

The Relationship of Padlet in Collaborative Learning to LMS Satisfaction in Student-Centered Learning

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Abstract

The use of LMS after the pandemic has changed students' learning styles. Of course, this change will lead to satisfaction and a desire to use LMS again in the future. One factor that can influence this is the implementation of collaborative learning in the use of LMS. This study uses Padlet, an LMS application, to stimulate collaborative learning among students and examine its relationship with user satisfaction. The respondents in this study were psychology students enrolled in a quantitative research psychology course, for a total of 43 individuals. The instruments used to measure collaboration in this study were the Student Perception of Padlet instrument (11 items), and student satisfaction with the LMS was measured using the perceived satisfaction dimension of the e-learning experience (5 items). The results showed a relationship between the implementation of collaborative learning and user satisfaction with the LMS.

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INTRODUCTION

The Industrial Revolution, at every level, not only changes the way we produce goods but also reshapes society, the economy, and, of course, the education system. The Industrial Revolution 4.0 is bringing changes to many social aspects of society. The changes are not even caught up with by those living in the present, so the current era is also known as the era of disruption (Muliawaty, 2019). One of the changes and shifts from old-fashioned teacher-centered learning methods to learner-centered learning, especially in this context, is that it applies to students in higher education.

Student-centered learning provides learners with the opportunity to choose the learning style that best suits them, a choice that may not have been available to those in previous generations. Choices are even facilitated so that learners undergo an educational process more tailored to their character (personalized learning). The purpose of education has also shifted from a single discipline or intradisciplinary to a multidisciplinary, interdisciplinary, and even transdisciplinary endeavor, with the freedom it affords facilitating learners in these domains. This is in line with Undang-Undang Nomor 12 Tahun 2012 Tentang Pendidikan Tinggi (2012) which aims to: 1) develop abilities and shape the character and civilization of a dignified nation in order to educate the nation; 2) develop innovative, responsive, creative, skilled, competitive, and cooperative academicians through the implementation of tridharma; and 3) develop science and technology by paying attention to and applying humanities values. Therefore, to achieve this, the widespread use of information technology in collaboration is crucial. The value of collaboration in higher education is one of the Graduate Learning Outcomes (GLOs), making it a crucial aspect of learning.

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Nowadays, collaborative learning is widely implemented in the learning process. This is because cooperation between students can yield better outcomes than independent learning (Nokes-Malach et al., 2015). Collaborative learning is a method that focuses on cooperation among students and is characterized by agreement (Partiwi, 2023). The lecturer's role is limited to assigning tasks; students form groups, identify problems, conduct group discussions, and present their results independently. O'Donnell and Hmelo-Silver (2013) explain that collaborative learning has several characteristics: 1) positive dependence among others; 2) interaction; 3) accountability for work results at individual and group levels; 4) development of interpersonal skills in cooperation and responsibility; 5) heterogeneous groups with different abilities; 6) sharing information between peers and with lecturers; 7) sharing authority between lecturers and students; and 8) the role of lecturers is only as mediators of discussions. Thus, it is expected that students will be able to cooperate, tolerate, depend on, and motivate one another, thereby developing leaders who naturally emerge from each group. However, like other learning models, this model also has several problems.

One problem is the close association between collaborative and cooperative learning; the difference lies in how tasks are divided (Partiwi, 2023). In collaborative learning, each person complements the others' contributions, but in cooperative learning, each person tries to make their material the best. Second, independence in organizing roles in the group is more flexible in collaborative learning. Thirdly, the discussion in collaborative learning is freer, allowing students to choose a problem that suits their interests and their team's agreement.

Various studies have shown that Padlet can support student interaction and engagement in learning (Dewitt et al., 2015). These studies have focused on the perceived use of Padlet in general or as a stand-alone online discussion tool. Previous studies rarely examine the role of Padlet as a collaborative learning support tool directly integrated into the Learning Management System (LMS). In addition, the relationship between the level of collaboration facilitated by Padlet and student satisfaction with the LMS has received relatively little empirical attention, especially in the context of student-centered learning and research-methodology-based courses that demand high accountability for the learning process. Thus, there remains a research gap regarding how Padlet functions not only as a medium of interaction but also as a pedagogical mechanism that simultaneously strengthens collaborative learning and increases satisfaction with LMS use.

Given this gap, this study aims to contribute by empirically examining the relationship between Padlet-facilitated collaborative learning and students' satisfaction with LMS use. Unlike previous research, this study positions Padlet within the LMS ecosystem in the context of collaborative learning in Quantitative Psychology Research courses. The results of this study are expected to enrich the literature on integrating collaborative learning technology into the LMS and to provide practical implications for lecturers and higher education managers in designing collaborative, controlled, and student-satisfaction-oriented learning experiences.

