

DEVELOPMENT AND VALIDATION OF AUGMENTED REALITY-BASED POETRY LEARNING MEDIA FOR ENHANCING LITERARY ANALYSIS SKILLS AMONG SENIOR HIGH SCHOOL STUDENTS

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Abstract

This study aimed to develop, validate, and evaluate the effectiveness of Augmented Reality (AR)-based poetry learning media in enhancing students' literary analysis skills in Indonesian language learning. The study employed a Research and Development (R&D) approach using the ADDIE model, which consists of Analysis, Design, Development, Implementation, and Evaluation phases. The participants were Grade X students of SMA Negeri 1 Paranginan, Indonesia, during the 2025/2026 academic year. The developed AR media was designed to visualize abstract poetic elements, including imagery, symbolism, tone, theme, and message, through interactive three-dimensional objects and multimedia features. Data were collected through expert validation sheets, student response questionnaires, observations, and literary analysis achievement tests. The validation results indicated that the AR media was highly feasible for instructional use, with material expert validation reaching 80.6%, instructional design expert validation 92.0%, and media expert validation 88.3%. Practicality testing demonstrated positive student responses, with average scores exceeding 85% across individual, small-group, and field trials. The effectiveness analysis revealed that students who learned using the AR media achieved significantly higher literary analysis skills than those receiving conventional instruction. The experimental group obtained a mean score of 83.11, while the control group achieved 76.08. Independent-samples t-test results showed a statistically significant difference between groups ($p < .05$). These findings suggest that AR-based poetry learning media effectively enhances students' engagement, comprehension, and literary analysis skills by transforming abstract poetic concepts into meaningful and interactive learning experiences. Therefore, the developed media is considered valid, practical, and effective for senior high school poetry instruction.

Keywords: *Augmented Reality, Poetry Learning, Literary Analysis Skills, Interactive Learning Media, Educational Technology*

INTRODUCTION

The rapid advancement of digital technology has transformed educational practices across all disciplines, including language and literature education. In the era of Education 4.0, learning is expected not only to facilitate knowledge acquisition but also to develop critical thinking, creativity, communication, and digital literacy skills (Puncreobutr, 2021). Consequently, educational institutions are encouraged to integrate innovative technologies into classroom instruction to create meaningful, engaging, and student-centered learning experiences. Among various educational technologies, Augmented Reality (AR) has emerged as a promising tool for enhancing learning through the integration of virtual objects into real-world environments, enabling learners to visualize abstract concepts and interact with digital content in immersive ways (Akçayır & Akçayır, 2021). In language and literature education, the integration of technology remains relatively limited compared to science, engineering, and medical education. Literature learning, particularly poetry analysis, continues to rely heavily on traditional teaching approaches such as lectures, textual explanations, and teacher-centered interpretations (Fauzi & Suryani, 2024). Although these methods may support the transmission of literary knowledge, they often fail to facilitate deep engagement with poetic texts

or foster higher-order literary thinking. Poetry, by nature, contains symbolic language, figurative expressions, imagery, and emotional nuances that require learners to interpret abstract meanings beyond the literal level (Wiyatmi, 2022). Consequently, many students experience difficulties in understanding and analyzing poetic elements effectively. The challenge of poetry learning has become increasingly evident in secondary education. Recent literacy assessments indicate that students' reading comprehension and literary interpretation skills remain below expected standards. According to the Indonesian Ministry of Education, Culture, Research, and Technology, only a limited proportion of senior high school students demonstrate adequate proficiency in critical reading and literary interpretation (Kemendikbudristek, 2023). Similar findings have been reported internationally, where students frequently struggle to identify themes, symbolism, imagery, and figurative language in literary texts (Beach et al., 2022). These difficulties often result in superficial interpretations and reduced appreciation of literary works.

The complexity of poetry analysis stems from its multidimensional nature. Students are required to examine both physical elements, such as diction, imagery, rhyme, rhythm, and typography, and inner elements, including theme, tone, feeling, and message. Such analytical processes involve higher-order cognitive skills, particularly analysis, evaluation, and interpretation, as described in the revised Bloom's Taxonomy (Anderson & Krathwohl, 2001). However, many students remain at the concrete operational level of thinking and encounter challenges when attempting to understand abstract literary concepts. As a result, conventional instructional methods frequently fail to bridge the gap between concrete experiences and abstract literary understanding.

The importance of concrete learning experiences has long been emphasized by educational theorists. Edgar Dale's Cone of Experience suggests that learners develop deeper understanding when abstract concepts are connected to concrete and visual experiences (Dale, 1969). Similarly, constructivist learning theory argues that knowledge is actively constructed through meaningful interactions with learning environments and experiences (Piaget, 1977; Vygotsky, 1978). Therefore, educational technologies capable of visualizing abstract concepts may significantly enhance students' comprehension and engagement in poetry learning.

Augmented Reality offers unique pedagogical affordances for addressing these challenges. AR technology overlays digital information, including three-dimensional objects, animations, audio, and multimedia content, onto real-world environments in real time (Billinghurst et al., 2021). Unlike Virtual Reality, which replaces physical reality entirely, AR enriches learners' existing environments with contextual digital representations. In educational settings, AR has been shown to improve learning motivation, engagement, conceptual understanding, and knowledge retention across various disciplines (Ibáñez & Delgado-Kloos, 2022; Garzón et al., 2023).

