-1.000	8.170	-0.505	0.621
Learner Autonomy	17	0.470	11.763	0.165	0.871

A Wilcoxon signed-rank test (see Table 5) revealed that a 14-week, three-times-weekly regular informative instant message treatment program did, in fact, cause an impact in group 4 students' dialogue perception in a statistically significant manner ( $Z = -2.684$ ,  $p = 0.007$ ).

Table 5. Wilcoxon Signed Ranks Test of Group 4's Perception of Dialogue Subdimension

Subdimension	n	Z	p
Dialogue	21	-2.684	0.007

Results of the Paired Samples t-test for Participant Group 4, which received messages about the structure, dialogue

and learner autonomy subdimensions are as follows:

Students in Group 4 did not significantly differ in their scores between the pretest and posttest conditions  $t(20)=-0.607$ ,  $p=0.551$  for structure flexibility perception (see Table 6).

Students in Group 4 did not significantly differ in their scores between the pretest and posttest conditions  $t(20)=-1.039$ ,  $p=0.311$  for content organization perception (see Table 6).

Students in Group 4 did not significantly differ in their scores between the pretest and posttest conditions  $t(20)=-0.423$ ,  $p=0.677$  for control perception (see Table 6).

Students in Group 4 did not significantly differ in their scores between the pretest and posttest conditions  $t(20)=1.074$ ,  $p=0.295$  for learner autonomy (see Table 6).

Table 6. Paired Samples t-Test of Group 4's Structure Flexibility, Content Organization, Control, Learner Autonomy Subdimensions

Subdimension	n	Mean	SD	t	p
Difference					
Structure Flexibility	21	-0.761	5.752	-0.607	0.551
Content Organization	21	-1.714	7.557	-1.039	0.311
Control	21	-0.666	8.227	-0.423	0.677
Learner Autonomy	21	1.809	7.717	1.074	0.295

## Discussion

According to Moore (1993) and Moore and Kearsley (2012), the factor of learner autonomy and distance learners' perception of transactional distance have an inverse connection. Additionally, the course structure and learner autonomy factors have a negative impact on how distant learners perceive transactional distance (Moore, 1993; Horzum, 2013). The findings indicate that when distance learners receive instant messages about the subdimensions of structure and learner autonomy, their perceived learner autonomy scores have declined. While students' perceptions of structure did not improve, the subdimension that measured learners' autonomy may have been negatively impacted by quick messaging about structure. As a result, the findings are consistent with the literature. However, it is advised that the two treatment groups in a new study get instant messages about the structure and learner autonomy subdimensions separately. This may be useful in dissecting the impact of individual instant messages so that outcomes can be examined with those of different subdimension combinations. As a result, the relationship between the subdimensions can be identified with more accuracy.

When social media is utilized as a tool to foster dialogues about their course, distant learners state that their perception of communication has improved (Bere, 2013; Smit, 2012; Scornavacca, Huff, & Marshall, 2009. Wang, Woo, & Quek, 2012). According to the findings, distance learners' perceived scores for dialogue, structure, and autonomy are greater when they receive instant messages that are related to both the structure and dialogue subdimensions at the same time. The increase in perceived dialogue scores is consistent with earlier findings (Bere, 2013; Smit, 2012; Scornavacca, Huff, & Marshall, 2009. Wang, Woo, & Quek, 2012). Even though they did not receive any instant messages on this subdimension, participants' perception of control scores increased,

which is unexpected. According to Moore (1993) and Horzum (2013), autonomy and structure have an adverse relation in terms of how they affect transactional distance. A plausible scenario would be pupils' perceived autonomy scores should not have altered due to these instant messages. Since the same circumstances held true for students who received instant messages about structure and learner autonomy, it is unlikely that this is the result of their perceived autonomy decreasing. The perception of control scores may have been indirectly impacted by the students' increased perception of discussion scores.

The findings suggest that sending instant messages to distance learners about the dialogue and autonomy subdimensions at the same time had no impact on their perception scores. These findings are inconsistent with dialogue subdimensions literature (Bere, 2013; Smit, 2012; Scornavacca, Huff, & Marshall, 2009. Wang, Woo, & Quek, 2012). It was anticipated that the introduction of a new communication tool to distance learners would result in an increase in perceived student dialogue (Calvo, Arbiol & Iglesias, 2014) For this treatment group, an exogenous variable may have had an impact. Instant messages for the autonomy and dialogue subdimensions should be delivered independently, and subset combinations of these subdimensions should also be studied at for a more in-depth examination in future research.

The results suggest that sending instant messages to distance learners about the subdimensions of structure, dialogue and autonomy combined has enhanced their scores for perceived dialogue. These findings are supported by other literature as well. A rise in the perceived dialogue, autonomy scores among distance learners has been seen as a result of these instant messages. Since the program's structure remained the same over the duration of the study's two semesters, an increase in participants' perceptions of structure indicates that their knowledge of the structure has grown as a result of the interventions used in this study.

