

The Portrayal of Transactional Distance Theory in Online Learning Model during Learn from Home Period at Engineering Faculty, Unnes

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Abstract. The outbreak of COVID–19 has severe impacts in various sectors including education. All schools and campuses must be cleared from any activities. However, learning process must still run for the students. Distance learning which was previously an option has now become a compulsory means of education. Engineering Faculty, Universitas Negeri Semarang also uses distance learning process. Therefore, this study is aimed at describing the implementation of distance learning. This study employed Moore’s transactional distance theory in online learning model as its theoretical framework. The data were collected from the documents and a website used for distance learning in Unnes. Then, the data were analysed qualitatively and quantitatively by using descriptive statistics. The results showed that the percentage of transactional distance between students and teacher is 83,48%, the percentage of transactional distance between students and content is 90,12%, the percentage of transactional distance between students and student is 95,492%. All of those constructs are categorized as very high.

Keywords: distance learning, e-learning, transactional distance theory

1 Introduction

The outbreak of COVID – 19 has severe impacts in various sectors including education. All schools and campuses must be cleared from any activities including classical teaching and learning process in physical classrooms. However, learning process must still be conducted for the students. Distance learning which was previously an option has now become a compulsory means of education. Because only very few universities in Indonesia have fully online classes. Most of the universities in Indonesia use online classes as substitutions under the circumstances when learning process cannot take place in a physical class. Universitas Negeri Semarang actually has an e-learning platform which accommodates distant learning process called “ELENA”. It has been underused before the pandemic of COVID – 19. However, it has been increasingly used by faculties and students of Universitas Negeri Semarang. The e-learning technology like every other forms of technology is neither good or bad in itself, how we use matters the most (Bates, A. W., & Bates, T, 2005). Therefore, this study is aimed at describing the implementation of distance learning in Engineering Faculty, Universitas Negeri Semarang.

2 Online Learning Model

Online learning is one of the forms of technology which has been widely integrated in education. Courses can be categorized as online courses if at least 80 percent of its content is delivered online (Allen & Seaman, 2013). Online learning can be considered as a part of the distance learning which employs mainly internet as its means of education. The categorization of learning process by its means of delivery is conducted by Allen & Seaman, 2013) which can be seen on this table.

| Proportion of Content Delivered Online | Type of Learning Process | Typical Characteristics |
|---|---------------------------------|--|
| 0% | Traditional | A learning process without online technology to deliver its content. It employs writing or verbal means of communication to deliver its learning contents |
| 1% - 29% | Web Facilitated | A learning process which is facilitated with a web-based technology to assist its face-to-face meeting. It may use a course management system (CMS) or web pages to post the syllabus and assignments. |
| 30% - 79% | Blended/Hybrid | A learning process which uses both online and face-to-face meeting. Most of its contents are delivered virtually, it typically employs online discussions, and typically has less significant number of face-to-face meetings. |
| 80+% | Online | A learning process whose most or all of its learning materials are delivered online. It typically does not have face-to-face meetings. |

Table 1. Online learning process categorization by Allen & Seaman, 2013

Online learning is a relatively new in learning process in higher education. However, online education programs across various disciplines has grown steadily (Allen & Seaman, 2013). One of the advantages which drives the growth of the online education is that it can help departments meet increasing demands of students' registration, and give further supports for students and faculty (Willetta, Chris Brown, Leigh Ann Danzy-Bussell, 2019). The most advantageous aspect of online learning is the flexibility and autonomy for students to take courses in terms of time and their capacity. For the campus, it can widen its students' intake as it can cover students who cannot go to campus or physical classroom.

3 Transactional Distance Theory

Moore (1973) was interested in investigating the Independent Study program which was the embryo of the distance learning today. The prominent characteristic of the Independent Study program is that the learning process occurs within distant situation in which the lecturers and the students are at separate place and time in planned learning situation (Moore, 1997). Moore (1991) argued that the degree of distance learning in a program is a relationship between three variables: dialog, structure, and learner autonomy. Moore's definition of dialog is "the interaction between the teacher and learner when one gives instruction and the other responds" (p. 3). Structure is the extent of flexibility or rigidity of the course design. Moore (1991) defined structure as "describes the extent to which an education program can accommodate or be responsive to each learner's individual needs" (p. 4). Learner autonomy concerns with the amount of autonomy that the learner has in the learning process. Moore (1991) postulated that high structure and low dialog leads to high transactional distance. As a consequence, lowering learning structure while allowing more learner autonomy decreased transactional distance and ultimately leads to high student learning autonomy. The illustration of Moore's theory on distance learning can be seen on this following figure.

