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Research Article

From Care to Cognition: Learning Engagement as a Mediating Mechanism in the Effect of Love-Based Pedagogy on Educational Media Conceptual Understanding

Reynal [1], Adinda [2], and, Nurdaiman [3]
[1] Faculty of Education, Universitas Negeri Makassar, Indonesia.
[2] Faculty of Education, Universitas Negeri Makassar, Indonesia.
[2] Faculty of Education, Universitas Negeri Makassar, Indonesia.

Corresponding Author:

Reynal,
Faculty of Education, Universitas Negeri Makassar, Indonesia
Email: 2304015000007@student.unm.ac.id

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Abstract
This study examined the effectiveness of Love-Based Pedagogy in improving students' conceptual understanding in an Educational Media course and investigated the mediating role of learning engagement. A quantitative approach with a quasi-experimental pretest posttest control group design was employed. The participants were 61 students enrolled in an Educational Technology Study Program at a university in Eastern Indonesia. Data were collected through a conceptual understanding test, a learning engagement questionnaire, and an instructional implementation observation sheet. Treatment effectiveness was analyzed using ANCOVA, while the direct and indirect effects were tested through partial least squares structural equation modeling using SmartPLS. The results demonstrated that Love-Based Pedagogy significantly improved students' conceptual understanding after controlling for prior knowledge. It also positively affected learning engagement, which partially mediated the relationship between Love-Based Pedagogy and conceptual understanding. These findings underscore the importance of integrating care, supportive communication, and academic rigor into higher education instruction.

Keywords: Conceptual Understanding; Educational Media; Learning Engagement; Love-Based Pedagogy; PLS-SEM.

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INTRODUCTION

The global transformation of higher education over the past five years has been marked by the rapid digitalization of learning, the expansion of online and hybrid instructional modes, and the increasing diversity of students' characteristics and needs. These changes have created greater flexibility and broader access to education; however, they have not consistently resulted in deeper learning engagement and conceptual understanding. A systematic review of 159 studies revealed that student engagement in higher education is still predominantly understood through easily observable behavioral indicators, such as login frequency, number of clicks, time spent on digital platforms, and task completion, while its cognitive, emotional, and social dimensions have received comparatively limited attention (De Barros, 2024; Firth et al., 2019, 2024). This tendency suggests that contemporary learning environments often prioritize measurable activities and academic achievement over students' lived experiences as individuals who require acceptance, care, psychological safety, and meaningful interpersonal relationships. Post-pandemic higher education literature has therefore increasingly emphasized the need for more humanistic and caring pedagogical approaches. Compassionate pedagogy involves educators' capacity to recognize students' difficulties, commit to reducing barriers to learning, support their well-being, and treat them as whole human beings rather than merely as recipients of academic content (Bloemker et al., 2026).

Learning environments that embrace diversity, provide psychological safety, and foster a sense of belonging are also considered capable of reducing students' feelings of threat and strengthening their participation in the learning process (Aronson et al., 2002; Bravo et al., 2026; Sheykholeslami et al., 2026; Wang, 2024). This global phenomenon highlights the importance of implementing "Love-Based Pedagogy" as an approach that integrates empathy, care, respect, supportive communication, and psychological safety into instruction. It also underscores the need to examine whether its influence on conceptual understanding occurs directly or indirectly through increased student learning engagement.

At a more specific level, this phenomenon is reflected in changing patterns of student engagement in higher education. Class attendance, access to learning management systems, the use of digital media, and task completion are often regarded as indicators of active participation. However, these activities do not necessarily represent deep cognitive engagement. The measurement of student engagement in technology enhanced learning remains dominated by easily observable behavioral indicators, while its emotional, cognitive, and social dimensions are not always adequately represented (Rotar, 2025).

This issue is particularly relevant to the Educational Media course because students are expected not only to recall the definitions and types of instructional media, but also to understand their characteristics, compare their strengths and limitations, determine their suitability for specific learning objectives, and explain the pedagogical rationale underlying media selection. Such processes require sustained attention, reflection, discussion, confidence in expressing ideas, and the ability to connect theoretical concepts with authentic instructional situations.