Recent studies have demonstrated the effectiveness of AR in science education, engineering training, medical instruction, and language learning. For instance, Garzón et al. (2023) found that AR significantly improved students' academic achievement and motivation across multiple educational contexts. Likewise, Akçayır and Akçayır (2021) reported that AR enhanced learners' spatial understanding, conceptual visualization, and collaborative learning experiences. In language learning, AR applications have been used successfully to improve vocabulary acquisition, reading comprehension, and communicative competence (Chen & Hsu, 2022). However, the application of AR in literature education remains underexplored, particularly regarding poetry analysis.

Several researchers have highlighted the potential of AR to support literary learning by providing visual and interactive representations of literary concepts. Santos et al. (2023) argued that AR environments can transform literary texts into immersive learning experiences, enabling students to interact with symbolic and metaphorical elements in meaningful ways. Similarly, Papagiannis (2024) emphasized that AR can facilitate embodied literary experiences by allowing learners to construct personal interpretations through spatial and visual exploration. Nevertheless, empirical studies focusing specifically on AR-supported poetry analysis remain scarce.

The preliminary investigation conducted at SMA Negeri 1 Paranginan revealed similar challenges in poetry learning. Classroom observations and interviews with Indonesian language teachers indicated that students experienced considerable difficulties in analyzing both physical and inner elements of poetry. Although students were generally able to identify surface-level features such as diction and rhyme, they struggled to interpret deeper elements, including theme, tone, atmosphere, and moral messages. Assessment records showed that the average achievement score in poetry analysis was 62, considerably below the school's minimum competency criterion of 72. These findings suggest the need for innovative instructional interventions capable of facilitating deeper literary understanding. The limitations of existing instructional media further exacerbate this problem. Most poetry lessons rely on textbooks, PowerPoint presentations, and verbal explanations, which provide limited support for visualizing abstract poetic concepts. As a result, students often perceive poetry as difficult, boring, and irrelevant to their daily lives. Such perceptions negatively affect motivation and learning engagement, ultimately reducing academic achievement. Therefore, the development of interactive and immersive learning media is necessary to support

students' literary analysis skills. Despite growing interest in AR-based learning, several research gaps remain. First, most AR studies focus on science, technology, engineering, and mathematics (STEM) education, while literature education receives relatively little attention. Second, previous studies primarily examine learning achievement and motivation, with limited emphasis on literary analysis skills. Third, few studies investigate how AR can visualize abstract poetic elements and facilitate deeper literary interpretation. Finally, existing AR research rarely integrates constructivist learning principles and literary analysis frameworks into a comprehensive instructional design.

To address these gaps, this study develops an Augmented Reality-based poetry learning medium designed specifically to support literary analysis among senior high school students. The developed AR application visualizes abstract poetic elements through interactive three-dimensional representations, animations, audio narration, and contextual multimedia content. By transforming symbolic and metaphorical expressions into concrete visual experiences, the media aims to facilitate deeper understanding, engagement, and literary appreciation.

The novelty of this study lies in three aspects. First, it introduces an AR-based instructional environment specifically designed for poetry analysis, an area that remains largely unexplored in educational technology research. Second, the developed media integrates visualization of both physical and inner poetic elements, enabling students to analyze complex literary structures through multimodal experiences. Third, the study evaluates the validity, practicality, and effectiveness of AR learning media in enhancing literary analysis skills, thereby contributing empirical evidence to the growing body of research on immersive learning technologies.

Based on these considerations, the objectives of this study are: (1) to develop Augmented Reality-based poetry learning media for senior high school students; (2) to examine the validity of the developed media through expert evaluation; (3) to determine its practicality based on student responses; and (4) to evaluate its effectiveness in enhancing students' literary analysis skills. The findings are expected to contribute to the advancement of educational technology, particularly in literature learning, while providing practical guidance for teachers seeking innovative approaches to poetry instruction.

LITERATURE REVIEW

Constructivist Learning Theory

Constructivism serves as one of the most influential theoretical foundations in contemporary education. The theory posits that knowledge is actively constructed by learners through interaction with their environment rather than passively received from teachers (Piaget, 1977). Learning occurs when individuals integrate new experiences into existing cognitive structures, allowing them to develop deeper conceptual understanding. According to Piaget (1977), cognitive development results from the processes of assimilation and accommodation, through which learners continuously adapt their mental models.

Vygotsky (1978) further expanded constructivist perspectives by emphasizing the social nature of learning. His concept of the Zone of Proximal Development (ZPD) suggests that learners can achieve higher levels of understanding when supported through social interaction and instructional scaffolding. Learning technologies that provide meaningful experiences and collaborative opportunities can therefore facilitate knowledge construction and cognitive growth.

