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Development and Validation of an Integrated Problem Based Learning and E-Learning Model to Enhance Literary Analysis Skills in Higher Education

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Abstract: This study aims to develop and examine the effectiveness of an integrated Problem-Based Learning (PBL) and e-learning model in enhancing students' literary analysis skills in the Literary Theory and Criticism course. The study is grounded in the identified gap between students' conceptual understanding of literary theory and their ability to apply it critically in textual analysis. Employing a Research and Development (R&D) design with a mixed-method approach, the research was conducted in the English Literature Study Program at Muhammadiyah University of Gorontalo. The development process followed the ADDIE framework, encompassing the stages of analysis, design, development, implementation, and evaluation. Nine fourth-semester students participated in a limited trial using a one-group pretest-posttest design. Data were collected through validation sheets, classroom observations, reflective journals, and literary analysis essay tests. Quantitative data were analyzed using descriptive statistics, normalized gain (N-Gain), and paired-sample t-tests, while qualitative data were examined through thematic analysis. The findings indicate that the developed model meets three essential criteria of educational product quality: validity, practicality, and effectiveness. Expert validation results demonstrate high levels of content and construct validity. The implementation of the model revealed strong student engagement and positive responses toward digitally supported collaborative learning. Statistical analysis shows a significant improvement between pretest and posttest scores, with high N-Gain categories across all indicators. The integration of PBL and e-learning fosters student-centered learning, critical thinking, collaborative inquiry, and the strengthening of digital literacy skills.

Keywords: problem-based learning, e-learning integration, literary analysis skills, student-centered learning, digital humanities

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Introduction

The teaching of literary theory and criticism holds a strategic position in higher education, particularly within English Literature programs, as it plays a crucial role in shaping students' critical and analytical thinking skills in examining literary works. Mastery of theory is not limited to conceptual understanding but extends to the ability to apply critical approaches in conducting in-depth and contextual textual analysis. As emphasized by Terry Eagleton (1943: vii, 3-5), literary theory provides a framework that enables readers to understand how meaning is constructed within texts. Therefore, the

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quality of instruction in literary theory and criticism significantly determines the academic quality of graduates and their intellectual capacity to produce theoretically grounded and argumentative analyses.

However, empirical evidence reveals a gap between students' theoretical knowledge and their ability to apply it analytically in literary interpretation. Recent studies indicate that students frequently struggle to comprehend abstract and complex theoretical concepts and to apply them appropriately in textual analysis (Nawi & Nor, 2023: 136). In the English Literature Study Program at Muhammadiyah University of Gorontalo, instruction remains predominantly lecturer-centered, positioning students as passive recipients of information. Such instructional practices limit active student engagement and reduce opportunities to practice applying theory in authentic contexts (Prince, 2004: 224). Consequently, students' analyses tend to be descriptive rather than interpretative and lack theoretical depth.

Several studies demonstrate that Problem-Based Learning (PBL) effectively enhances critical thinking and problem-solving skills through student-centered learning environments (Savery, 2006: 55; Markusic & Sabljic, 2019: 102-105). Furthermore, the integration of digital technology in education has been shown to expand access to learning resources, increase flexibility, and strengthen academic interaction (Pedro et al., 2018: 3; Di Nardo, 2018: 66). The integration of PBL with e-learning, in particular, has been reported to improve collaborative learning quality and facilitate more effective feedback processes (Ge & Huang, 2022: 3). Nevertheless, most implementations of technology-integrated PBL have focused on science-related disciplines, while its application in literary theory and criticism instruction in higher education remains relatively limited (Anggraeni et al., 2023: 145-148).

The scientific novelty of this study lies in the contextual development of an integrated Problem-Based Learning (PBL) and e-learning model specifically designed for literary theory and criticism instruction, with a primary focus on enhancing literary analysis skills. The proposed model not only adapts the core syntax of PBL but also incorporates procedural guidance for digital platform utilization and contextual simulation based on literary texts. This integration is designed to bridge the abstract nature of literary theory with concrete analytical practice, thereby reducing the gap between theoretical understanding and students' analytical competence.

Based on this background and the current state of research, the primary research problem addressed in this study concerns how to develop and empirically test an integrated PBL and e-learning model that is both effective and practical in improving students' literary analysis skills. Accordingly, this article aims to describe the objective conditions of literary theory and criticism instruction, develop an integrated PBL and e-learning model aligned with the characteristics of literary studies, and evaluate its effectiveness and practicality in enhancing students' critical and analytical thinking skills.