The inconsistency of individual learning outcomes in the collaborative process, the flexibility offered, and the flexibility in the student learning process pose their own challenges, ensuring that student work in the course still meets the Graduate Learning Outcomes (LLOs). So there needs to be an effort to control the student learning process. Here, the role of Padlet becomes crucial. Padlet is a digital platform that allows individuals to discuss, interact, and even evaluate student abilities, whether from lecturers to students or fellow students themselves, so that, in the end, Padlet supports collaborative learning between fellow students or with lecturers. This research will focus on the Quantitative Psychology Research Course.

Quantitative Psychology Research is one of the Professional Basic Courses (MKDP) in the Psychology undergraduate study program at the State University of Malang (UM). This course is expected to equip students with the skills to conduct psychological research using a quantitative approach. This curriculum at UM is in the process of implementing collaborative learning. However, the learning outcomes require Project-Based Learning (PBL) or Case-Based Learning (CBL),

so Padlets are used to monitor the process of identifying the phenomenon to be studied, discuss arising problems, and evaluate research instruments. Even though lectures in the UM environment have been conducted entirely offline, recordings have been used to help students remember key points, and the mentoring process runs more regularly, making padlets an important part of collaborative learning. The use of technology in the learning process will increase satisfaction in the learning process itself (Cavus, 2013).

Based on these conditions, this study aims to examine the role of Padlet in LMS-based collaborative learning. The researcher suspects that the level of collaboration in Padlet-based learning will be related to satisfaction with the LMS learning process.

METHOD

This research uses a correlational quantitative design with student respondents currently enrolled in the Quantitative Research Psychology Course. This study used a total sampling technique, including all students enrolled in the current semester's Quantitative Psychology Research Course as research respondents. The number of respondents, 43 students, reflects the actual class size and represents the learning context under study. Although the sample size is relatively small, it is still acceptable for an exploratory correlational analysis in classroom-based educational research, particularly when the objective is to understand relationships among variables in a specific learning setting rather than to generalize to a broader population.

Student participation in this study was voluntary. However, as a thank-you, the researcher awarded additional points to participants who agreed to participate in this study. The provision of additional points is intended as a form of appreciation for participation and does not affect the course's main academic grade. For students who do not participate in research activities, researchers provide additional assignments to earn extra points.

The instrument used to measure collaboration in this study was the student perception of the Padlet instrument (Dewitt et al., 2015), and student satisfaction with the LMS was measured using the perceived satisfaction dimension of the e-learning experience (Liaw, 2008). The student perception of Padlet has 11 items on a 1-5 scale, while perceived satisfaction has 5 items on the same scale. Both instruments, if they show higher scores, indicate that respondents' collaboration and satisfaction are improving.

Table 1. Descriptive Statistics

Variable	N	Mean	SD
Collaboration	43	39,60	5,40
Satisfaction	43	39,74	5,43

Table 2. Classification of Results

Variable	Classification				
	Very Low	Low	Medium	High	Very High
Collaboration	14	15	10	4	0
Satisfaction	2	13	15	11	2

From the two tables above, the average collaboration value is 39.60 with a standard deviation of 5.40. As for the satisfaction value, the average is 39.74 with a standard deviation of 5.43. Thus, the data is arranged into a classification based on empirical data; more complete results related to the existing classification can be observed directly in Table 2.

Validity and reliability tests of the instrument were conducted using Confirmatory Factor

Analysis (CFA). The collaboration variable was categorized as having absolute fit ($X^2 = 44.627$; $p = .105$). Regarding the variable satisfaction with the LMS, it is classified as a poor fit: $X^2 = 40.729$, $p = .009$; CFI = .926; TLI = .878; GFI = .989; RMSEA = .141. Confirmatory Factor Analysis (CFA) results indicate that the LMS satisfaction model has not yet met optimal goodness-of-fit criteria, as reflected in the RMSEA of .141 and TLI of .878. This value indicates that the instrument's factor structure in this research sample remains limited. Therefore, the CFA results in this study are treated as indicative, and the interpretation emphasizes the consistency of internal reliability and conceptual congruence with the measured constructs.

The internal reliability of the instruments was assessed using Cronbach's alpha. The collaboration instrument showed an alpha value of .785, indicating good internal reliability. Although advanced reliability measures, such as composite reliability, are not reported in this study, the alpha value remains acceptable for exploratory educational research with a limited sample size.

Table 3. Factor Loading

Variable	Item	95% CI		Factor loading
		Lower	Upper	
Collaboration	1	.257	.720	.636
	2	.167	.556	.488
	3	.197	.507	.798
	4	.135	.415	.484
	5	.263	.730	.644
	6	.225	.612	.715
	7	.082	.380	.345
	8	.295	.770	.746
	9	.167	.454	.680
	10	.263	.690	.734
Satisfaction	1	.192	.555	.594
	2	.159	.537	.543
	3	.260	.724	.611
	4	.259	.616	.674
	5	.697	1.200	.910
	6	.471	1.097	.686
	7	.262	.773	.583
	8	.435	.888	.767
	9	.561	1.136	.776

To provide a more detailed picture of the measurement quality, the standardized factor loadings of each item are reported. In general, most items showed factor loadings in the moderate to high range ($\lambda \geq 0.50$), although some were in the marginal category, as shown in Table 3. Given the limited sample size and classroom-based research context, the CFA results are treated as indicative of the structure of the measured constructs.