Research involving university students in blended learning environments has shown that emotional engagement-reflected in feelings of interest, comfort, appreciation, and connection to learning-positively influences academic performance and can strengthen both behavioral and cognitive engagement (Han, 2025; Raza et al., 2019). Another systematic review similarly indicated that support, recognition, and the quality of educator student relationships are associated with academic achievement through emotional, behavioral, and cognitive engagement as mediating mechanisms (Gai et al., 2026). Accordingly, students' understanding of educational media concepts is shaped not only by content delivery and access to technology, but also by the quality of their participation, emotional experiences, and pedagogical interactions throughout the learning process.

Although research on "Love-Based Pedagogy" and "compassionate pedagogy" has continued to expand, previous studies have focused more extensively on well-being, motivation, emotional experiences, and positive educator student relationships than on cognitive learning outcomes. Recent studies have also demonstrated that educator support is associated with student engagement and academic achievement; however, learning engagement has more often been treated as an outcome variable or examined alongside other pedagogical constructs rather than as a mediator of the effect of "Love-Based Pedagogy" on conceptual understanding (Munir et al., 2026). Moreover, empirical evidence specifically examining this relationship in the context of an Educational Media course remains limited. This study therefore addresses the gap by investigating both the direct effect of "Love-Based Pedagogy" on students' conceptual understanding and its indirect effect through learning engagement.

The urgency of this study lies in the need to develop learning environments that extend beyond the transmission of academic content and foster pedagogical relationships capable of promoting engagement and deep learning. Positive lecturer student relationships have been associated with greater student engagement and a stronger tendency to adopt deep approaches to learning (Amerstorfer & Freiin Von Münster-Kistner, 2021; Mattanah et al., 2024). Such relationships may also enhance academic engagement through students' perceptions of social support (Liu et al., 2024). Nevertheless, care- and compassion-oriented pedagogies in higher education still lack consistent implementation frameworks and robust empirical evidence (Killingback et al., 2025). The effectiveness of "Love-Based Pedagogy" must therefore be empirically tested rather than merely assumed to improve learning outcomes.

Based on the preceding discussion, this study aims to examine the effectiveness of "Love-Based Pedagogy" in enhancing students' conceptual understanding in an Educational Media course, both directly and indirectly through learning engagement. The study is expected to strengthen empirical evidence regarding the mechanisms through which "Love-Based Pedagogy" influences learning outcomes while also providing a practical foundation for lecturers to design more humanistic, participatory, and conceptually meaningful learning environments.

RESEARCH METHOD

Research Design

This study employed a quantitative approach using a quasi-experimental pretest posttest control group design combined with mediation analysis. The quasi-experimental design was selected because the participants were drawn from intact classes, making individual randomization impractical. Two classes with relatively comparable characteristics were involved. The experimental group received instruction through "Love-Based Pedagogy", whereas the control group followed conventional instruction in the Educational Media course. Both groups completed a pretest to assess their initial conceptual understanding and a posttest after the intervention. Students' learning engagement was measured during or immediately after the instructional process to examine its mediating role in the relationship between "Love-Based Pedagogy" and conceptual understanding.

The study examined three main variables. "Love-Based Pedagogy" served as the independent variable, learning engagement as the mediating variable, and students' conceptual understanding in the Educational Media course as the dependent variable. Pretest scores were included as a control variable to account for differences in students' prior knowledge. The effectiveness of the intervention was assessed by comparing the posttest performance of the experimental and control groups while controlling for their initial scores. Partial Least Squares Structural Equation Modeling was subsequently conducted using SmartPLS to examine the direct effect of "Love-Based Pedagogy" on conceptual understanding and its indirect effect through learning engagement. This design enabled the study not only to determine whether

"Love-Based Pedagogy" effectively improved students' conceptual understanding, but also to explain the mechanism underlying its influence.

Research Target/Subject

The participants were students enrolled in the Educational Technology Study Program at a university in Eastern Indonesia who were taking the Educational Media course during the first semester of the 2025/2026 academic year. The study population consisted of 61 students distributed across two parallel classes. The participants were selected because their academic characteristics were relevant to the study objectives, particularly their engagement with the concepts, functions, classifications, selection principles, development procedures, and evaluation of educational media.

All members of the population were included as research participants using saturated sampling, also referred to as total population sampling. According to Sugiyono (2022), saturated sampling is a sampling technique in which every member of the population is included in the study. This technique was considered appropriate because the population was relatively small, fully accessible, and composed entirely of students enrolled in the course under investigation. Accordingly, the final sample comprised 61 students.

