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The Mediating Role of Transactional Distance on the Relationship between Course Satisfaction and Student Persistence

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ABSTRACT

In the context of education, which is asynchronous and synchronous online learning, students' persistence is of concern in most educational institutions. Several studies reveal many factors that influence students' persistence. One of them is course satisfaction but hardly any research about the effect of psychological space of learners on students' persistence. Thus, this study aimed to determine the mediating effect of transactional distance on the relationship between course satisfaction and student persistence. The study employed a descriptive-causal method of research and used an adaptive questionnaire that was contextualized by the researchers, and was participated by 239 senior high school students (grade 11 and grade 12) at the University of Mindanao Digos College; utilized stratified random sampling. The results of the study showed that the students are satisfied with their online course experience and thus students are highly likely to persist. Results also reveal that the transactional distance is low. Moreover, it also showed course satisfaction and student persistence are significantly related. However, after the insertion of transactional distance, the direct path unveiled insignificance while the indirect path revealed significant effect. Hence, the mediation analysis disclosed that transactional distance fully mediates the relationship between course satisfaction and student persistence. The paper provides evidence that in asynchronous and synchronous online learning, satisfaction should not solely be the focus in attaining students' "intent-to-persist" but must also consider the perceived transactional distance of learners.

INTRODUCTION

Inevitably, when the topic is all about transactional distance, the gist is distance education, which is the state of our education today - asynchronous and synchronous online distance learning, where concerns are very apparent. Several studies have identified variables affecting dropout rates in online and distance learning (Kauffman, 2015; Croxton, 2014; Adamopoulos, 2013; Park & Choi, 2009; Willging & Johnson, 2009; Selim, 2007). Nevertheless, it has been shown time and time again that one very intuitive and straightforward variable, satisfaction, is positively correlated with persistence in online distance learning (Lee & Choi, 2013; Joo *et al.*, 2013; Joo *et al.*, 2011; Schreiner, 2009; Park & Choi, 2009; Levy, 2007).

According to some experts, the attrition rate for online learning could be as high as 75% (Croxton, 2014). This was particularly prominent in Massive Open Online Courses (MOOCs) where completion of the course could be as poor as 6.5 percent (Jordan, 2014). Carr (2000) argues that the persistence rate is often 10-20% lower in distance education programs than in traditional settings. Moreover, Rutter (2016) states that students' persistence with online courses is lesser than the normal face-to-face classes. From the report of Gabriel Lalu in Inquirer.net as of June 18, 2020, according to Samahan ng Progresibong Kabataan (Spark), after the Department of Education (DepEd) opened its online enrollment procedures in early June, only 10.5 million of the 27.2

million students in the primary and secondary education systems have enrolled.

Conversely, the study of Markle (2015) stated that course satisfaction is not only the predictor of students' persistence but must also consider the psychological distance. Transactional distance values are unique student satisfaction indicators, which reflect learning and persistence (Paul *et al.*, 2015). Transactional distance influences students' satisfaction and persistence, and it is viewed as a significant matter of conversation (Steinman, 2007). Transactional distance is the perceived psychological and cognitive distance between students and educators; the higher the transactional distance the higher the autonomy of learners (Moore, 1993). Now, according to Oregon, McCoy, and Carmon-Johnson (2018), this learners' autonomy or lack of interactivity has been one of the reasons for persistence degradation. Since a correlation has been identified between highly satisfied students and persistence in a program (Horzum, 2015), examining transactional distance and improvements that enhance student satisfaction in an online classroom will bring apparent advantages for students' persistence. Hence, from strong empirical grounds, transactional distance might contribute to the relationship between course satisfaction and student persistence. In this new normal, asynchronous and synchronous online distance learning dominate, and we researchers have been inspired to discover the mediating role of transactional distance

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on the relationship between course satisfaction and student persistence that has not yet been discovered by recent studies. We aimed to discover how mediating variable specifies the association that occurs between independent and dependent variables, that will eventually contribute to our education, on how psychological distance affects learners consequently formulating certain actions addressing attrition.

