



RESEARCH ARTICLE

**PEDAGOGICAL INNOVATION WITH AUGMENTED REALITY IN FOLK POETRY EDUCATION: A TOOL FOR RECONSTRUCTING LOCAL WISDOM THROUGH IMMERSIVE LEARNING**Yosi Wulandari^{1*}, M. Ardi Kurniawan², Denik Wirawati³, Hari Adi Rahmad⁴,^{1,2,3} Universitas Ahmad Dahlan, Yogyakarta, Daerah Istimewa Yogyakarta Indonesia⁴ Universitas Bung Hatta, Padang, Sumatera Barat, Indonesia**Article History**

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ABSTRACT

This study presents a systematic literature review (SLR) on the integration of Augmented Reality (AR) in folk poetry education from 2019 to 2024. Although AR is increasingly prominent in STEM fields, its application in the humanities, especially literary instruction and cultural heritage preservation, remains limited. As an oral and symbolic form of intangible heritage, folk poetry presents pedagogical challenges related to abstraction, generational gaps, and cultural disconnection. Using the PRISMA framework, 94 Scopus-indexed publications were screened, resulting in 16 peer-reviewed articles for full analysis, focusing on trends, pedagogical strategies, and cultural dimensions of AR-based poetry learning. Findings indicate that AR enhances comprehension of symbolic language, fosters cultural empathy, and promotes multisensory learning through interactive visualizations, while revitalizing oral traditions by linking digital technologies with traditional narratives. However, challenges persist, including limited infrastructure, insufficient teacher readiness, and the lack of culturally adaptive AR content. These results underscore the need for future research integrating adaptive technologies, cultural sensitivity, and ethical considerations. Developing affordable, locally relevant AR tools has the potential to transform folk poetry instruction, particularly in Indonesia's Kurikulum Merdeka, by aligning cultural preservation with innovative pedagogy and 21st-century competencies.

Introduction

Rapid technological advancement demands that educators integrate innovative pedagogical strategies that cultivate students' critical, creative, and problem-solving skills. (Damşa et al., 2021; Granado-Alcón et al., 2020; Hofer et al., 2021; Sailer et al., 2021; Yilmaz, 2021; Zulu & Mudaly, 2023). However, challenges such as mastering complex content and effectively integrating technology persist (Fadli et al., 2020; Lee et al., 2014). The problem, like in higher education, requires educators and learners to respond creatively and innovatively to contemporary challenges (Lee et al., 2014; X. Liu et al., 2014; Atabek & Burak, 2020; Adhe et al., 2023). This effort must also ensure meaningful learning experiences for all participants (Atabek & Burak, 2020; Hofer et al., 2021; Toth et al., 2021; Zulu & Mudaly, 2023).

The independent curriculum emphasizes learning aligned with students' interests and abilities (Manalu et al., 2022; Susilawati, 2021), making technology an essential support for instructional goals (Ariessanti et al., 2021; Bakri et al., 2020; Rahma et al., 2021). Technology also increases learning appeal, motivation, and engagement (Lestari, 2018; Saputra, 2020; Adisel & Pranansa, 2020; An et al., 2020; Indarta et al., 2022; Sulisworo et al., 2021; Rahmat, Tiawati, et al., 2023; Hasanudin et al., 2024). Augmented Reality (AR), defined as real-world contexts overlaid with virtual information (Klopfer & Squire, 2008; Yilmaz Can et al., 2023), offers promising potential; however, despite broad adoption in STEM fields, its use in humanities and poetry learning remains underexplored, indicating a need for further research on AR's role in pedagogical innovation and cultural appreciation.

Literary learning contributes to character formation and Pancasila values (Sofiyana et al., 2021; Wincana et al., 2022; Hidayat et al., 2023; Rachman et al., 2024; Xuemei, 2025), with folk poetry serving as important

cultural heritage that embodies community values and collective wisdom. Its preservation is vital for cultural continuity and national identity, and it is even recognized globally in forms such as rhymes listed as world heritage (Heni & Subiyanto, 2021; Netra et al., 2023; Rahmi et al., 2025). However, poetry education remains challenging due to figurative language, historical context, and interpretive demands that reduce student engagement (Zulu & Mudaly, 2023). Abstract symbolism and culturally rooted meanings, traditionally transmitted orally, are difficult for contemporary learners with limited cultural exposure, widening intergenerational gaps and hindering comprehension (Y. Liu & Song, 2024; Juliati et al., 2025). These conditions underscore the need for innovative instructional approaches to make folk poetry more accessible and meaningful.