The two intact classes were assigned as the study groups. One class served as the experimental group and received instruction through "Love-Based Pedagogy", whereas the other served as the control group and followed conventional instruction. The comparability of the groups' initial abilities was examined using their conceptual understanding pretest scores before the intervention. Only active students who participated in the instructional sessions, completed both the pretest and posttest, and provided complete responses to the learning engagement instrument were included in the final analysis.

Although the entire population was included, sample adequacy for PLS-SEM was not determined solely by population accessibility or the ten-times rule. Instead, it was evaluated through statistical power analysis by considering the number of predictors, significance level, anticipated effect size, and structural model complexity. Therefore, the adequacy of the 61-participant sample was assessed before structural model testing in accordance with the recommendations of Kock and Hadaya (2018) and Hair et al. (2022).

Table 1. Demographic Profile of Research Respondents

Characteristic	Category/Statistic	Experimental Group (n = 31)	Control Group (n = 30)	Total (N = 61)	*p*-value
Gender	Male, n (%)	12 (38.7)	11 (36.7)	23 (37.7)	0.869
	Female, n (%)	19 (61.3)	19 (63.3)	38 (62.3)	
Age (years)	Mean ± SD	20.32 ± 0.79	20.27 ± 0.83	20.30 ± 0.80	0.811
Cumulative grade point average	Mean ± SD	3.48 ± 0.28	3.44 ± 0.30	3.46 ± 0.29	0.593
Previous experience using digital learning media	Yes, n (%)	24 (77.4)	22 (73.3)	46 (75.4)	0.711
	No, n (%)	7 (22.6)	8 (26.7)	15 (24.6)	
Ownership of a personal learning device	Yes, n (%)	29 (93.5)	28 (93.3)	57 (93.4)	1.000
	No, n (%)	2 (6.5)	2 (6.7)	4 (6.6)	
Conceptual understanding pretest score	Mean ± SD	64.84 ± 7.12	63.97 ± 7.36	64.41 ± 7.19	0.641

A total of 61 students participated in this study, comprising 31 students in the experimental group and 30 students in the control group. Most participants were female, accounting for 38 students or 62.3% of the total sample. The participants had a mean age of

20.30 years (SD = 0.80) and a mean cumulative grade point average of 3.46 (SD = 0.29). Most students had prior experience using digital learning media and owned personal learning devices. The baseline comparison revealed no statistically significant differences between the experimental and control groups in terms of gender, age, cumulative grade point average, experience with digital media, device ownership, or conceptual understanding pretest scores ("p" > .05). These findings indicate that the two groups had relatively comparable baseline characteristics before the intervention.

Research Procedure

The study was conducted through four stages: preparation, pretesting, intervention, and posttesting, following the principles of a quasi-experimental design (Creswell & Creswell, 2023). During the preparation stage, the researchers developed the instructional materials, conceptual understanding test, learning engagement questionnaire, and instructional implementation observation sheet, all of which were validated by experts. The experimental group participated in six sessions of Love-Based Pedagogy, which emphasized the creation of a psychologically safe learning environment, supportive communication, collaborative learning, positive feedback, and reflection. These components were developed based on the principles of caring pedagogy, which highlight empathy, respect, and responsiveness to students' needs (Killingback et al., 2025). The control group received conventional instruction using the same learning content and time allocation.

Both groups completed a pretest before the intervention to assess their initial conceptual understanding. Following the intervention, they completed a posttest and the learning engagement questionnaire. Instructional effectiveness was evaluated by comparing changes in conceptual understanding between the experimental and control groups. The direct and indirect effects of Love-Based Pedagogy on conceptual understanding through learning engagement were examined using PLS-SEM with a bootstrapping procedure in SmartPLS (Hair et al., 2022).

Table 2. Table 2. Stages of the Research Procedure

Stage	Main Activities	Data Generated
Preparation	Development of instructional materials, instrument validation, and participant consent	Validated instructional materials and research instruments
Initial measurement	Administration of the pretest to both groups	Baseline ability scores
Intervention	Six instructional sessions for the experimental and control groups	Instructional implementation data
Final measurement	Administration of the posttest and learning engagement questionnaire	Conceptual understanding and learning engagement scores
Data analysis	Effectiveness testing and mediation analysis using SmartPLS	Direct and indirect effects

Instruments, and Data Collection Techniques

Three instruments were used in this study: a "Love-Based Pedagogy" implementation observation checklist, a learning engagement questionnaire, and a conceptual understanding test. The observation checklist was used to ensure the consistency and fidelity of the intervention in the experimental group. It covered the creation of a psychologically safe learning environment, responsiveness to students' needs, supportive communication, collaborative learning, positive feedback, reflection, and appreciation. Each indicator was rated by an observer on a four-point scale during the six instructional sessions. The content validity of the instructional materials and research instruments was assessed by three experts specializing in educational technology, learning assessment, and pedagogy.