This study is deeply anchored with Michael Moore's (1972) Transactional Distance Theory. The transaction occurs in distance education in a setting consisting of students and teachers separated by a geographical distance from each other resulting in an effect on their satisfaction and persistence in education. A psychological and communication space exists because of this separation (Moore, 1972). Moore further pointed out that possible misunderstandings caused by the transactional distance between the learning environment and the learner may occur even in-room setting, which also influences students' satisfaction and intent to persist (Moore, 1993). Psychological and contact space is referred to as transactional distance by Moore. Moore coined the term and developed the basic principle of transactional distance (Moore, 1972). The Moore model involves an interrelated set of variables: dialogue, structure, and autonomy of learners (Moore, 1972). The use of 'dialogue' connotes experiences with constructive characteristics. The dialog can be called purposeful, positive interactions that are respected by all parties in a relationship. Moore states in particular that "the nature of the medium of communication directly affects the extent and quality of dialogue between teachers and learners" (Hills & Keegan, 1994). A Learning Management System (LMS) framework also determines the means of communication leveraged for an online course.

In an online course, the structure is a qualitative variable, as is dialogue, which is primarily dependent on the communication media being used throughout the course. The greater the structure and the lower the dialogue, the greater the distance between teachers and learners from the transaction (Moore, 1972). The last variable considered by Moore was the learner's autonomy. The theory of Moore effectively combined two different pedagogical traditions: the humanistic tradition and the tradition of behavior (Moore, 1972). While humanism gave value to interpersonal, unstructured dialogue from the field of counseling, a systematic design of instruction gave more value to the behaviorist tradition (Moore, 1972). Such systematic teaching was underpinned by behavioral goals controlled almost entirely by the teacher. He questioned the de facto behaviorist model of education in the early 1970s by incorporating learner autonomy as a central variable of his model (Hills & Keegan, 1994). At a time before the emergence of the Internet (or even widespread use of personal computers), Moore's theory was developed and as such, required improvements that accounted for the shift in learning and communication provided new technologies.

This study sought to determine the mediating role of transactional distance on the relationship between course satisfaction and student persistence. Specifically, this research aimed to examine the following:

- (1) Determine the level of course satisfaction with the learning experiences of senior high school students;
- (2) Determine the level of student persistence in terms of academic Integration, social Integration, supportive services Satisfaction, degree commitment, institutional commitment; and academic conscientiousness;
- (3) Determine the level of perceived Transactional Distance in terms of transactional distance between students and content, transactional distance between students and teacher, and transactional distance between students and technology;
- (4) Determine if there is any significant relationship between course satisfaction and student persistence; and determine if transactional distance significantly mediate the relationship between course satisfaction and student persistence.

METHODOLOGY

The researchers employed quantitative research: descriptive causal design. According to Jefferys (2021), descriptive and causal research addresses various questions. Descriptive studies are mainly designed to clarify what is happening or what is existing. On the other hand, causal research is used to determine if the importance of other variables is caused or affected by one or more variables. Descriptive research aims to describe a population, situation, or phenomenon in an accurate and systematic way (Languita *et al.*, 2023). And was utilized to describe the respondents' level of perceived course satisfaction, student persistence, and transactional distance. On the other hand, causal research is concerned with measuring and testing the indirect effect, as a function of the mediator, on the dependent variable; a mediator is a variable that influences the relationship between an outcome and a predictor. In this study, causal design is utilized by the researchers to determine how transactional distance influenced the relationship between course satisfaction and student persistence through the lens of senior high school students. The participants of this study are Senior High School (SHS) students at UM Digos College. These are students, Grade 11 and Grade 12 students who were officially enrolled in the school year 2020-2021.

To quantify the level of course satisfaction, student persistence, and transactional distance, the researchers adapted questionnaires from different authors where contents were validated by experts. It contains three parts: the first part determines the course satisfaction, the second part is student persistence, and the last part is for transactional distance. For the independent variable, the statements of the questionnaire were from the "Development of Online Course Satisfaction Scale" of Bayrak, Fatma, Tibi, Moanes, Altun, and Arif (2020).

Moreover, the instruments for measuring students' Course Satisfaction is a Five-point Likert scale format in which respondents will select the most appropriate answer from response options ranging from (5) Strongly agree, (4) Agree, (3) Neutral, (2) Disagree, and (1) Strongly disagree.