Research Method

This study employed a Research and Development (R&D) design aimed at developing and validating an integrated Problem-Based Learning (PBL) and e-learning model to enhance students' literary analysis skills. The R&D approach was selected because it enables systematic development, validation, and empirical testing of educational products (Borg & Gall, 1989). To obtain comprehensive findings, the study adopted a mixed-method design combining quantitative and qualitative data, allowing for triangulation and deeper interpretation of instructional effectiveness (Creswell & Creswell, 2017).

The study was conducted in the English Literature Study Program at Muhammadiyah University of Gorontalo, Indonesia, during the 2024/2025 academic year. Nine fourth-semester students enrolled in the Literary Theory and Criticism course participated in the limited trial phase. Participants were selected through purposive sampling based on active classroom involvement. Two senior lecturers served as expert validators and practitioners to evaluate the feasibility of the developed model.

The instructional model was developed using the ADDIE framework (Analysis, Design, Development, Implementation, Evaluation), adapted from the instructional systems design model proposed by Dick, Carey, and Carey (2014). The ADDIE framework was selected due to its structured yet flexible procedure for technology-based instructional development.

During the analysis stage, classroom observations, semi-structured interviews, and needs assessment surveys were conducted to identify gaps between students' theoretical understanding and their practical analytical skills. Findings indicated that students struggled to operationalize abstract literary theories in textual analysis and that instruction remained predominantly lecture-based.

In the design stage, the integrated PBL and e-learning syntax was structured into three main phases: (1) problem orientation, (2) collaborative exploration and knowledge construction, and (3) digital-based reflection and evaluation. The adopted PBL principles emphasized authentic problems, collaborative inquiry, and reflective practice, which have been shown to effectively develop higher-order thinking skills (Savery, 2006).

The development stage included the preparation of a model handbook, Semester Learning Plan (RPS), digital modules, student worksheets, and literary analysis assessment rubrics. Content and construct validity were evaluated by experts using a five-point Likert scale. Inter-rater reliability was calculated using Percentage of Agreement to ensure scoring consistency.

The implementation stage employed a one-group pretest-posttest design to test the effectiveness of the developed model. Students completed a literary analysis test before and after the intervention. The instrument consisted of analytical essay tasks based on literary texts, assessed using a rubric measuring theoretical accuracy, argument coherence, interpretative depth, and textual evidence usage.

In addition to quantitative data, qualitative data were collected through classroom observations, students' reflective journals, and LMS discussion transcripts. These data were used to explore students' learning experiences and engagement patterns during model implementation.

Quantitative data were analyzed using descriptive statistics to calculate means and percentage improvement. Learning gains were measured using the normalized gain (N-Gain) formula, interpreted according to the criteria proposed by Hake (1999), which categorizes gains as low, medium, or high. A paired-sample t-test was conducted to determine the statistical significance of differences between pretest and posttest scores.

Qualitative data were analyzed using thematic analysis procedures, including data reduction, coding, categorization, and interpretative synthesis (Creswell, 2017). Data source triangulation was applied to enhance credibility and validity.

Results and Discussion

This section comprehensively presents the results of the development and implementation of the integrated Problem-Based Learning (PBL) and e-learning instructional model in the Literary Theory and Criticism course within the English Literature Study Program at Muhammadiyah University of Gorontalo. The model development process was conducted through three major phases: (1) preliminary study, (2) development and validation, and (3) testing and implementation. These phases were systematically designed using the ADDIE framework (Analysis, Design, Development, Implementation, and Evaluation) to ensure that the resulting model fulfilled the criteria of validity, practicality, and effectiveness.

Preliminary Study Phase

The preliminary study phase began with an extensive literature review of constructivist learning theory, Problem-Based Learning, and technology-enhanced learning. This review aimed to strengthen the conceptual foundation of the instructional model and ensure theoretical alignment with

contemporary pedagogical principles. In addition, a needs analysis was conducted using Kaufman's (1972) Needs Assessment Model to identify discrepancies between the actual instructional conditions and the desired learning outcomes.

The findings of the needs analysis revealed that students encountered significant difficulties in applying Structuralism, Feminism, and Postcolonialism theories in literary text analysis. Although students demonstrated basic conceptual familiarity with these theoretical frameworks, they struggled to operationalize theoretical concepts into coherent analytical arguments. Furthermore, classroom instruction remained predominantly lecturer-centered, and the Learning Management System (LMS) had not been optimally utilized as an interactive academic platform.