Augmented Reality (AR) offers a strategic solution for challenges in folk poetry learning by visualizing symbolic meanings and cultural contexts through immersive, multisensory experiences that strengthen engagement, empathy, and comprehension. Evidence from projects such as the I-Folk database shows that semantic technologies and visual media can enhance intergenerational transmission and learner interest in traditional arts (Fortuna et al., 2024; Lidiastuti & Suwono, 2024; Mkwizu & Bordoloi, 2024; Sánchez-Jara et al., 2023). This aligns with UNESCO's Convention for the Safeguarding of Intangible Cultural Heritage and Indonesia's Kurikulum Merdeka, which emphasize culturally responsive learning and Pancasila-based values. Thus, AR not only addresses pedagogical barriers but also supports cultural revitalization and identity formation by enabling students to explore concepts, contexts, and poetic elements interactively (Lee et al., 2014; Ozyurt & Ozyurt, 2024), positioning it as a relevant pathway for preserving heritage while preparing learners for a digital future.

Early AR scholarship established its educational potential by defining AR as a technology that overlays virtual information onto real-world environments (Azuma, 1997). Subsequent pedagogical frameworks positioned AR as a tool for inquiry-based, situated, and collaborative learning (Dunleavy & Dede, 2014; Klopfer & Squire, 2008). Research by Billinghurst et al. further demonstrated how AR's multimodal interactivity supports embodied cognition and contextual learning (Billinghurst et al., 2014). These foundations support recent adaptations of AR in literary education, extending immersive learning into the humanities and strengthening interpretive engagement with poetic symbolism.

Despite growing interest in AR-based learning, its application in folk poetry education remains limited, as research still centers on science and technical fields. At the same time, traditional literary and oral heritage is underexplored. Yet folk poetry, as intangible cultural heritage, carries ethical, historical, and philosophical values essential to national identity, making its relevance increasingly urgent in the post-pandemic shift toward technology-assisted and immersive learning (Adhe et al., 2024; Boboc et al., 2022; Criollo-C et al., 2024; Mendoza et al., 2023a; Phatai et al., 2024; Sulastri, 2025; Vashisht & Sharma, 2024). Although AR adoption has expanded in STEM (Irwanto et al., 2022; Maulana et al., 2024), literary integration remains fragmented, with existing efforts focused on museum visualization rather than curriculum-based instruction. Emerging initiatives in Malaysia, Indonesia, and West Africa show potential for heritage preservation and oral storytelling, but still lack adaptive, classroom-integrated, and learner-personalized designs needed for humanities-oriented AR development (Ramtohl & Khedo, 2024; Seifi et al., 2023).

The PARSAT model illustrates how adaptive AR systems can support personalized learning through fuzzy logic, though its application has been limited to engineering contexts (Papakostas et al., 2023). Comparable adaptive approaches for literary interpretation, particularly for navigating poetic symbolism, remain unexplored. Similarly, AI-integrated AR platforms for humanities education are still emerging, with scholars calling for context-sensitive and user-centered design (Nasirudin et al., 2024).

Ethical and cultural concerns emerge as AR digitizes intangible heritage, including issues of representation, consent, and cultural commodification; although culturally sensitive, community-based design frameworks exist, they remain scarcely applied (Ramtohl & Khedo, 2024). This reflects a research gap in developing adaptive, culturally grounded AR systems for folk poetry education, particularly in Southeast Asia and the Global South. Addressing this gap, the review examines recent AR developments in folk poetry learning and offers insights for revitalizing instruction, enhancing engagement, and supporting cultural preservation. Overall, AR integration presents new opportunities for meaningful literary learning that strengthens

creativity, cultural awareness, and critical thinking in the digital era. Based on the background described above, a clearer rationale for conducting this review is necessary.

Although AR is increasingly adopted in education, research remains centered in STEM fields for spatial and conceptual learning (Irwanto et al., 2022; Maulana et al., 2024; Ozyurt & Ozyurt, 2024), while studies in the humanities, particularly poetry education, are still limited and fragmented, focusing more on heritage visualization than pedagogical integration in formal instruction (Boboc et al., 2022; Ramtohul & Khedo, 2024; Seifi et al., 2023). To date, no systematic review has examined AR's role in teaching folk poetry as intangible cultural heritage marked by symbolic language, oral transmission, and contextual knowledge. Given that folk poetry embodies local identity yet faces cultural erosion and declining continuity (Netra et al., 2023), this lack of synthesized evidence reflects a critical gap in understanding how AR can support symbolic interpretation, cultural identity formation, and learner engagement.

The 2019–2024 focus is relevant to the rapid growth of immersive technologies during and after COVID-19, which accelerated digital and technology-assisted learning (Hamzah et al., 2024; Hofer et al., 2021), and aligns with reforms such as Indonesia's Kurikulum Merdeka that emphasize contextualized and culturally responsive instruction. Reviewing AR in this period provides timely insight into emerging pedagogical practices and digital humanities innovation. Accordingly, this systematic review maps current AR applications in folk poetry education, identifies key affordances and limitations, and outlines future research needs. The findings offer practical implications for educators and curriculum developers by demonstrating AR's potential to revitalize cultural heritage learning and enhance interpretive, creative, and critical skills, positioning folk poetry education at the intersection of immersive technology, cultural preservation, and transformative learning (Adhe et al., 2024; Nasirudin et al., 2024).