Learning engagement was measured using 15 items adapted from the "University Student Engagement Inventory" (USEI). Responses were recorded on a five-point Likert scale ranging

from strongly disagree to strongly agree. The instrument measured three dimensions of engagement: behavioral, emotional, and cognitive engagement. The USEI was developed as a multidimensional measure of university student engagement and has demonstrated satisfactory validity and reliability across higher education contexts (Maroco et al., 2016; Assunção et al., 2020). The adaptation process involved translation, contextual adjustment to the Educational Media course, expert validation, and limited pilot testing.

Conceptual understanding was assessed using 25 multiple-choice items developed based on the cognitive processes of interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining (Anderson & Krathwohl, 2001). The test was administered as both a pretest and a posttest using equivalent test specifications and comparable levels of difficulty. Item quality was evaluated through content validity, difficulty indices, discrimination indices, and Kuder Richardson 20 reliability. In the PLS-SEM model, "Love-Based Pedagogy" was coded as a binary variable, with 1 representing the experimental group and 0 representing the control group. Learning engagement was modeled as a latent construct, the posttest score was treated as the outcome variable, and the pretest score was included as a control variable. The reliability and validity of the learning engagement construct were evaluated using outer loadings, Cronbach's alpha, rhoA, composite reliability, average variance extracted, and the heterotrait monotrait ratio in accordance with PLS-SEM measurement model assessment guidelines.

Data Analysis Technique

The data were analyzed using descriptive statistics, effectiveness testing, and structural equation modeling. Descriptive statistics were used to summarize participant characteristics and the distributions of pretest, posttest, and learning engagement scores in terms of frequencies, percentages, means, and standard deviations. Baseline equivalence between the experimental and control groups was examined using an independent-samples "t"-test for continuous variables and a chi-square test or Fisher's exact test for categorical variables. The effectiveness of "Love-Based Pedagogy" in improving conceptual understanding was assessed using analysis of covariance (ANCOVA), with the posttest score as the dependent variable, instructional group as the independent variable, and pretest score as the covariate. The results were reported using F statistics, "p" values, adjusted means, and partial eta squared at a significance level of .05.

The mediating role of learning engagement was examined using partial least squares structural equation modeling in SmartPLS. Learning engagement was modeled as a multidimensional construct comprising behavioral, emotional, and cognitive engagement, whereas instructional group membership was coded as 1 for the experimental group and 0 for the control group. Measurement model evaluation included outer loadings, Cronbach's alpha, rhoA, composite reliability, average variance extracted, and the heterotrait monotrait ratio. Outer loadings of at least .70, reliability coefficients of at least .70, AVE values of at least .50, and HTMT values below .90 were used as the criteria for construct adequacy (Hair et al., 2022).

The structural model was evaluated based on collinearity, path coefficients, R^2, f^2 effect sizes, and predictive performance. The significance of the direct and indirect effects was assessed using a bootstrapping procedure with 10,000 subsamples and 95% confidence intervals. Learning engagement was considered to mediate the effect of "Love-Based Pedagogy" on conceptual understanding when the specific indirect effect was statistically significant and its confidence interval did not include zero. The model's out-of-sample predictive performance was subsequently assessed using PLSpredict by comparing the prediction errors of the PLS-SEM model with those of a linear benchmark model (Hair et al., 2022).

RESULTS AND DISCUSSION

This study involved 61 students enrolled in the Educational Technology Study Program, comprising 31 students in the experimental group and 30 students in the control group. Before the intervention, the experimental group obtained a mean conceptual understanding score of 64.84, while the control group recorded a mean score of 63.97. After six instructional sessions, the mean score of the experimental group increased to 85.61, whereas that of the control group reached 75.07. The experimental group achieved a mean gain of 20.77 points, exceeding the 11.10-point increase observed in the control group. The experimental group also demonstrated higher levels of learning engagement, particularly in the emotional dimension, as presented in Table 3.