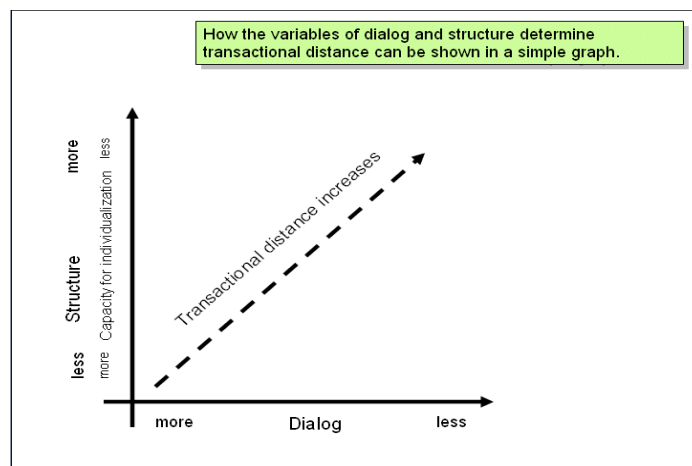


Fig 1. The relationship between dialog, structure, and learner autonomy

Moore (1989) proposed three kinds of interaction during distance learning program: inter student, student and teacher interaction, and student and learning content interaction. Many researchers have then expanded the interactions which occur during distance learning program: the teacher and student and inter student interactions (Fulford & Zhang, 1993; Sutton, 2001); interactions with the interface of a learning system (Hillman, Willis, & Gunawardena, 1994); and inter teachers interaction, teacher–content interaction and inter contents interactions (Anderson & Garrison, 1998).

4 Method

This study employed a descriptive survey design. Gay & Diehl (1992) argue that survey research methods are common methods of research that mainly uses questionnaires and interviews as instruments to collect data. Zikmund (1997) corroborated that the survey research method is one of the research techniques in which the data are collected from a number of samples in the form of people, through questions. Bailey (1982) argues that the survey research method is a research method in which the data collection technique is performed by either written or oral questions.

Descriptive survey was carried out in this study as the aim of the study is to present a picture of an online learning phenomenon. The data collection technique in this study is an online questionnaire. Statistics used to analyze data in descriptive surveys are descriptive statistics (central tendency, size of distribution, and size of correlation).

This study used revised version of Zhang’s scale of transactional distance (Zhang, 2003) by Paul., et al (2015) as the instrument to collect the data. The revised version of Zhang’s scale of transactional distance can be seen on table 2.

| No | TDST = Transactional distance between students and teacher |
|-----------|---|
| 1 | The instructor pays no attention to me |
| 2 | I receive prompt feedback from the instructor on my academic performance |
| 3 | The instructor was helpful to me |
| 4 | The instructor can be turned to when I need help in the course |
| No | TDSC = Transactional distance between student and content |
| 5 | This course emphasized SYNTHESIZING and organizing ideas, information, or experiences into new, more complex interpretations and relationships |
| 6 | This course emphasized MAKING JUDGEMENTS about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions |
| 7 | This course emphasized APPLYING theories and concepts to practical problems or in new situations |

| No | TDSS = Transactional distance between students and students |
|----|--|
| 8 | I get along well with my classmates |
| 9 | I feel valued by the class members in this online class |
| 10 | My classmates in this online class value my ideas and opinions very highly |
| 11 | My classmates respect me in this online class |
| 12 | The class members are supportive of my ability to make my own decisions |

Table 2. revised version of Zhang’s scale of transactional distance by Paul.,et al, 2015

5 – point Likert scale was used for each item of the revised revised version of Zhang’s scale of transactional distance by Paul.,et al, 2015. The questionnaire consisted of 12 items which measure three constructs of the distance learning: TDST = Transactional distance between students and teacher, TDSC = Transactional distance between student and content, and TDSS = Transactional distance between students and students. The population of this study consisted 131 students of Civil Engineering Educational Department; Engineering Faculty; Universitas Negeri Semarang who underwent online courses due to the outbreak of COVID – 19. 70 students were involved as samples of this study. The data were analysed by using a descriptive statistic to show the percentage of the students’ response to each item by using SPSS version 22.