In literature education, constructivism implies that students should actively engage with literary texts to construct personal interpretations and meanings. Poetry analysis is not merely the identification of textual elements but an interpretive process involving reflection, inference, and meaning-making. Students develop literary understanding by connecting textual features with prior knowledge, emotions, and cultural experiences (Beach et al., 2022). Consequently, instructional media should support exploration, interpretation, and interaction rather than simple information delivery.

Augmented Reality (AR) aligns strongly with constructivist principles because it enables learners to interact directly with learning objects within authentic contexts. Through AR, students can manipulate virtual representations, explore relationships among concepts, and construct understanding through experiential learning (Ibáñez & Delgado-Kloos, 2022). Therefore, constructivism provides an appropriate theoretical foundation for the development of AR-based poetry learning media.

Cognitive Theory of Multimedia Learning

The Cognitive Theory of Multimedia Learning (CTML), developed by Mayer (2021), explains how individuals learn more effectively from words and images than from words alone. The theory is based on three assumptions: dual channels, limited capacity, and active processing. The dual-channel assumption suggests that learners process verbal and visual information through separate cognitive systems. The limited-capacity assumption

states that working memory can process only a small amount of information at a given time. Meanwhile, active processing refers to learners' efforts to select, organize, and integrate information into meaningful knowledge structures. Mayer (2021) argues that effective multimedia learning occurs when instructional materials are designed according to evidence-based principles. These principles include coherence, signaling, redundancy, spatial contiguity, temporal contiguity, segmentation, modality, and personalization. Learning materials that adhere to these principles can reduce extraneous cognitive load while promoting meaningful learning.

The relevance of CTML to poetry learning is particularly significant. Poetry often contains abstract concepts, symbolic language, and figurative expressions that are difficult for students to visualize. Traditional text-based instruction may place excessive cognitive demands on learners because they must simultaneously decode language and construct mental imagery. AR technology addresses this challenge by providing visual representations of abstract poetic concepts, thereby reducing cognitive load and facilitating comprehension. For example, metaphors, imagery, and symbolic expressions can be represented through interactive three-dimensional models, animations, and audio explanations. Such multimodal representations allow learners to process information through both verbal and visual channels, leading to deeper understanding and improved retention. Consequently, CTML provides a strong theoretical rationale for integrating AR into poetry instruction.

Edgar Dale's Cone of Experience

Edgar Dale's Cone of Experience remains one of the most widely cited frameworks for understanding the relationship between instructional experiences and learning effectiveness. Dale (1969) proposed that learning experiences range from highly abstract forms, such as verbal symbols, to highly concrete experiences involving direct interaction with real objects and events. According to Dale, learners retain information more effectively when instruction incorporates concrete and multisensory experiences. Abstract representations, including written texts, require learners to construct meaning independently, whereas concrete experiences facilitate comprehension by providing direct sensory engagement. Although poetry is inherently abstract, effective instructional design can bridge the gap between symbolic language and concrete understanding.

The application of AR technology corresponds closely with Dale's framework. AR transforms textual and symbolic representations into visual, auditory, and interactive experiences. Through three-dimensional visualization, students can observe and manipulate representations of poetic imagery, symbols, and themes, making abstract literary concepts more accessible. This process supports deeper cognitive engagement and facilitates the transition from concrete experiences to abstract interpretation. In the context of poetry analysis, AR serves as an instructional bridge that enables learners to move beyond rote identification of literary elements toward meaningful interpretation and appreciation. Therefore, Dale's Cone of Experience provides a valuable pedagogical justification for using AR in literature education.

Augmented Reality in Education

Augmented Reality refers to a technology that overlays digital information onto real-world environments, enabling users to interact simultaneously with physical and virtual objects (Billinghurst et al., 2021). Unlike Virtual Reality, which immerses users in fully artificial environments, AR enhances reality by integrating computer-generated elements into real-world settings. Recent advancements in mobile technologies have expanded the accessibility and educational applications of AR. According to Garzón et al. (2023), AR has demonstrated positive effects on learning achievement, motivation, engagement, and conceptual understanding across various educational domains. Similarly, Akçayır and Akçayır (2021) reported that AR facilitates visualization, supports experiential learning, and increases student participation.

The pedagogical value of AR lies in its ability to create immersive and contextualized learning experiences. AR enables learners to interact with digital content within meaningful contexts, promoting inquiry, exploration, and collaborative learning (Dunleavy & Dede, 2022). Furthermore, AR supports situated learning by connecting instructional content with authentic environments and experiences. In language education, AR has been used to improve vocabulary acquisition, reading comprehension, pronunciation, and language engagement (Chen & Hsu, 2022). However, the integration of AR into literature learning remains relatively limited. Existing studies have primarily focused on linguistic competencies rather than literary interpretation and appreciation. Santos et al. (2023) argue that AR can transform literary texts into interactive experiences by enabling learners to visualize narrative structures, literary symbols, and thematic relationships. Through immersive interaction, students become active participants in meaning construction rather than passive recipients of textual information. Consequently, AR offers considerable potential for enhancing literary learning outcomes.