For the dependent variable, some statements of the questionnaire from "The College Persistence Questionnaire: Development and Validation of an Instrument That Predicts Student Attrition" adapted from Davidson, Beck, and Milligan, (2009) were modified (from "college" to "senior high school"; the statements were changed to declarative form). Furthermore, the instrument for measuring Student Persistence is a Five-point Likert scale in a "favorability scale" format in which respondents will select the most appropriate answer from response options ranging from (5) Very favorable, (4) Somewhat favorable, (3) Neutral, (2) Somewhat unfavorable, and (1) Very unfavorable.

Lastly, for the mediating variable, the questionnaire from "Technology Matters - The Impact of Transactional Distance on Satisfaction in Online Learning" adapted from Weidlich and Bastiaens (2018) was also modified (from "Moodle" changed to "Quipper"; items in "satisfaction with the learning experience" were removed). Additionally, the instrument of Transactional Distance is a 5-point Likert scale format which respondents will select the most appropriate answer from response options ranging from (5) Strongly disagree, (4) Disagree, (3) Neutral, (2) Agree, and (1) Strongly agree.

To obtain a result that is valid and reliable, the following statistical tools were being used. All interpretation was based on the 0.05 level of significance. Mean. This is utilized to get the average perception of respondents for each variable of the study (Alegado *et al.* 2024; Zalsos & Corpuz, 2024). In addition, this is utilized to describe the level of the respondents' course satisfaction, the level of student persistence in terms of academic integration, social integration, supportive services satisfaction, degree commitment, institutional commitment, and academic conscientiousness, and the level of perceived transactional distance in terms of transactional distance between students and content, the transactional distance between students, the transactional distance between students and teacher, and the transactional distance between students and technology. *Pearson r*. This determines the significant relationship between the variables (Diquito *et al.*, 2024). and *Structural Equations Modeling (SEM)*. This is utilized to determine the mediating effect of transactional distance on the relationship between course satisfaction and student persistence.

RESULTS AND DISCUSSION

Level of Course Satisfaction among SHS Students

Table 1 presents the overall level of Course satisfaction of senior high school students. As disclosed in the table, respondents obtained a mean rating of high course satisfaction (\bar{x} = 3.80, SD = 0.54). This means that the

students are satisfied. Bage (2018) and Diez . (2021) stated that students are highly satisfied when the online courses have clear structures, interactive instructors, healthy and supportive learning environmentt al. (2021) stated that students are highly satisfied when online courses have clear structures, interactive instructors, and healthy and supportive learning environments. This is congruent to the study of Cole, Shelley, & Swartz (2014), who surveyed a total of 553 cases and found that the significant reason why students are highly satisfied with online learning is convenience, and the main reason for dissatisfaction is the lack of learner-teacher and learner-learner interactions. Apparently, even in the state of asynchronous and synchronous online distance learning, students are still satisfied because of the timely update of their instructors, the accommodating ambiance provided by the educational institution, fast-paced interactivity with peers, and the simplicity and flexibility of the learning interface.

Also, because of the convenience experienced by students where they can participate in the class anywhere they want and answer the tasks anytime. The three domains of transactional distance (student-content, student-student, and student-teacher) were found to have a significant relationship with students' perceived satisfaction that the three predictors accounted for 31.6 percent of the variance in student satisfaction (Mbwesa, 2014). This implies that students who experienced portability and great interaction with his/ her peers and teacher are highly satisfied with their online learning environment. Furthermore, Bolliger and Halupa (2012) cited by Yalcin (2017) stated that course satisfaction and technological anxiety have a negative relationship; their anxiety in using technology is because of incompetence in using the tool. Students who have low levels of technological anxiety have significantly higher satisfaction than those students with high technological anxiety (Yalcin, 2017). This implies that if students are more likely used to utilizing the technology there are probably satisfied in the online learning context.

Table 1: Level of Course Satisfaction with the Learning Experiences of SHS Students in UMDC (n=239)

Course Satisfaction	Mean	SD
Overall Mean	3.8	0.54

Level of Student Persistence among SHS Students

Table 2 shows the level of Student Persistence among senior high school students. As disclosed in the table, respondents obtained a mean rating of high student persistence (\bar{x} = 3.66, SD = 0.44) which was verbally described as high. This means that the students are likely to persist even in a state of asynchronous and synchronous online distance learning. The result of this study is very contrary to the study of Sorensen and Donovan (2017) which they stated that, unlike traditional education, online courses in an educational institution resulted in lower persistence rates.