Materials and Methods

This study employs a Systematic Literature Review (SLR) to synthesize existing knowledge and provide an overview of research on AR in folk poetry education. SLRs play a key role in identifying gaps, strengthening methodological rigor, supporting theoretical perspectives, and reducing redundancy in scholarship (Kraus et al., 2020; Laynor & Stevens, 2024; Murniarti et al., 2018). They are especially useful in emerging or fragmented fields by enabling rigorous evaluation of secondary sources from reputable journals and generating credible insights for future research directions (Kraus et al., 2020; Linnenluecke et al., 2020; Pranckutė, 2021; Snyder, 2019). In this study, the SLR approach is applied to map existing research, highlight trends, and reveal gaps in AR-based poetry education, where applications remain limited despite increasing academic attention (Page et al., 2021).

Database source

This study examines the application of Augmented Reality (AR) in poetry learning through a Systematic Literature Review (SLR). Database selection followed publication metadata and bibliometric indicators in accordance with established guidelines for rigorous literature reviews (Zhu & Liu, 2020). The credibility of data sources is crucial in SLRs, as it directly affects the validity and generalizability of the findings. Scopus is widely recognized as a comprehensive and authoritative database, indexing high-quality, peer-reviewed publications and thereby enhancing the reliability of literature-based research (Pranckutė, 2021). Although databases such as Web of Science (WoS) are also frequently used due to their global reputation and competitive indexing standards (Bramer et al., 2017; Li et al., 2018; Muka et al., 2020; Pranckutė, 2021; Zhu & Liu, 2020), this study relied exclusively on Scopus to ensure a focused and efficient retrieval process. Its extensive coverage of educational research and learning technologies supports a streamlined and methodologically consistent review.

Database and Search Strategy

This review relied exclusively on the Scopus database to identify relevant scholarly literature due to its broad coverage of peer-reviewed journals, conference proceedings, and book series across education, technology, and the humanities. Scopus is widely recognized for its rigorous indexing standards, reliable citation tracking, and suitability for systematic reviews in educational technology and digital cultural heritage. Its advanced search features and detailed metadata support precise, transparent, and reproducible literature retrieval.

The literature search was conducted solely in Scopus to ensure data consistency and minimize duplication, as the database already indexes a substantial proportion of records from sources such as Web of Science, ERIC, and Google Scholar. Although these databases were initially considered, they were excluded to maintain a streamlined review process. The search was carried out in January 2025 using the following Boolean string:

TITLE-ABS-KEY (“augmented reality” AND (“poetry” OR “folk poetry” OR “literary learning” OR “literary education”) AND (“culture” OR “heritage”))

The search was limited to English-language, peer-reviewed journal articles and conference papers published between 2019 and 2024. Filters were applied for document type (articles and conference papers) and subject areas (Social Sciences, Arts and Humanities, and Computer Science) to ensure relevance to the educational and cultural scope of AR research. Eligibility criteria were defined to ensure relevance, credibility, and alignment with the review objectives, following the PRISMA framework and refined through preliminary screening. Studies were evaluated based on focus, methodological rigor, and educational significance, with detailed inclusion and exclusion criteria presented in Table 1.

Criteria Type	Description
Inclusion Criteria	(1) Published between 2019–2024; (2) Focused on augmented reality (AR) in literary or poetry education; (3) Written in English; (4) Peer-reviewed journal or conference paper; (5) Discussed pedagogical, cultural, or technological aspects.
Exclusion Criteria	(1) Non-English publications; (2) Studies focusing solely on virtual reality or gaming without AR component; (3) Non-educational applications (e.g., marketing or engineering); (4) Grey literature or editorials; (5) Duplicate records.

Table 1. Inclusion and Exclusion Criteria

These criteria ensured rigorous study selection relevant to AR-based folk poetry education while reducing bias and improving transparency. The 2019–2024 timeframe reflects post-pandemic shifts in educational practice, when digital and immersive technologies, including AR, became more widely adopted to support engagement and experiential learning. It also corresponds with growing scholarly interest in using technology to revitalize intangible cultural heritage amid globalization and generational change, allowing this review to capture current trends, methods, and implementations at the intersection of augmented reality, education, and cultural preservation.