5 Result of the study

Transactional distance between students and teacher

The results of the Transactional distance between students and teacher variable can be seen on this table 3,4,5, and 6

| Statistics | | | | | | | | | |
|---|---------|----|---------|------------|--------|------|-----------|----------|-------|
| Q1 The instructor pays no attention to me | | | | | | | | | |
| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | of Mean | | | | Deviation | | |
| | | | 2.2286 | .11895 | 2.0000 | 2.00 | .99523 | .990 | 4.00 |

Table 3. The results of 1st item of the TDST

Table 3 shows the results of the 1st item on the TDST. The mean of the data = 2.2286, with S.E of mean = 0.11895, Median = 2.000, Mode = 2.00, SD=0.99523, variance = 0.990, and range = 4.00. Based on the mean value of score, 55,715% students agree that the instructor pays attention to themselves during the online course.

| Statistics | | | | | | | | | |
|--|---------|----|--------|------------|--------|------|-----------|----------|-------|
| Q2: I receive prompt feedback from the instructor on my academic performance | | | | | | | | | |
| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.6143 | .11741 | 4.0000 | 4.00 | .98235 | .965 | 4.00 |

Table 4. The results of 2nd item of the TDST

Table 4 shows the results of the 2nd item on the TDST. The mean of the data = 3.6143, with S.E of mean = 0.11741, Median = 2.000, Mode = 4.00, SD=0.98235, variance = 0.965, and range = 4.00. Based on the mean value of score, 90,3575% students agree that the instructor provide prompt feedback on the students' academic performance.

| Statistics | | | | | | | | | |
|--------------------------------------|---------|----|--------|----------|--------|------|-----------|----------|-------|
| Q3: The instructor was helpful to me | | | | | | | | | |
| N | Valid | 70 | Mean | Std. | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | | Error of | | | Deviation | | |
| | | | | Mean | | | | | |
| | | | 3.8429 | .11976 | 4.0000 | 4.00 | 1.00196 | 1.004 | 4.00 |

Table 5. The results of 3rd item of the TDST

Table 5 shows the results of the 3rd item on the TDST. The mean of the data = 3.8429, with S.E of mean = 0.11976, Median = 4.000, Mode = 4.00, SD=1.00196, variance = 1.004, and range = 4.00. Based on the mean value of score, 96,0725% students agree that the instructor was helpful during the online course.

| Statistics | | | | | | | | | |
|--|---------|----|--------|------------|--------|------|-----------|----------|-------|
| Q4: The instructor can be turned to when I need help in the course | | | | | | | | | |
| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.6714 | .11991 | 4.0000 | 4.00 | 1.00320 | 1.006 | 4.00 |

Table 6. The results of 4th item of the TDST

Table 6 shows the results of the 4th item on the TDST. The mean of the data = 3.6714, with S.E of mean = .11991, Median = 4.000, Mode = 4.00, SD=1.00320, variance = 1.006, and range = 4.00. Based on the mean value of score, 91,785% students agree that the instructor provided necessary assistance for the students who need help during the online course.

Transactional distance between students and content

The results of the Transactional distance between students and content variable can be seen on this table 7,8, and 9.

Statistics

Q5 This course emphasized SYNTHESIZING and organizing ideas, information, or experiences into new, more complex interpretations and relationships

| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
|---|---------|----|--------|------------|--------|------|-----------|----------|-------|
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.6000 | .10455 | 4.0000 | 3.00 | .87477 | .765 | 4.00 |

Table 7. The results of 1st item of the TDSC

Table 7 shows the results of the 1st item on the TDSC. The mean of the data = 3.6000, with S.E of mean = .10455, Median = 4.000, Mode = 4.00, SD=.87477, variance = .765, and range = 4.00. Based on the mean value of score, 90,00% students agree that this course emphasized synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships.

Statistics

Q6 This course emphasized MAKING JUDGEMENTS about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions

| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
|---|---------|----|--------|------------|--------|------|-----------|----------|-------|
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.5857 | .10274 | 4.0000 | 4.00 | .85961 | .739 | 4.00 |

Table 8. The results of 2nd item of the TDSC

Table 8 shows the results of the 2nd item on the TDSC. The mean of the data = 3.5857, with S.E of mean = .10274, Median = 4.000, Mode = 4.00, SD= .85961, variance = .765, and range = 4.00. Based on the mean value of score, 89,6425% students agree that this course emphasized making judgements about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions.

Statistics

Q7 This course emphasized APPLYING theories and concepts to practical problems or in new situations

| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
|---|---------|----|--------|------------|--------|------|-----------|----------|-------|
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.6286 | .11361 | 4.0000 | 4.00 | .95054 | .904 | 4.00 |

Table 9. The results of 3rd item of the TDSC

Table 7 shows the results of the 2nd item on the TDSC. The mean of the data = 3.6286, with S.E of mean = .11361, Median = 4.000, Mode = 4.00, SD= .95054, variance = .904, and range

= 4.00. Based on the mean value of score, 90,715% students agree that this course emphasized applying theories and concepts to practical problems or in new situations.