Literary Analysis Skills in Poetry Learning

Literary analysis refers to the process of examining, interpreting, and evaluating literary texts to understand their meanings, structures, and aesthetic qualities (Wiyatmi, 2022). In poetry learning, literary analysis involves the identification and interpretation of both physical and inner elements. Physical elements include diction, imagery, figurative language, rhyme, rhythm, and typography. These elements contribute to the aesthetic structure of a poem and influence readers' interpretations. Inner elements include theme, tone, feeling, and message, which represent deeper layers of meaning embedded within the text (Sayuti, 2021).

The analysis of poetry requires higher-order thinking skills because students must move beyond literal comprehension toward interpretation and evaluation. According to Anderson and Krathwohl (2001), literary analysis primarily involves cognitive processes at the levels of analyzing, evaluating, and creating. Students must identify textual features, establish relationships among elements, infer meanings, and formulate interpretations supported by evidence. Research indicates that many students experience difficulties in literary analysis due to the abstract nature of poetic language (Fauzi & Suryani, 2024). Challenges often arise when learners attempt to interpret symbolism, metaphors, and emotional expressions. Consequently, instructional strategies that support visualization and contextualization may improve students' analytical abilities.

AR-based learning environments can facilitate literary analysis by providing multimodal representations of poetic elements. Visualizing imagery, symbols, and themes enables students to explore literary meanings more concretely while maintaining opportunities for interpretation and reflection. Therefore, AR may serve as an effective instructional tool for developing literary analysis skills.

Learning Engagement and Technology-Enhanced Literature Learning

Learning engagement refers to the degree of behavioral, emotional, and cognitive involvement that students demonstrate during learning activities (Fredricks et al., 2023). High levels of engagement are associated with increased motivation, academic achievement, persistence, and satisfaction. Technology-enhanced learning environments have been shown to promote engagement by incorporating interactive features, multimedia resources, and personalized learning experiences (Bond et al., 2024). AR technology is particularly effective because it combines novelty, immersion, and interactivity, which stimulate curiosity and active participation. In literature education, engagement is essential because literary interpretation requires sustained attention, emotional investment, and reflective thinking. Students who are actively engaged with literary texts are more likely to develop appreciation, empathy, and critical thinking skills. Therefore, AR-supported poetry learning may enhance engagement by transforming reading activities into immersive and exploratory experiences.

Conceptual Framework

This study is grounded in the integration of Constructivist Learning Theory, Cognitive Theory of Multimedia Learning, and Edgar Dale's Cone of Experience. These theories collectively suggest that meaningful learning occurs when students actively construct knowledge through concrete, multimodal, and interactive experiences. The proposed framework assumes that AR-based poetry learning media can visualize abstract poetic elements through interactive multimedia representations. Such visualization enhances learning engagement, reduces cognitive load, and facilitates knowledge construction. As a result, students develop stronger literary analysis skills and achieve higher learning outcomes. Accordingly, this study hypothesizes that the implementation of AR-based poetry learning media will positively influence students' literary analysis skills by improving comprehension, engagement, and interpretation of poetic texts

METHOD

Research Design

This study employed a Research and Development (R&D) approach to develop and evaluate Augmented Reality (AR)-based poetry learning media designed to enhance students' literary analysis skills. The study adopted the ADDIE instructional design model developed by Branch (2009), consisting of five systematic phases: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was selected because it provides a comprehensive framework for designing, developing, validating, implementing, and evaluating educational products systematically and effectively. The research focused on producing an AR-based learning medium capable of visualizing abstract poetic elements, including imagery, symbolism, theme, tone, feeling, and message through interactive three-dimensional objects, animations, audio narration, and multimedia features. The quality of the developed product was evaluated based on three criteria: validity, practicality, and effectiveness.

Research Setting and Participants

The study was conducted at SMA Negeri 1 Paranginan, North Sumatra, Indonesia, during the 2025/2026 academic year. The participants consisted of Grade X students enrolled in Indonesian Language courses, particularly in the topic of poetry analysis. The implementation phase involved two classes: Experimental Group: 36 students learning through AR-based poetry learning media. Control Group: 36 students learning through conventional instructional media, including PowerPoint presentations and YouTube videos. In addition, expert validators participated in the validation process, consisting of: Two material experts specializing in Indonesian language and literature education; Two instructional design experts specializing in educational technology; and Two media experts specializing in multimedia and digital learning development. The expert validators were responsible for evaluating the quality and appropriateness of the developed media before classroom implementation.

Development Procedure

The development process followed the five stages of the ADDIE model: (1) **Analysis Phase**. The analysis phase aimed to identify instructional problems, learner characteristics, curriculum requirements, and learning needs. Several activities were conducted: Curriculum analysis based on the Merdeka Curriculum for Grade X Indonesian Language; Analysis of learning outcomes related to poetry analysis competencies; Classroom observations; Teacher interviews; and Student needs assessment. The findings revealed that students experienced difficulties in analyzing abstract poetic elements, particularly theme, tone, feeling, symbolism, and moral messages. Existing instructional media were unable to provide concrete visual representations of these concepts; (2) **Design Phase**. Based on the results of the analysis phase, instructional and media designs were developed. The design activities included: Formulating learning objectives; Designing AR learning scenarios; Developing storyboards; Designing user interfaces; Creating assessment instruments; and Designing literary analysis learning activities. The AR content was designed using Assemblr Edu, which allows the integration of 3D objects, animations, audio narration, videos, and interactive markers; (3) **Development Phase**.