Table 1: The results of the needs analysis are summarized in the following:

Aspect	Actual Condition	Ideal Condition
Theoretical Understanding	Conceptual but not yet applicable	Able to apply theory effectively in literary analysis
Student Engagement	Tends to be passive	Active and collaborative participation
Technology Utilization	Limited to material distribution	Interactive and collaborative use through LMS
Analytical Skills	Not yet comprehensive	Analytical, reflective, and argumentative

Model Development

The instructional model was developed systematically through the ADDIE framework, encompassing the stages of Analysis, Design, Development, Implementation, and Evaluation. Each stage was structured to ensure alignment between identified instructional needs, theoretical foundations, and the intended learning outcomes. The development process resulted in a structured learning model integrating Problem-Based Learning (PBL) principles with e-learning components to enhance students' literary analysis skills.

The finalized model consists of three main instructional phases, which represent the core syntax of the integrated PBL and e-learning approach:

Diagram 1. Structure of the Integrated PBL and E-Learning Model

More specifically, the syntactic structure of the model is presented as follows:

Table 2. Syntax of the Integrated PBL and E-Learning Model

Phase	Syntax
Orientation	LMS utilization; introduction to literary text-based problems
Exploration & Knowledge Construction	Collaborative discussion; independent learning; problem analysis; contextual simulation
Reflection & Evaluation	Identification of knowledge gaps; solution sharing; solution implementation; reflection and evaluation

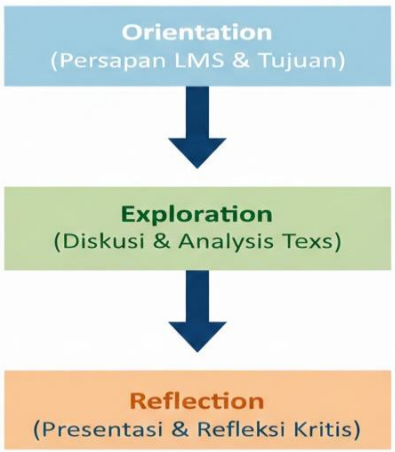
The characteristics of this model are grounded in Barrows' (1986) theoretical framework, which emphasizes authentic problem-based learning that is student-centered in nature. Within this perspective, learning is initiated through real and meaningful problems that stimulate inquiry and self-directed investigation. Hmelo-Silver (2004) further argues that PBL promotes deep cognitive processing through structured collaboration, scaffolding, and reflective practice, enabling students to construct knowledge actively rather than passively receiving information.

The integration of e-learning components is conceptually reinforced by the Community of Inquiry framework proposed by Garrison and Anderson (2003), which highlights the importance of cognitive presence, social presence, and teaching presence in creating meaningful online learning experiences. Through the LMS, students engage not only in content exploration but also in dialogical interaction and reflective discourse, thereby strengthening collaborative inquiry and sustaining higher-order analytical thinking.

Student Learning Activities

Observations of 22 categories of student learning activities indicated a high level of implementation across the three instructional phases of the integrated PBL and e-learning model. The observation results demonstrate that students were consistently engaged in structured academic tasks aligned with the designed learning syntax.

Diagram 2. Pattern of Student Learning Activities



During the orientation phase, students actively accessed the syllabus and Semester Learning Plan (RPS) through the LMS and engaged with the initial literary problem scenarios. In the exploration phase, they participated intensively in collaborative discussions, theoretical application, and analytical

exercises. In the final phase, students presented their analytical findings and engaged in reflective evaluation, demonstrating metacognitive awareness and deeper theoretical integration.

The observed activity pattern confirms a pedagogical shift toward student-centered learning, where students actively construct knowledge through inquiry, collaboration, and digital engagement rather than passively receiving information.

Pre-Test and Post-Test Results

The research instruments included pre-test and post-test assessments designed to measure five indicators of literary analysis skills: theoretical accuracy, argumentative coherence, interpretative depth, contextual understanding, and use of textual evidence. The comparative statistical results indicate a substantial improvement in students' analytical performance following the intervention.

Table 3. Pre-Test and Post-Test Statistics

Statistic	Pre-Test	Post-Test
Mean	77.888889	96.333333
Variance	4.111111	4.250000
Observations	9	9
df	16	
t Stat	-30.563077	
P (two-tail)	0.000000	

The mean score increased from 77.89 in the pre-test to 96.33 in the post-test, indicating a substantial improvement in literary analysis performance. The paired-sample t-test yielded a t-value of -30.563 with a two-tailed significance value (p) of 0.000, demonstrating a statistically significant difference between pre-test and post-test scores at the 0.05 significance level.

The relatively stable variance between the two tests suggests consistency in score distribution while reflecting a marked upward shift in overall performance. These findings provide strong empirical evidence that the integrated PBL and e-learning model effectively enhances students' literary analysis skills.