Academic Integration

An indicator of student persistence got the mean rating of 3.58 (SD=0.44) which was verbally described as high. This implies that the senior high school students in UMDC will likely persist because of their academic connection. As stated by Woosley and Shepler (2011) cited by Toliao (2017) that according to many studies academic integration is as important as social integration, and it is key for the academic performance of underprepared students, boosting their chances of persistence and degree completion.

Social Integration

An indicator of student persistence got the mean rating of 3.71 (SD=0.62) which was verbally described as high. This implies that the senior high school students in UMDC will likely persist because of their commendable social camaraderie in the online learning environment. According to Inkelas, Daver, Vogt, and Leonard (2007) cited by Glenn (2017) that peer participation is another form of social integration that benefits first-generation college students; students are encouraged to join student groups, which also gives them a greater sense of campus belonging and decreases feelings of isolation, thus instilling a sense of connection to the school that promotes retention and persistence.

Table 2: Level of Student Persistence of SHS of Students in UMDC (n=239)

Indicators	Mean	SD
Academic Integration	3.58	0.44
Social Integration	3.71	0.62
Supportive Services Satisfaction	3.84	0.63
Degree Commitment	4.17	0.73
Institutional Commitment	3.81	0.68
Academic Conscientiousness	2.84	0.97
Overall	3.66	0.44

Supportive Services Satisfaction

An indicator of student persistence got the mean rating of 3.84 (SD=0.63) which was verbally described as high. This implies that the senior high school students in UMDC will likely persist because they perceived commendable satisfaction in the support of the school in services. Such supportive services will affect student retention and the overall evaluation of an academic institution (Jones (2011) cited by Emmanuel-Frenel, 2017). Additionally, Culp (2014) stated that universities

are having a hard time increasing students' satisfaction so that students' persistence as well is apparent, this can only be attained if there exists quality student support.

Degree Commitment

An indicator of student persistence got the mean rating of 4.17 (SD=0.73) which was verbally described as high. This implies that the senior high school students in UMDC will likely persist to finish their strand. Since there is a connection between high levels of satisfaction and persistence in a degree program (Weidlich and Bastiaens, 2018), exploring changes to the online classroom that increase student satisfaction will benefit students, teachers, and the institutions they attend. Students must have the mindset of completing their degree so that persistence will follow (Holzweiss, Joyner, Fuller, Henderson, & Young (2014) cited by Sweetland, 2015).

Institutional Commitment

An indicator of student persistence got the mean rating of 3.81 (SD=0.68) which was verbally described as high. This implies that the senior high school students in UMDC are likely to persist in their commitment to the institution. According to Lucey (2018), a higher level of commitment in institutions than in typical classrooms in online learning. It implies that online learning is critical to their institutions' success, while also expressing concern that online learners are less likely to succeed and persist in an academic institution (Dexter, 2015).

Academic Conscientiousness

An indicator of student persistence got the mean rating of 2.84 (SD=0.97) which was verbally described as moderate. This implies that the senior high school students in UMDC are moderately eager to thoroughly do well in academics. Brown (2015) claims that there is a connection between academic conscientiousness and college persistence. In contrast, the research Gregg (2021) found that conscientiousness has no statistically significant relationship with organizational engagement or help and satisfaction.

Level of Transactional Distance among SHS Students

Table 3 shows the level of the perceived Transactional Distance among senior high school students in UMDC. As disclosed in the table, respondents obtained a mean rating of low transactional distance (\bar{x} = 3.78, SD= 0.48). This means that the students perceived low transactional distance.

Table 3: Level of Perceived Transactional Distance of SHS Students in UMDC (n=239)

	TDSC	TDSS	TDST	TDSTECH	Overall Mean
Mean	3.91	3.81	3.64	3.75	3.78
SD	0.59	0.67	0.57	0.53	0.48

Transactional Distance between Students and Content (TDSC)

An indicator of transactional distance got the mean rating of 3.91 (SD=0.59) which was verbally described as low. This implies that senior high school students in UMDC are more engaged with the online learning content. According to Chou, Peng, and Chang (2010) cited by Alotibi (2018) found out that in Learning Management Systems, learner-content interaction has the lowest percentage in an online learning interactive function. Moreover, Huang, Chandra, DePaolo, Cribbs, and Simmons (2015) stated that learner and content interaction is closely related to learner and interface interaction that the flexibility of LMS's contributes to the connection of the learners and the contents.