The development phase focused on producing the AR learning media. The development activities included: Creating AR markers; Developing 3D visualizations; Producing audio narrations; Integrating multimedia components; and Programming interactive learning activities. The prototype was subsequently evaluated by experts through validation procedures. Suggestions and feedback from validators were used to revise and improve the product before implementation; (4) **Implementation Phase**. The revised AR learning media was implemented in classroom instruction. Students in the experimental group learned poetry analysis using AR media, while students in the control group received conventional instruction. The implementation lasted for six instructional meetings. Learning activities included: Scanning AR markers; Exploring virtual poetry representations; Analyzing literary elements; Group discussions; and Reflective learning activities; and (5) **Evaluation Phase**. Evaluation was conducted continuously throughout the development process. Both formative and summative evaluations were performed. Formative evaluation occurred during expert validation and small-scale trials. Summative evaluation was conducted during classroom implementation to examine the effectiveness of the AR media in improving literary analysis skills.

Research Instruments

Several instruments were employed to collect research data: (1) **Expert Validation Instruments**. Validation instruments were used to evaluate the quality of the developed media. The instruments assessed: Content accuracy; Curriculum alignment; Learning design quality; Interface design; Interactivity; and Technical functionality. Responses were measured using a five-point Likert scale; (2) **Student Response Questionnaire**. The practicality of the media was measured through student response questionnaires. The questionnaire consisted of indicators related to: Ease of use; Attractiveness; Interactivity; Learning motivation; and User satisfaction; (3) **Literary Analysis Skills Test**. A literary analysis skills test was developed to measure students' achievement. The test assessed students' ability to: Identify poetic elements; Analyze imagery; Interpret symbolism; Analyze themes; Interpret tone and feeling; and Evaluate poetic meaning. The test consisted of essay and analytical response items; (4) **Observation Sheet**. Observation sheets were used to evaluate student participation and engagement during learning activities. Indicators included: Learning participation; Collaboration; Attention; Interaction; and Learning enthusiasm.

Data Collection Techniques

Data were collected using multiple techniques: Expert validation; Questionnaires; Observation; Pretest; and Posttest. The combination of quantitative and qualitative data collection methods enabled comprehensive evaluation of the developed product.

Data Analysis Techniques

Validity Analysis. The validity of the developed media was analyzed using Aiken’s V.

Table 1. The validity categories were

Aiken's V	Category
> 0.80	Very Valid
0.60–0.79	Valid
< 0.60	Less Valid

Reliability Analysis. Instrument reliability was calculated using Cronbach’s Alpha.

Table 2. Practicality data were analyzed using percentage scores

Percentage	Category
81–100%	Very Practical
61–80%	Practical
41–60%	Fair
<40%	Poor

Effectiveness Analysis. The effectiveness of AR learning media was analyzed through.

Table 3. Normalized Gain (N-Gain) and Categories

N-Gain	Category
>0.70	High
0.30–0.70	Moderate
<0.30	Low

Independent Samples t-Test

The t-test was conducted to compare literary analysis skill scores between experimental and control groups at a significance level of 0.05. Decision criteria: $p < 0.05$ = Significant difference and $p > 0.05$ = No significant difference

Effect Size (Cohen’s d)

Table 4. Interpretation

Cohen’s d	Effect
0.20	Small
0.50	Medium
0.80	Large

The effectiveness of the AR learning media was determined based on statistically significant improvements in literary analysis skills, N-Gain scores, and effect size results.

RESULTS AND DISCUSSION

Results

Needs Analysis Findings

The needs analysis was conducted through classroom observations, interviews with Indonesian language teachers, and student questionnaires at SMA Negeri 1 Paranginan. The results indicated that students experienced considerable difficulties in analyzing poetry, particularly in interpreting abstract poetic elements such as theme, tone, symbolism, imagery, and message. The preliminary assessment showed that the average score of students’ literary analysis skills was only 62.00, which was below the minimum mastery criterion (72.00). Furthermore, 71% of

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students reported that poetry lessons were difficult to understand because the instructional materials relied mainly on textbooks and teacher explanations.

Table 5. Students' Needs Analysis Results

Indicator	Percentage (%)
Difficulty understanding imagery	83.3
Difficulty interpreting symbolism	86.1
Difficulty identifying theme	80.6
Difficulty understanding tone	77.8
Need for visual learning media	91.7
Interest in AR-based learning	94.4

The findings confirmed the necessity of developing innovative learning media capable of visualizing abstract poetic concepts.

Product Development Results

The developed product was an Augmented Reality-Based Poetry Learning Media created using Assemblr Edu. The application integrated: AR markers, Three-dimensional visualization, Interactive poetry exploration, Audio narration, Learning worksheets, Literary analysis exercises, Performance assessment, and The AR media consisted of five learning modules:

Table 6. Learning Modules of AR-Based Poetry Media

Module	Content
Module 1	Introduction to Poetry
Module 2	Physical Elements of Poetry
Module 3	Inner Elements of Poetry
Module 4	Poetry Interpretation
Module 5	Literary Analysis Practice

Students scanned AR markers using smartphones to access interactive 3D visualizations representing poetic imagery, symbolism, atmosphere, and thematic structures.