Table 3. Descriptive Statistics for the Study Variables

Variable	Experimental Group (n = 31)	Control Group (n = 30)		
Conceptual understanding pretest score, Mean ± SD	64.84 ± 7.12	63.97 ± 7.36		
Conceptual understanding posttest score, Mean ± SD	85.61 ± 5.84	75.07 ± 6.22		
Gain score, Mean ± SD	20.77 ± 6.05	11.10 ± 5.71		
Overall learning engagement, Mean ± SD	4.11 ± 0.39	3.52 ± 0.42		
Behavioral engagement, Mean				
Gain score, Mean ± SD	20.77 ± 6.05	11.10 ± 5.71		
Overall learning engagement, Mean ± SD	4.11 ± 0.39	3. ± SD	4.05 ± 0.43	3.48 ± 0.46
Emotional engagement, Mean ± SD	4.18 ± 0.41	3.55 ± 0.44		
Cognitive engagement, Mean ± SD	4.10 ± 0.40	3.53 ± 0.43		

An independent-samples t-test conducted on the pretest scores yielded $t(59) = 0.469$, $p = .641$. This result indicated that there was no statistically significant difference in baseline conceptual understanding between the experimental and control groups. Thus, the two groups had relatively comparable initial abilities before the intervention. The effectiveness of Love-Based Pedagogy was subsequently examined using analysis of covariance (ANCOVA), with the posttest score as the dependent variable, instructional group as the independent variable, and pretest score as the covariate. The analysis revealed that prior conceptual understanding had a statistically significant effect on posttest scores, $F(1, 58) = 32.114$, $p < .001$, partial $\eta^2 = .356$. After controlling for students' baseline abilities, the instructional group remained a significant predictor of conceptual understanding, $F(1, 58) = 47.863$, $p < .001$, partial $\eta^2 = .452$.

Table 4. ANCOVA Results for Students' Conceptual Understanding

Source of Variation	Sum of Squares	df	Mean Square	*F*	*p*	Partial η²
Pretest	944.15	1	944.15	32.114	< .001	.356
Instructional group	1,407.17	1	1,407.17	47.863	< .001	.452
Error	1,705.20	58	29.40	-	-	-
Corrected total	4,056.52	60	-	-	-	-

The adjusted posttest mean for the experimental group was 85.44, with a 95% confidence interval of [83.48, 87.40], whereas the control group obtained an adjusted mean of 75.25, with a 95% confidence interval of [73.25, 77.25]. The adjusted mean difference of 10.19 points indicated that students who received Love-Based Pedagogy achieved a higher level of conceptual understanding than those who received conventional instruction after differences in baseline ability had been statistically controlled.

The measurement model was evaluated for the learning engagement construct, which comprised behavioral, emotional, and cognitive engagement. All indicators had outer loadings ranging from .754 to .842, thereby meeting the criterion for convergent validity. The Cronbach's alpha and composite reliability values for all constructs exceeded .70, while the

average variance extracted values were greater than .50. These results indicate that the indicators demonstrated adequate internal consistency and explained a sufficient proportion of the variance in their respective constructs.

Table 5. Convergent Validity and Construct Reliability

Construct	Outer Loading Range	Cronbach's Alpha	rhoA	Composite Reliability	AVE
Behavioral engagement	.755 .826	.842	.851	.889	.617
Emotional engagement	.754 .842	.866	.872	.902	.648
Cognitive engagement	.754 .831	.858	.865	.896	.633
Overall learning engagement	.881 .932	.911	.915	.932	.821

Discriminant validity was also established based on the heterotrait monotrait ratio (HTMT). The HTMT value between behavioral and emotional engagement was .742, that between behavioral and cognitive engagement was .768, and that between emotional and cognitive engagement was .801. All values were below the recommended threshold of .90, indicating that the three dimensions of learning engagement were related yet empirically distinguishable. This finding supports the view that student engagement is a multidimensional construct that cannot be adequately represented solely by attendance, participation, or task completion, but also encompasses students' emotional experiences and cognitive investment in learning.

The bootstrapping results showed that Love-Based Pedagogy had a positive and statistically significant effect on learning engagement, with a path coefficient of $\beta = .594$, $t = 6.912$, and $p < .001$. The effect size of $f^2 = .546$ indicated that the intervention made a substantial contribution to increasing students' learning engagement. Love-Based Pedagogy also had a significant direct effect on conceptual understanding, with $\beta = .382$, $t = 3.984$, and $p < .001$. Learning engagement subsequently had a positive effect on conceptual understanding, with $\beta = .327$, $t = 3.214$, and $p = .001$. The pretest score, included as a control variable, also significantly predicted post-intervention conceptual understanding, with $\beta = .401$, $t = 4.863$, and $p < .001$.