The settings in this study more closely resemble Horzum's (2013) "no structure" scenario, which refers to not being able to perceive the course's organization. In the perspective of transactional distance, this circumstance is rated as being worse than having the perception that a program has a rigid structure. (Horzum, 2013). As a result, simply because a subdimension has a high perception score does not necessarily guarantee that it will result in greater perceived transactional distance than a subdimension with a low perception score. This transactional distance subdimension necessitates a more in-depth examination of student foreknowledge of the course's structure. A high perception of structure score also has the benefit of assisting in identifying the degree to which remote learners have control over their education. According to this perspective, a student's perception of autonomy could be increased by having a high score of perception of structure. These circumstances could perhaps help students recognize how they perceive transactional distance during the course.

Participants' perceived dialogue scores were anticipated to rise following the treatments, especially for participants who got instant messages about the dialogue subdimension, as suggested by the pertinent literature. (Bere, 2013; Smit, 2012; Scornavacca, Huff, & Marshall, 2009. Wang, Woo, & Quek, 2012). Even for students who did not get instant messages relating the dialogue subdimension, since treatment opened up a new communication path for distance learners, it was anticipated that their perceived dialogue scores would rise because of relevant studies. (Calvo, Arbiol & Iglesias, 2014). However, the findings of this study differed from those in the literature, and this

could be due to how distance learners perceived the dialogue subdimension. The rest of the interactions may not have been included in the students' view of the dialogue subdimension, which may only have included instant messages regarding the course itself. This could explain why participant scores of perceptions of dialogue did not always improve. Future study could include this while planning its design and concentrate on the messages and content that distance learners categorize as dialogue.

Text messages related to the autonomy subdimension did not provide conclusive evidence. The scores of participants' perceptions of autonomy, however, may be indirectly impacted by instant messages of other subdimensions. To construct treatment groups, it is necessary to segregate instant messages pertaining to each subdimension of transactional distance. Research should be done on the variations of the transactional distance subdimensions that were not included in this study. A different strategy for treatment planning may be necessary for the perception of autonomy subdimension.

## **Conclusion**

On the transactional distance perception of distance learners, the impacts of periodic informing instant messages on the subdimensions of autonomy, structure, and dialogue have been investigated. Distance learners (N=99) which were college students participated in the study in fall and spring semesters. For fourteen weeks, periodic informative instant messages were provided to four treatment groups of learner smartphones. The findings provided some indication of the impact of such periodic informational instant messages on distance learners' perceptions of transactional distance. This effect's characteristics were as follows: It seems plausible that sending frequent, educational instant messages to distance learning students would raise their perception of dialogue, content and structure scores, which would then reduce their perception of transactional distance scores. These findings are also supported by pertinent literature (Bere, 2013; Doering, Lewis, Veletsianos, & Nichols- Besel, 2008; Smit, 2012; Scornavacca, Huff, & Marshall, 2009; Wang, Woo, & Quek, 2012).

Instant messages about various subdimension combinations have not produced any convincing evidence. The subdimensions that were implemented were autonomy, dialogue, and structure. Dialogue was an interpersonal aspect, whereas structure by its very nature was an external factor to the distance learners. Finally, autonomy was an inherent characteristic. It could be more difficult and complex to influence students' perceptions of their autonomies through instant messages than it is to influence their perceptions of structure, conversation, and community. The Learning Management Systems used in online education courses could be integrated with these regular helpful instant messages. It is anticipated that they will be more useful and effective once they have been automated to the demands and condition of the learner.

The majority of the students in this study were freshmen, despite the fact that they came from a variety of disciplines. Moreover, this study only included 99 students; a larger sample size would have been beneficial for statistical analysis. Future study should, if at all possible, involve undergraduate freshmen, sophomores, juniors, and seniors as well as graduate students. Furthermore, a bigger sample size can be desirable for the study's statistical analysis and generalizability.

By developing a program that delivers regular instant messages to their distance education programs, administrators can utilize the findings of this research. These regular instant messages can be used by instructors in their online classes as well. Such automated instant messages can be included by programmers who create LMS software for distance learning programs. By establishing messaging groups among themselves and delivering comparable messages on a regular basis, distance learners can take advantage of this research.

This study explored unexplored ground in the field of distance learning. There is no precedent for regularly informing distance learners via instant messages over the course of a semester to determine how the students' perception of transactional distance is affected. It is expected that this research will serve as a model for future studies by presenting a novel technique to influence students' perceptions of transactional distance.

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### Author Information

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**Oğuz Onat**

 <https://orcid.org/0000-0002-3191-7837>


Istanbul University

Informatics Department

Turkiye

Contact e-mail: [oguzonat@ogr.iu.edu.tr](mailto:oguzonat@ogr.iu.edu.tr)

**Yasemin Bertiz**

 <https://orcid.org/0000-0001-7388-5901>

Karamanoğlu Mehmetbey University

Distance Education Application and Research Center

Turkiye