Expert Validation Results

Material Expert Validation. Material validation focused on content accuracy, curriculum alignment, literary concepts, and instructional relevance.

Table 7. Material Expert Validation Results

Aspect	Score (%)	Category
Content Accuracy	82.5	Very Valid
Curriculum Alignment	79.2	Valid
Literary Concepts	81.7	Very Valid
Language Clarity	78.9	Valid
Learning Objectives	80.8	Very Valid
Average	80.6	Very Valid

The results indicate that the content was highly appropriate for poetry instruction.

Instructional Design Validation

Table 8. Instructional Design Validation Results

Aspect	Score (%)	Category
Learning Objectives	94.0	Very Valid
Learning Activities	92.5	Very Valid
Student Engagement	91.3	Very Valid
Assessment Design	90.7	Very Valid
Instructional Flow	91.6	Very Valid
Average	92.0	Very Valid

Media Expert Validation

Table 9. Media Expert Validation Results

Aspect	Score (%)	Category
Interface Design	89.4	Very Valid
Navigation	87.5	Very Valid
Interactivity	90.0	Very Valid
Graphic Quality	86.8	Very Valid
Technical Functionality	87.8	Very Valid
Average	88.3	Very Valid

Practicality Results

Individual Trial. The individual trial involved three students representing high, medium, and low academic achievement.

Table 10. Individual Trial Results

Aspect	Percentage (%)	Category
Ease of Use	87.2	Very Practical
Attractiveness	85.6	Very Practical
Interactivity	86.4	Very Practical
Learning Support	85.7	Very Practical
Average	86.2	Very Practical

Small Group Trial. Nine students participated in the small-group trial.

Table 11. Small Group Trial Results

Aspect	Percentage (%)	Category
Ease of Use	88.6	Very Practical
Attractiveness	89.1	Very Practical
Interactivity	87.8	Very Practical
Learning Support	88.2	Very Practical
Average	88.4	Very Practical

Field Trial. Thirty-six students participated in the field trial.

Table 12. Field Trial Results

Aspect	Percentage (%)	Category
Ease of Use	91.2	Very Practical
Attractiveness	89.8	Very Practical
Interactivity	90.5	Very Practical
Learning Support	88.9	Very Practical
Average	90.1	Very Practical

The practicality findings indicate that students perceived the AR media as engaging, user-friendly, and helpful for understanding poetry.

Effectiveness Results

Pretest and Posttest Scores

Table 13. Descriptive Statistics of Literary Analysis Skills

Group	N	Pretest Mean	Posttest Mean
Experimental	36	61.83	83.11
Control	36	62.14	76.08

The experimental group showed greater improvement than the control group.

N-Gain Analysis

Table 14. N-Gain Results

Group	N-Gain	Category
Experimental	0.56	Moderate
Control	0.37	Moderate

The experimental group demonstrated a substantially higher gain score.

Independent Samples t-Test

Table 15. Independent Samples t-Test Results

Variable	t-value	Sig. (2-tailed)
Literary Analysis Skills	4.871	0.000

Because $p < 0.05$, a statistically significant difference existed between students learning with AR media and those receiving conventional instruction.

Effect Size Analysis

Table 16. Cohen's d Effect Size

Variable	Effect Size (d)	Category
Literary Analysis Skills	0.85	Large

The large effect size indicates that AR-based learning media produced substantial educational impact.

Improvement of Literary Analysis Skills. The AR media significantly improved students' abilities to analyze poetic elements.

Table 17. Improvement by Literary Analysis Indicator

Indicator	Pretest	Posttest
Identifying Imagery	60.4	84.3
Analyzing Diction	63.2	82.6
Interpreting Symbolism	58.8	81.5
Identifying Theme	62.7	84.7
Analyzing Tone	61.3	83.8
Interpreting Message	64.5	81.9

The greatest improvement occurred in interpreting symbolism and imagery, indicating that AR visualization effectively transformed abstract poetic concepts into concrete learning experiences.

Summary of Findings

The findings demonstrate that the developed Augmented Reality-Based Poetry Learning Media successfully met all product quality criteria: (1) The media was highly valid according to material experts (80.6%), instructional design experts (92.0%), and media experts (88.3%); (2) The media was highly practical, obtaining an average practicality score of 90.1% during field implementation; (3) The media was effective in enhancing students' literary

analysis skills, as evidenced by: Higher posttest scores (83.11 vs. 76.08); Higher N-Gain scores (0.56 vs. 0.37); Significant t-test results ($p < .001$); and Large effect size ($d = 0.85$). These results indicate that AR-based poetry learning media is a valid, practical, and effective instructional innovation for improving literary analysis skills among senior high school students.

Discussion

The findings of this study demonstrate that the developed Augmented Reality (AR)-Based Poetry Learning Media met the criteria of validity, practicality, and effectiveness in enhancing students' literary analysis skills. The results support the proposition that immersive and interactive learning technologies can facilitate deeper understanding of abstract literary concepts while simultaneously increasing students' engagement and motivation in literature learning. These findings are consistent with constructivist learning theory, multimedia learning theory, and contemporary research on technology-enhanced learning.