RESULTS AND DISCUSSION

A. Assumption Test

Prior to hypothesis testing, a series of assumption tests were conducted. The Kolmogo-

rov-Smirnov normality test indicated that the distributions of collaboration and satisfaction with the LMS scores were normal ($p > 0.05$). The linearity test showed that the deviation from linearity was not significant, indicating a linear relationship between the variables. Although the homogeneity test indicated heteroscedasticity, this condition is not a critical violation in correlational analysis. Thus, the key assumptions for Pearson's correlation were met.

The first assumption test we did was normality. The Kolmogorov-Smirnov test results indicated that the distribution of collaboration scores ($D(43) = .086$; $p = .200$) and satisfaction ($D(43) = .084$; $p = .200$) were normally distributed. Furthermore, for linearity testing, $F(16, 42) = .91$, $p = .569$, in the deviation-from-linearity row, indicating that the relationship between collaboration and satisfaction with the LMS is linear. Further testing of homogeneity in the collaboration and satisfaction scores found that the Levene statistic ($13, 25$) = 5.635, $p < .001$. So, the difference between the two variances is significant, suggesting heterogeneity. Thus, with all classical assumptions satisfied, the Pearson Product-Moment correlation test is considered methodologically appropriate for hypothesis testing.

Table 4. Assumption Test

Test	df	Coefficient	Significance
Normality	43	.086 (col)	.200
	43	.084 (satisfied)	.200
Linearity	16	.909	.569
	42		
Homogeneity	13	5.635	.000
	25		

B. Hypothesis Test

The hypothesis test used in this study will be the Pearson product-moment correlation test because it meets the assumptions required for this analysis. The results of the Pearson Product-Moment correlation test indicated a relationship between collaboration and satisfaction with the LMS ($r = .649$, $p < .001$; two-tailed; alternative hypothesis accepted). The relationship between the two variables is positive: the higher the level of collaboration with Padlets on the LMS, the higher the satisfaction with the LMS.

Table 5. Hypothesis Test

		Total Collaboration Score	Total Satisfaction Score Sipejar
Total Collaboration Score	Pearson Correlation	1	.649**
	Sig. (2-tailed)		.000
	N	43	43
Total Satisfaction Score Sipejar	Pearson Correlation	.649**	1
	Sig. (2-tailed)	.000	
	N	43	43

This study found a strong positive relationship between Padlet-based collaborative learning and student satisfaction with the Learning Management System (LMS). This finding suggests that integrating collaborative tools into the LMS not only serves as a medium for interaction but also enhances the overall quality of students' learning experience. This result reinforces the view that satisfaction with the LMS is determined not solely by its technical aspects but also by how it is used to facilitate active, student-centered learning (Çobanoğlu, 2018).

The findings of this study align with prior research indicating that a positive learning experience in an LMS contributes to student satisfaction (Diep et al., 2017; Xu & Mahenthiran, 2016). However, unlike some studies that position the LMS primarily as a content-delivery and task-management platform, this study highlights Padlet as a tool that strengthens the social dimension of collaborative learning. By allowing students to interact, share ideas, and monitor the work process transparently, Padlet extends the LMS's function beyond a mere administrative platform to a dynamic collaborative learning space.

In the context of the Quantitative Psychology Research course, Padlet is particularly relevant, as the methodological course demands individual accountability, ongoing discussion, and collective evaluation of the learning process. The integration of Padlet allows documentation of the discussion process and peer feedback, so that students are involved not only in completing the final assignment but also in reflecting on the group work process. This mechanism has the potential to increase students' cognitive and social engagement, thereby enhancing satisfaction with the LMS.

Theoretically, the results of this study support the collaborative learning framework that emphasizes the importance of social interdependence, meaningful interaction, and individual accountability in technology-based learning. In practice, the findings suggest that lecturers and higher education managers can integrate collaborative tools, such as Padlet, into the LMS to increase student satisfaction, particularly in student-centered learning. However, these findings need to be interpreted in light of the limitations of the sample size and the classroom-based research context, so future research is recommended to test them in broader contexts and populations.

CONCLUSION

This study found that collaboration via Padlets was associated with student satisfaction in the Quantitative Psychology Research Methods class. This research certainly reinforces the role of collaborative learning in student-centered education, especially in encouraging students to work together. In addition, the use of Padlets can encourage students' motivation to learn by allowing them to monitor their peers' progress through social comparison and to ensure each person's performance within a group. In the end, implementing collaborative lectures will lead to greater student satisfaction with the LMS at the State University of Malang.

Of course, this research can still be developed further. Some development research ideas from this research include testing differences in student collaboration between those who use the LMS as their only collaborative learning method and those who also use Padlets. In addition, this study has shortcomings: a limited number of respondents (43) and the possibility that respondents are aware of the study's purpose because they are currently learning research methodology in psychology.

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