Transactional Distance between Students (TDSS)

An indicator of transactional distance got the mean rating of 3.81 (SD=0.67) which was verbally described as low. This implies that the senior high school students in UMDC have great connections and interactions with each other. As the study of Ali (2018) stated that in an online learning environment, there are numerous advantages to students' quality of interactions with other students, for example, the student acquires knowledge through collaborative inquiry with other students. Students' motivation and participation, perceived learning, course and instructor satisfaction, and retention in online courses have all been shown to be impacted by the social presence of students with each other (Richardson, Besser, Koehler, Lim, & Strait, 2016).

Transactional Distance between Students and Teacher

An indicator of transactional distance got the mean rating of 3.64 (SD=0.57) which was verbally described as low. This implies that the senior high school students in UMDC perceived low psychological space between them

and their teachers in the online learning environment. According to Hollis (2016), student-faculty interactions are widely acknowledged to have a positive impact on students' cognitive advancement, satisfaction, and development of educational institutions. In the result findings of Ali (2018) and Acuña (2021) stated that for students in online courses, there is a moderate to a strong positive relationship between student-faculty interaction and student satisfaction. Increases in student-faculty interaction were moderate to strongly correlated with increases in student satisfaction for students in online courses, according to his findings. This is contrary to the findings of Peterson (2019) which resulted in TDST (transactional distance between students and teacher) as insignificant with a p-value of 0.521.

Transactional Distance between Students and Technology

An indicator of transactional distance got the mean rating of 3.75 (SD=0.53) which was verbally described as low. This implies the senior high school students in UMDC are very connected and engaged to the LMS's specifically to the 'Quipper', they perceived low transactional distance in utilizing such interface. As stated by Horzum (2015) that testing the effects of technology (interface) will significantly affect transactional distance and online course satisfaction of students. Additionally, literacy of the interface used in online learning will help in minimizing the high attrition rate and level of isolation of learners (Burns & Gillepie, 2018; Keefer, 2015).

Significant Relationship between Course Satisfaction and Student Persistence

Table 4 shows the correlation analysis between Course Satisfaction and Student Persistence of senior high school in UMDC. It was revealed that there is statistical evidence showing a significant relationship between two variables with a p-value of 0.001 and a beta coefficient of 0.05.

Table 4: Direct effects of Course Satisfaction to Student Persistence

	Unstandardized	Standard Error	Standardized	t	p
CS to SP	0.05	0.05	0.06	1.07	< .001

CS for course satisfaction, SP for Students Persistence

This implies that a unit increase in Course Satisfaction there is a 0.05 increase in Student Persistence. The result is similar to the study of Lim and Kim (2013) cited by Weidlich and Bastiaens (2018). Moreover, Mbwesa (2014) studied the relationship between transactional distance and students' satisfaction and stated student-content, student-student, student-teacher transactional distance were investigated as predictors of perceived learner satisfaction. However, Richardson, Besser, Koehler, Lim, & Strait (2016) argued that the amount of social presence mediates student satisfaction and persistence. Social presence, defined as the ability to perceive others in an online environment and the degree of emotional and social engagement, has been

shown to influence course and instructor satisfaction, and online course persistence (Gutierrez-Santiuste, Rodriguez-Sabiote, & Gallego-Arrufat, 2015).

Additionally, Markle (2015) also stated that course satisfaction is not only the predictor of students' persistence in an online learning environment. This implies that even some authors suggest a significant relationship, but many authors as well stated inconsistencies and must take into consideration of the social and emotional presence in learning context (Mehri & Izadpanah, 2017; Poquet, Kovanović, de Vries, Hennis, Joksimović, Gašević, & Dawson, 2018) which is related to the theory of transactional presence (Shin, 2003).