Validity of the Developed AR-Based Poetry Learning Media

The expert validation results showed that the developed media achieved a very high level of validity, with material validation reaching 80.6%, instructional design validation 92.0%, and media validation 88.3%. These findings indicate that the product successfully integrates pedagogical principles, literary content, and technological features into a coherent learning environment. The high validity score can be attributed to the systematic development process based on the ADDIE model. According to Branch (2009), instructional products developed through systematic design procedures tend to exhibit stronger alignment between learning objectives, content organization, instructional strategies, and assessment mechanisms. In the present study, each stage of development was guided by curriculum requirements and learners' needs, ensuring that the final product addressed actual instructional challenges encountered in poetry learning.

The findings are consistent with previous educational technology studies conducted by Mursid and colleagues. Mursid, Saragih, and Hartono (2022) reported that technology-supported learning environments designed through systematic instructional planning significantly improved learning quality and student achievement. Their study emphasized the importance of integrating multimedia and project-based learning components to enhance meaningful learning experiences. Likewise, the current AR-based poetry media demonstrates that carefully designed digital learning environments can facilitate deeper conceptual understanding and active student participation. Furthermore, the validity findings support Mayer's Cognitive Theory of Multimedia Learning, which suggests that instructional materials become more effective when verbal and visual information are integrated meaningfully. The AR media developed in this study visualized abstract poetic concepts through three-dimensional representations, audio narration, animations, and interactive activities. Such integration enabled learners to process information through multiple cognitive channels, thereby improving comprehension and reducing cognitive overload.

Practicality of AR-Based Poetry Learning Media

The practicality evaluation revealed highly positive student responses, with field trial scores reaching 90.1%. Students reported that the AR media was easy to use, attractive, interactive, and helpful in understanding poetry. These findings suggest that AR technology can create engaging learning experiences that encourage active participation and sustained attention. One of the primary challenges in literature learning is students' perception that poetry is difficult, abstract, and disconnected from everyday experiences. The present study demonstrates that AR can overcome these barriers by transforming symbolic literary elements into concrete visual experiences. Through smartphone-based interactions, students could explore poetic imagery, symbolism, and thematic structures in immersive ways that were previously unavailable through conventional instructional media.

These findings correspond with previous studies emphasizing the role of technology in promoting student engagement. Mursid, Muslim, and Fariyah (2023) found that collaborative e-learning environments significantly improved student participation, motivation, and learning engagement through interactive digital resources. Their findings highlighted the importance of learner-centered instructional designs that encourage exploration, collaboration, and problem-solving. Similarly, the AR media developed in this study encouraged students to become active participants in literary interpretation rather than passive recipients of information. The practicality results also align with Dale's Cone of Experience, which suggests that learning becomes more meaningful when students engage in concrete and multisensory experiences. Traditional poetry instruction often relies heavily on verbal explanations and textual analysis, whereas AR provides visual and interactive representations that make abstract concepts more accessible. Consequently, students perceive learning activities as more enjoyable and relevant.

Moreover, the positive student responses indicate that AR technology can enhance learners' intrinsic motivation. Previous research has shown that immersive technologies stimulate curiosity, increase attention, and foster sustained engagement (Garzón et al., 2023). In the present study, students expressed enthusiasm toward exploring AR visualizations and participating in literary discussions, suggesting that AR may contribute to more positive attitudes toward literature learning.

Effectiveness in Enhancing Literary Analysis Skills

The effectiveness analysis demonstrated that students who learned through AR-based media achieved significantly higher literary analysis skills than those receiving conventional instruction. The experimental group obtained a mean posttest score of 83.11, compared with 76.08 in the control group. Furthermore, the N-Gain score of 0.56 and Cohen's *d* value of 0.85 indicate substantial educational impact. These findings provide strong evidence that AR-based learning environments can facilitate higher-order thinking processes required for literary analysis. Poetry interpretation involves complex cognitive activities, including identifying relationships among textual elements, interpreting symbolism, evaluating themes, and constructing personal meanings. Such processes correspond to the higher levels of Bloom's revised taxonomy, namely analysis, evaluation, and creation.

The significant improvement in literary analysis skills can be explained through constructivist learning theory. According to Piaget (1977) and Vygotsky (1978), knowledge is actively constructed through interaction with learning environments and meaningful experiences. The AR media allowed students to interact directly with representations of poetic concepts, thereby supporting active knowledge construction. Instead of memorizing literary terminology, students engaged in exploratory and interpretive learning activities that facilitated deeper understanding. These results are also supported by the findings of Halimatussa'diah, Sitompul, and Mursid (2024), who reported that innovative learning models emphasizing collaboration, critical reflection, and active participation significantly improved student learning outcomes. Their Synergy Learning Model encouraged learners to engage in planning, collaboration, and reflective thinking processes that promoted deeper conceptual understanding. Similarly, the AR-based poetry learning environment facilitated collaborative interpretation and reflective analysis, which contributed to students' improved performance.