E. N-Gain Analysis

The calculation of normalized gain (N-Gain) was conducted using the formula proposed by Hake (1999) to measure the magnitude of learning improvement following the implementation of the integrated PBL and e-learning model. The results indicate that all measured indicators fall within the high gain category, demonstrating substantial improvement in students' literary analysis competencies.

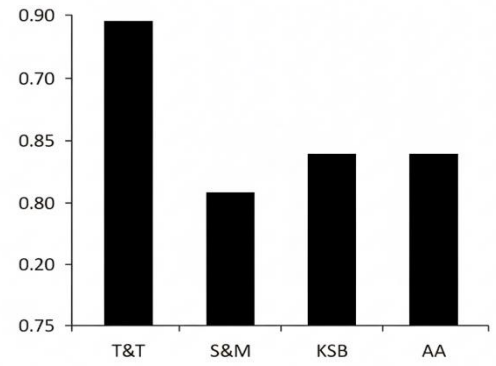
Table 4. N-Gain Scores by Indicator

Indicator	N-Gain	Category
Theory & Technology	0.89	High
Structure & Meaning	0.84	High
Socio-Cultural Context	0.82	High

Indicator	N-Gain	Category
Theoretical Evaluation	0.82	High
Academic Argumentation	0.81	High

The findings show that the highest gain (0.89) was achieved in the "Theory & Technology" indicator, suggesting that the integration of literary theory with digital literacy practices significantly enhanced students' analytical performance. This result indicates that students not only improved in theoretical comprehension but also became more proficient in utilizing digital platforms to construct and communicate analytical arguments.

Diagram 3. N-Gain Improvement Curve



- T&T = Theory & Technology
- S&M = Structure & Meaning
- SCC = Socio-Cultural Context
- TE = Theoretical Evaluation
- AA = Academic Argumentation

The curve illustrates a consistently high improvement trend across all five indicators, with only slight variation in gain levels. The relatively balanced distribution of N-Gain scores confirms that the instructional model did not enhance a single isolated skill but systematically improved multiple dimensions of literary analysis competence.

Overall, the N-Gain results reinforce the statistical findings from the paired-sample t-test, providing further empirical evidence of the model's effectiveness in fostering higher-order thinking, theoretical application, and digitally mediated academic argumentation.

Normality Test

Prior to conducting the hypothesis testing, the data were examined for normality using the Lilliefors test. This procedure was applied to determine whether the distribution of pre-test and post-test scores met the assumption of normality required for parametric statistical analysis, particularly the paired-sample t-test.

Table 5. Results of the Normality Test

Criterion	Lcalculated	Ltable	Conclusion
Lilliefors	0.1509	0.18	Normally Distributed

The results indicate that the calculated L-value (0.1509) is lower than the critical L-table value (0.18). Since Lcalculated < Ltable, the data are considered to be normally distributed. Therefore, the assumption of normality is satisfied, and the dataset meets the prerequisite for conducting a paired-sample t-test.

This finding confirms the statistical validity of subsequent hypothesis testing and strengthens the reliability of the inferential conclusions regarding the effectiveness of the integrated PBL and e-learning model.

This study developed an integrated Problem-Based Learning (PBL) and e-learning model to enhance students' literary analysis skills in the Literary Theory and Criticism course. The development of this model was motivated by the persistent gap between students' conceptual understanding of literary theory and their ability to apply theoretical frameworks critically in textual analysis. Theoretically, the model is grounded in constructivism, which emphasizes that knowledge is actively constructed by learners through social interaction and meaningful learning experiences (Piaget, 1970; Vygotsky, 1978). Within this perspective, students are no longer positioned as passive recipients of information but as active agents who construct meaning through engagement with authentic problems.

The PBL approach adopted in this model draws upon Barrows' (1986) conception of problem-based learning, which positions problems as the starting point of instruction. This framework is reinforced by Hmelo-Silver's (2004) argument that PBL effectively develops higher-order thinking skills through investigation, scaffolding, and collaborative inquiry. The integration of e-learning is informed by the Community of Inquiry framework proposed by Garrison and Anderson (2003), which highlights the importance of cognitive presence, social presence, and teaching presence in creating meaningful online learning experiences. Accordingly, the Learning Management System (LMS) functions not merely as a content delivery platform but as an intellectual space that facilitates extended discussion, reflection, and collaborative knowledge construction.