Mediation Analysis Including Change in SHS Students’ Perceived Student Persistence from Course Satisfaction, and Taking Their Perceived Transactional Distance as a Mediator Variable

The table shows the path coefficient among course satisfaction, student persistence, and transactional distance. The path coefficient of the total effect is 0.42. The direct effect is 0.05 which is the impact of course satisfaction to student persistence. This is similar to the study of

Dhungana (2015) that satisfaction with e-learning is a predictive indicator for learners intending to continue learning online (persistence). Further, the indirect effect is 0.37 which is the impact of course satisfaction to student persistence when bridged or mediated by transactional distance. Increased student satisfaction is linked to student engagement in online courses (Martin & Bolliger, 2018), and students who are engaged in the learning environment are more persistent (Ali & Smith, 2015).

Table 5: Results from the mediation analysis including change in perceived students’ persistence from course satisfaction, and transactional distance as a mediator variable

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Direct Effects	0.05	0.05	1.08	0.28	-0.04	0.14
Indirect Effects	0.37	0.04	8.98	< .001	0.29	0.46
Total Effects	0.42	0.05	9.28	< .001	0.34	0.51

It was disclosed the test of transactional distance as a mediator to the relationship between course satisfaction and student persistence. Previous table showed the significant relationship between course satisfaction and student persistence ($p=0.001$), however, after the insertion of the transactional distance it revealed: the direct path showed a positive effect result but not significant ($p=0.28$); the indirect path of the mediation analysis showed significance with a p-value of 0.001. Hence, transactional distance fully mediates the relationship between course satisfaction and student persistence. This implies that student persistence could only be influenced by course satisfaction if there exist transactional distance in between, that in an online educational realm, course

satisfaction should not solely be the consideration in attaining the “intent-to-persist” of students. But the emphasis on transactional distance plays a critical role in linking the two variables.

This conforms to the argument of Peterson (2019) that the focus on transactional distance will improve the level of students’ satisfaction and persistence. Which is according to Moore (1993), transactional distance influences the process and results of teaching namely satisfaction and persistence (Weidlich and Bastiaens, 2018). Conversely, since social presence is related to transactional distance (Horzum, 2015), the findings of Pattison (2017) revealed no significant bivariate relationship between social presence and students’ satisfaction and persistence.

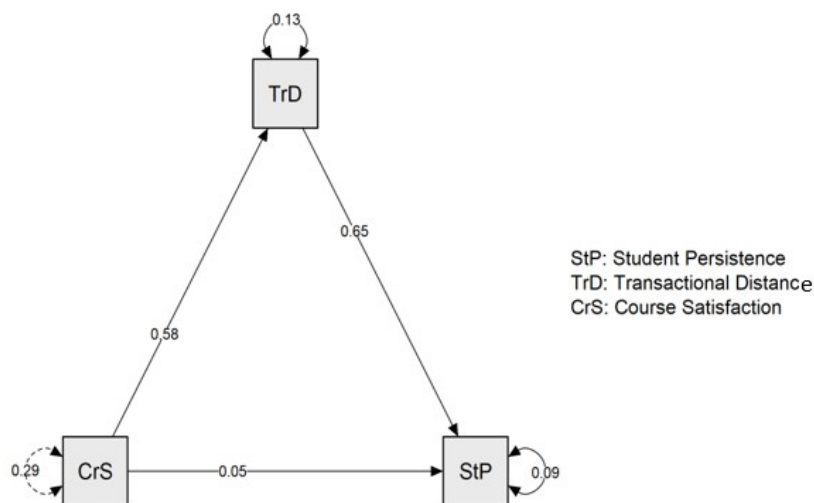


Figure 1: Mediating effect model of Transactional Distance between the Relationship of Course Satisfaction and Student

CONCLUSION

Based on the aforementioned findings, the researchers concluded that the senior high school students at UM Digos College are satisfied, likely to persist, and perceive

low transactional distance. Furthermore, the result of the study of The Mediating Role of Transactional Distance on the Relationship between Course Satisfaction and Student Persistence indicates the following: Course satisfaction has

a significant relationship with student persistence. However, after the insertion of the mediator (transactional distance), the direct effect is not significant. Meanwhile, the indirect path showed significant results; hence, full mediation of transactional distance on the relationship between course satisfaction and student persistence is evident.

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