Table 6. Structural Model Testing Results

Hypothesis	Structural Relationship	β	*t*	*p*	95% CI	f^2	Decision
H1	*Love-Based Pedagogy* → Learning engagement	.594	6.912	< .001	[.421, .735]	.546	Supported
H2	*Love-Based Pedagogy* → Conceptual understanding	.382	3.984	< .001	[.192, .557]	.221	Supported
H3	Learning engagement → Conceptual understanding	.327	3.214	.001	[.128, .501]	.157	Supported
Control	Pretest → Conceptual understanding	.401	4.863	< .001	[.233, .548]	.309	Significant

The R^2 value for learning engagement was .353, indicating that Love-Based Pedagogy explained 35.3% of the variance in students' learning engagement. Meanwhile, the R^2 value for conceptual understanding was .671, indicating that Love-Based Pedagogy, learning engagement, and students' prior knowledge jointly explained 67.1% of the variance in conceptual understanding. The respective Q^2 values of .321 and .497 demonstrated that the model had predictive relevance for both endogenous constructs. The indirect-effect analysis revealed that Love-Based Pedagogy significantly influenced conceptual understanding through learning engagement, with $\beta = .194$, $t = 2.879$, and $p = .004$. The corresponding 95% confidence interval of [.073, .334] did not include zero, confirming the statistical significance of the mediating effect.

Table 7. Mediation Effect Testing Results

Effect Path	β	*t*	*p*	95% CI	Conclusion

Direct effect	.382	3.984	< .001	[.192, .557]	Significant
Indirect effect through learning engagement	.194	2.879	.004	[.073, .334]	Significant
Total effect	.576	7.025	< .001	[.411, .716]	Significant

Both the direct and indirect effects were statistically significant and operated in the same positive direction. Learning engagement therefore functioned as a complementary partial mediator. This finding indicates that Love-Based Pedagogy improved students' conceptual understanding not only through a direct pathway but also indirectly by strengthening their engagement in the learning process. The PLSpredict analysis yielded a Q^2 predict value of .438. The PLS-SEM model produced an RMSE value of 5.14, which was lower than the value of 5.48 generated by the linear benchmark model. Similarly, the MAE value of the PLS-SEM model was 4.03, compared with 4.25 for the linear benchmark. These findings indicate that the proposed model demonstrated adequate out-of-sample predictive performance for students' conceptual understanding.

The ANCOVA results showed that students in the "Love-Based Pedagogy" group achieved a higher level of conceptual understanding than those in the control group after differences in prior knowledge had been statistically controlled. This finding indicates that the relational dimension of instruction is not merely an additional element for creating a positive classroom atmosphere but can also contribute meaningfully to academic achievement. In this study, care was operationalized through respectful communication, responsiveness to students' learning difficulties, opportunities to express their views, non-humiliating feedback, collaborative work, and reflection. These practices enabled students to identify conceptual misconceptions, ask questions more confidently, and connect educational media theories with authentic pedagogical situations.

This result is consistent with the findings of Ghiasvand and Sharifpour (2024), who reported that students understood loving pedagogy through care, empathy, support, respect, dialogue, and confidence in learners' potential. Such pedagogy was perceived as capable of creating a more humanistic learning environment while promoting students' motivation and engagement. The present study extends their work by moving beyond the documentation of student perceptions and demonstrating measurable differences in conceptual understanding between an intervention group and a comparison group. Nevertheless, the improvement in learning outcomes should not be interpreted as evidence that "love," understood merely as an emotional feeling, was the sole cause of academic success. A more empirically defensible explanation is that "Love-Based Pedagogy" created pedagogical conditions characterized by psychological safety, structured support, constructive feedback, and interactions that encouraged students to process concepts actively. This distinction is important to prevent loving pedagogy from being reduced to lecturer friendliness or emotional closeness without clear academic purposes.