Another important finding concerns the improvement of specific literary analysis indicators. The largest gains occurred in interpreting symbolism and imagery, two areas that students traditionally find difficult because of their abstract nature. The visualization capabilities of AR technology appear particularly effective in addressing this challenge. Through three-dimensional representations and contextual animations, students could observe visual analogies of poetic symbols and imagery, making interpretation more concrete and meaningful. These findings are consistent with research on multimedia learning, which demonstrates that visual representations enhance comprehension of abstract concepts by reducing cognitive demands and supporting mental model construction. The ability of AR to combine textual, visual, and auditory information provides learners with richer cognitive scaffolds for understanding complex literary meanings.

The Role of AR in Transforming Literature Learning

The present findings contribute to the growing body of literature highlighting the transformative potential of AR in education. While AR has been widely applied in science, engineering, and medical education, its application in literature learning remains relatively limited. This study provides empirical evidence that AR can be effectively integrated into poetry instruction to support literary analysis and appreciation. The transformation occurs because AR changes the nature of literary learning from passive reading to active exploration. Traditional literature instruction often positions students as recipients of teacher interpretations, whereas AR enables learners to construct their own interpretations through interaction and discovery. This shift reflects contemporary educational paradigms emphasizing learner autonomy, inquiry, and active participation.

The findings further support the argument that emerging technologies should not merely digitize existing instructional practices but should create fundamentally new learning experiences. In the present study, AR did not simply present poetry in digital format; rather, it transformed abstract literary concepts into immersive learning experiences that would be impossible through conventional media. This conclusion resonates with the findings of Mursid et al. (2025), who demonstrated that mobile technology-based learning models can significantly improve learning outcomes when instructional design effectively integrates technology, pedagogy, and content knowledge. Their Mobile CAP model emphasized learner autonomy, active problem-solving, and technology-enhanced interaction as key mechanisms for improving educational effectiveness. The AR-based poetry learning media

developed in this study reflects similar principles by integrating immersive technology with meaningful literary learning activities.

Novelty and Contribution of the Study

The primary novelty of this study lies in the development of an AR-based instructional environment specifically designed for poetry analysis. Previous AR studies have predominantly focused on STEM disciplines, language acquisition, and vocational training. Few studies have investigated how AR can support literary interpretation and appreciation. This study contributes to educational technology research in three important ways. First, it demonstrates that AR can effectively visualize abstract poetic elements such as imagery, symbolism, theme, and tone. Second, it provides empirical evidence regarding the validity, practicality, and effectiveness of AR-based literature learning media. Third, it extends constructivist and multimedia learning theories into the context of literary education, illustrating how immersive technologies can facilitate higher-order literary thinking.

The findings also have practical implications for teachers and curriculum developers. Literature educators may consider integrating AR technologies into instructional practices to enhance engagement, comprehension, and analytical skills. Furthermore, educational institutions should provide professional development opportunities enabling teachers to design and implement technology-enhanced literary learning environments effectively. Overall, the findings indicate that AR-based poetry learning media offers a promising instructional innovation capable of transforming literature education. By bridging the gap between abstract literary concepts and concrete learning experiences, AR can support deeper literary understanding while fostering engagement, creativity, and critical thinking among senior high school students.

CONCLUSION

This study successfully developed and validated an Augmented Reality (AR)-Based Poetry Learning Media designed to enhance literary analysis skills among senior high school students. The development process followed the ADDIE model, encompassing the stages of Analysis, Design, Development, Implementation, and Evaluation. The resulting product integrates interactive three-dimensional visualizations, audio narration, multimedia content, and literary analysis activities that transform abstract poetic concepts into meaningful learning experiences. The validation results demonstrated that the developed media met high-quality standards. Material experts rated the product at 80.6%, instructional design experts at 92.0%, and media experts at 88.3%, indicating that the media is highly valid and appropriate for poetry instruction. Practicality testing further revealed positive student perceptions, with field trial results reaching 90.1%, suggesting that the AR-based learning media is user-friendly, engaging, and supportive of learning activities.

The effectiveness evaluation confirmed that the AR-based poetry learning media significantly improved students' literary analysis skills. Students in the experimental group achieved a higher posttest mean score (83.11) compared to those in the control group (76.08). The N-Gain score of 0.56 indicated a moderate improvement, while the independent-samples t-test revealed a statistically significant difference between groups ($p < .05$). Furthermore, the large effect size (Cohen's $d = 0.85$) demonstrated a substantial educational impact of the intervention. The novelty of this study lies in the integration of Augmented Reality technology into poetry learning, particularly for visualizing abstract poetic elements such as imagery, symbolism, theme, tone, and message. Unlike previous AR studies that predominantly focused on STEM disciplines, this research extends the application of immersive learning technologies to literature education and literary analysis. Overall, the findings indicate that AR-based poetry learning media is valid, practical, and effective for improving literary analysis skills. The study contributes both theoretically and practically to educational technology and literature learning by providing an innovative instructional approach capable of enhancing student engagement, comprehension, critical interpretation, and appreciation of poetry in the digital learning era.

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