Transactional distance between students and students

The results of the Transactional distance between students and content variable can be seen on this table 9,10, 11, 12, and 13

| Statistics | | | | | | | | | |
|--|---------|----|---------|------------|--------|------|-----------|----------|-------|
| Q8 I get along well with my classmates | | | | | | | | | |
| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | of Mean | | | | Deviation | | |
| | | | 3.6143 | .13695 | 4.0000 | 4.00 | 1.14579 | 1.313 | 4.00 |

Table 9. The results of 1st item of the TDSS

Table 9 shows the results of the 1st item on the TDSS. The mean of the data = 3.6143, with S.E of mean = .13695, Median = 4.000, Mode = 4.00, SD= 1.14579, variance = 1.313, and range = 4.00. Based on the mean value of score, 90,325% students agree that they can get along well with my classmates.

| Statistics | | | | | | | | | |
|--|---------|----|---------|------------|--------|------|-----------|----------|-------|
| Q9 I feel valued by the class members in this online class | | | | | | | | | |
| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | of Mean | | | | Deviation | | |
| | | | 3.8000 | .11619 | 4.0000 | 4.00 | .97207 | .945 | 4.00 |

Table 10. The results of 2nd item of the TDSS

Table 10 shows the results of the 2nd item on the TDSS. The mean of the data = 3.8000, with S.E of mean = .11619, Median = 4.000, Mode = 4.00, SD= .97207, variance = .945, and range = 4.00. Based on the mean value of score, 95 % students agree that they feel valued by the class members in this online class.

| Statistics | | | | | | | | | |
|--|---------|----|---------|------------|--------|------|-----------|----------|-------|
| Q10 My classmates in this online class value my ideas and opinions very highly | | | | | | | | | |
| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
| | Missing | 0 | of Mean | | | | Deviation | | |
| | | | 3.9286 | .11205 | 4.0000 | 4.00 | .93749 | .879 | 4.00 |

Table 11. The results of 3rd item of the TDSS

Table 11 shows the results of the 3rd item on the TDSS. The mean of the data = 3.9286, with S.E of mean = .11205, Median = 4.000, Mode = 4.00, SD= .93749, variance = .945, and range = 4.00. Based on the mean value of score, 98,215 % students agree that they feel valued by the class members in this online class

Statistics

Q11 My classmates respect me in this online class

| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
|---|---------|----|--------|------------|--------|------|-----------|----------|-------|
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.9000 | .11357 | 4.0000 | 4.00 | .95021 | .903 | 4.00 |

Table 12. The results of 4th item of the TDSS

Table 11 shows the results of the 4th item on the TDSS. The mean of the data = 3.9000, with S.E of mean = .11357, Median = 4.000, Mode = 4.00, SD= .95021, variance = .903, and range = 4.00. Based on the mean value of score, 97,5 % students agree that classmates respect them in this online class

Statistics

Q12 The class members are supportive of my ability to make my own decisions

| N | Valid | 70 | Mean | Std. Error | Median | Mode | Std. | Variance | Range |
|---|---------|----|--------|------------|--------|------|-----------|----------|-------|
| | Missing | 0 | | of Mean | | | Deviation | | |
| | | | 3.8571 | .11562 | 4.0000 | 4.00 | .96738 | .936 | 4.00 |

Table 13. The results of 5th item of the TDSS

Table 13 shows the results of the 5th item on the TDSS. The mean of the data = 3.8571, with S.E of mean = .11562, Median = 4.000, Mode = 4.00, SD= .96738, variance = .936, and range = 4.00. Based on the mean value of score, 96,42 % students agree that their classmates are supportive of their ability to make their own decisions.

6 Conclusion

Several conclusions which can be withdrawn based on the results of the data analysis in this study are as follows: 1) On the construct of transactional distance between students and teacher, based on the mean value of the score, 55,715% students agree that the instructor pays attention to themselves during the online course; 90,3575% students agree that the instructor provide prompt feedback on the students' academic performance; 96,0725% students agree that the instructor was helpful during the online course; 91,785% students agree that the instructor provided necessary assistance for the students who need help during the online course; 2) On the construct of transactional distance between students and content, based on the mean value of the score, 90,00% students agree that this course emphasized synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships;

89,6425% students agree that this course emphasized making judgements about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions; 90,715% students agree that this course emphasized applying theories and concepts to practical problems or in new situations; 3) On the construct of transactional distance between students and students, based on the mean value of the score, 90,325% students agree that they can get along well with my classmates; 95 % students agree that they feel valued by the class members in this online class; 98,215 % students agree that they feel valued by the class members in this online class; 97,5 % students agree that classmates respect them in this online class; 96,42 % students agree that their classmates are supportive of their ability to make their own decisions.

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