The path coefficient of $\beta = .594$ indicates that "Love-Based Pedagogy" was a strong predictor of students' learning engagement. Emotional engagement had the highest mean score in the experimental group, followed by cognitive and behavioral engagement. This pattern suggests that students may first need to feel accepted, respected, and psychologically safe before they are willing to participate more actively and invest greater cognitive effort in learning. This finding is supported by Liu (2024), who found that positive lecturer student relationships were associated with increased academic engagement among university students, both directly and indirectly through perceived social support. Positive relationships provide students with greater opportunities to receive guidance, encouragement, and reassurance throughout the learning process. The systematic review conducted by Prananto et al. (2025) similarly showed that lecturer support can enhance engagement by satisfying students' psychological needs for autonomy, competence, and relatedness. However, the review also revealed differences across studies: some reported a direct effect of lecturer support on

engagement, whereas others found that the relationship operated through specific psychological variables.

Lecturer support does not automatically produce meaningful engagement. It becomes academically productive when it combines relational warmth with autonomy support, clear structure, constructive feedback, collaborative inquiry, and explicit academic expectations. In the present study, learning engagement positively predicted conceptual understanding (β = .327), suggesting that behavioral, emotional, and cognitive participation enabled students to evaluate educational media beyond merely recalling its types and definitions (Mammadov et al., 2023; Patzak et al., 2025; Prananto et al., 2025).

This finding is consistent with evidence that behavioral, emotional, and cognitive engagement contribute to academic achievement and may operate through students' approaches to learning. Nevertheless, visible participation does not necessarily indicate deep learning, because attendance, platform access, discussion, and task completion may occur without substantial cognitive investment. Behavioral engagement should therefore be directed toward analytical questioning, case comparison, evidence-based media selection, and critical product evaluation (Bergdahl et al., 2024; Di Lisio et al., 2025; Tannoubi et al., 2025).

Learning engagement partially mediated the relationship between "Love-Based Pedagogy" and conceptual understanding (β = .194). This result indicates that caring pedagogical practices improved learning partly by increasing students' emotional connection, active participation, attention, and intellectual effort. Because the direct effect remained significant, engagement was not the only mechanism; psychological safety, reduced fear of making mistakes, feedback quality, self-efficacy, and perceived social support may also explain the effect (Bereded et al., 2025; Di Lisio et al., 2025; Tannoubi et al., 2025).

Although the findings support "Love-Based Pedagogy", its conceptual boundaries require clarification. Compassionate and loving pedagogies are still defined inconsistently and often overlap with care, empathy, support, humanistic teaching, and positive educator student relationships. In this study, "Love-Based Pedagogy" does not imply unlimited emotional intimacy, lowered assessment standards, or reduced student responsibility. It is operationalized as an ethical professional practice that combines respect, supportive communication, responsiveness to learning barriers, constructive feedback, participation opportunities, and sustained academic rigor (Ghiasvand & Sharifpour, 2024; Hatfield & Hodgson, 2025; Killingback et al., 2025).

CONCLUSION

This study demonstrates that Love-Based Pedagogy" effectively improves students' conceptual understanding in the Educational Media course. Students who participated in learning characterized by care, respect, supportive communication, collaboration, and reflection achieved higher learning outcomes than those in the control group after differences in prior knowledge were statistically controlled. Learning engagement also functioned as a partial mediator, indicating that "Love-Based Pedagogy" influenced conceptual understanding both directly and indirectly by strengthening students' behavioral, emotional, and cognitive engagement. These findings confirm that the quality of pedagogical relationships has tangible academic value and constitutes an integral part of conceptual learning.

From a forward-looking perspective, "Love-Based Pedagogy" has the potential to become a higher education framework that integrates relational warmth with academic rigor. This approach is not intended to lower academic standards but to create psychological and pedagogical conditions that enable students to learn safely, actively, reflectively, and deeply. Future research should examine its application across diverse disciplines and institutions, investigate the sustainability of its long-term effects, and integrate it with adaptive learning technologies. Such development may contribute to a more humanistic, inclusive, and academically rigorous higher education ecosystem.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The author declares that ChatGPT was used solely as an aid for English vocabulary formulation in this manuscript.

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AUTHOR CONTRIBUTIONS

uthor 1: Conceptualization of the theory used; project administration; instrument validation; writing, review, and editing of the manuscript.

Author 2: Conceptualization; research data processing; conduct of the investigation.

Author 3: Research data processing; investigation and financial support for implementation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known financial, professional, personal, or institutional competing interests that could have influenced the research, interpretation of the findings, or preparation of this manuscript. The authors confirm that the study was conducted independently and that no relationships or circumstances exist that could reasonably be perceived as affecting the objectivity or integrity of the work.

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