The developed model is structured systematically into three main phases orientation, exploration, and reflection-evaluation which are operationalized into ten instructional steps. These steps include platform introduction, problem identification, collaborative discussion, independent learning, textual analysis, contextual simulation, identification of knowledge gaps, knowledge sharing, solution development, and reflective evaluation. This structure demonstrates coherence among constructivist learning theory, the PBL approach, and digital technology integration. Pedagogically, the syntax promotes self-directed learning, consistent with Bandura's (1986) social cognitive theory, which asserts that effective learning occurs when individuals exercise self-regulation and engage in social interaction.

The findings indicate that the model satisfies three primary criteria of educational product development: validity, practicality, and effectiveness (Nieveen, 2007). Model validity was established through comprehensive theoretical review and expert validation, which demonstrated a very high level of content and construct alignment. Practicality was reflected in the successful implementation of the instructional syntax, categorized as excellent, and in students' positive responses regarding the clarity of learning stages and the usability of the LMS. Effectiveness was evidenced by a significant improvement in Literary Analysis Skills (LAS), as indicated by high N-Gain scores and paired-sample t-test results demonstrating a statistically significant difference between pre-test and post-test scores.

Pedagogically, the implementation of this model demonstrates a transformation from teacher-centered instruction to student-centered learning. Students not only acquired conceptual knowledge of

literary theory but were also able to apply theoretical frameworks in structured problem-based discussions and academic argumentation. In this process, literary theory was no longer perceived as a set of abstract definitions but as a contextual and operational analytical tool. The integration of digital technology, including digital text analysis tools, further strengthened students' digital literacy and expanded the practice of digital humanities within contemporary literary studies.

Furthermore, the model contributes novelty through a specifically designed integrated PBL and e-learning syntax tailored to literary theory and criticism instruction in higher education. This innovation lies in the substantive integration of problem-solving processes, digital collaboration, critical reflection, and structured assessment of analytical skills. Although the implementation was limited to a single class, the pilot results demonstrate a very high level of effectiveness and provide strong empirical foundations for broader-scale application. Therefore, this study not only offers practical contributions to innovation in literary pedagogy but also enriches theoretical discussions on technology-enhanced instructional design in higher education.

Conclusion

Based on the research findings and discussion, it can be concluded that the integrated Problem-Based Learning (PBL) and e-learning model developed in this study effectively addresses the instructional challenges in teaching literary theory and criticism, which have traditionally been conceptual and lecturer-centered in nature. The model was systematically designed using the ADDIE framework and grounded in constructivist learning theory and PBL principles, enabling it to bridge the gap between abstract theoretical understanding and students' practical analytical competence in literary text interpretation. The three main instructional phases orientation, exploration and knowledge construction, and reflection-evaluation demonstrate coherence between pedagogical design and the specific needs of literary studies in higher education.

Empirically, the model fulfills the three primary criteria of educational product development: validity, practicality, and effectiveness. Model validity was confirmed through expert evaluation of content and construct dimensions, both of which achieved very high ratings. Practicality was reflected in the consistent implementation of the instructional syntax and students' positive responses toward the LMS-supported problem-based approach. Effectiveness was demonstrated through significant improvement in pre-test and post-test scores, high N-Gain values across all literary analysis skill indicators, and statistically significant differences confirmed through inferential testing. These findings indicate that the model is not only theoretically sound but also empirically impactful in improving instructional quality.

Pedagogically, the implementation of this model promotes a transformation from teacher-centered instruction to student-centered learning. Students actively engage in identifying problems, collaboratively discussing texts, constructing theory-based arguments, and reflecting on their cognitive processes. The integration of e-learning expands academic interaction through online discussions, resource sharing, and digital feedback, fostering a dynamic and reflective learning community. Consequently, literary theory and criticism instruction evolves beyond conceptual mastery into a contextual, critical, and argumentative analytical process.

The scientific contribution of this study lies in the development of a contextually designed integrated PBL and e-learning syntax tailored specifically for literary studies, as well as in the operationalization of measurable literary analysis skill indicators. The model integrates problem-solving, digital collaboration, and critical reflection as core instructional components. Furthermore, this study advances digital humanities practices in literary education by positioning technology as an integral element of analytical processes rather than merely an administrative tool.

Nevertheless, this study is limited by the small number of participants and the implementation scope restricted to a single class. Therefore, further research is recommended to test the model on a

larger scale using experimental designs involving control groups and diverse institutional contexts. Future development may also focus on integrating more advanced text analysis technologies and applying the model to other literary courses. With broader validation, the integrated PBL and e-learning model has the potential to become a sustainable pedagogical innovation in enhancing the quality of literary theory and criticism instruction in higher education.

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