Preferred reporting items for systematic review and meta-analysis

This study adopts the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to examine the application of Augmented Reality (AR) in poetry learning. PRISMA provides a transparent and systematic procedure that enhances the reliability and validity of the review by guiding the identification, selection, and evaluation of relevant interdisciplinary studies (Page et al., 2021). Its structured approach ensures that only methodologically rigorous and relevant research is included, thereby improving the quality and coherence of the review findings (Page et al., 2021). Following the PRISMA framework, this review applied a structured and transparent process to identify, screen, evaluate, and include relevant studies. Each stage was documented to ensure replicability and reduce potential bias. The four PRISMA phases, Identification, Screening, Eligibility, and Inclusion, are outlined below and illustrated in the PRISMA flow diagram (Figure 1).

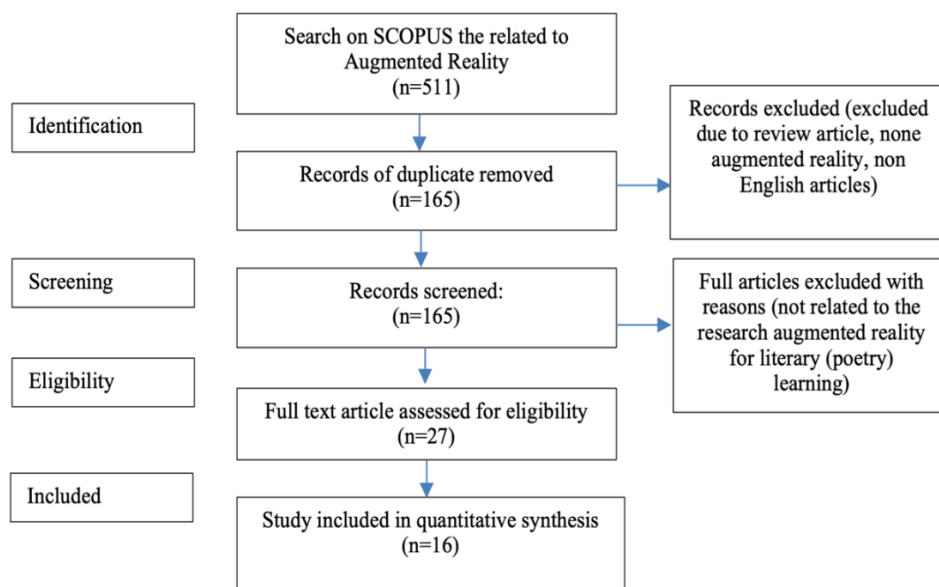


Figure 1. PRISMA Flow Diagram for Article Selection

Identification

The identification stage focused on selecting and expanding keywords related to Augmented Reality (AR) in poetry learning. To ensure broad coverage of relevant studies, synonymous and related terms were included, as recommended in systematic review practices (Shaffril, Samah, et al., 2021; Shaffril, Samsuddin, et al., 2021). Keyword development drew on prior literature, academic databases, and online platforms to capture varied terminology. The main keywords used were “Augmented Reality” and “Poetry.” Searches were conducted exclusively in the Scopus database due to its rigorous indexing standards, with the publication period limited to 2019–2024 to capture recent developments in AR-based poetry education.

Screening

The search process yielded 67 articles containing the keyword “Augmented Reality in learning” and 27 additional articles when combined with “Poetry.” Articles were systematically categorized into quantitative, qualitative, conceptual, or literature review studies to identify patterns in methodology and focus. This classification provided a strong foundation for further analysis and ensured comprehensive coverage of AR’s pedagogical applications in literature and poetry learning.

The selected articles constituted the core review materials. Duplicate records were first removed, followed by screening based on predefined inclusion and exclusion criteria (Table 2). Of the 94 full-text articles assessed, 16 were excluded due to limited relevance, resulting in 16 eligible studies that were fully reviewed and analyzed. This procedure followed established systematic review methods (Kraus et al., 2020; Shaffril, Samah, et al., 2021).

Criteria	Inclusion	Exclusion
Study type	Quantitative research Qualitative research Review paper	Conceptual paper
Language	English	Any other language
Document types	Final journal article, book chapter, and proceeding article	Book, report, and short survey
Study topics	Related to augmented reality in learning literature, folk poetry, and other learning	Other than augmented reality in learning literature, folk poetry, and other learning

Table 2. Inclusion and exclusion criteria

Inclusion

After removing 12 duplicates, 55 articles were screened based on titles and abstracts, of which 29 were excluded for lacking relevance to AR or educational contexts. The remaining 27 full-text articles were assessed for eligibility, resulting in 16 studies that met all inclusion criteria. This process is detailed in the PRISMA flow diagram (Figure 1), with screening conducted independently by two reviewers and discrepancies resolved through discussion to enhance reliability and reduce bias.

Data abstraction and analysis

The articles selected for thorough evaluation and analysis are based on the objectives of the Literature review. After reading the abstract, the article is extracted first, and then the complete article is carefully examined to determine the relevant topic. Figure 1 is a comprehensive synthesis of academic literature on augmented reality and poetry. Figure 1. It shows that the evaluation stage is carried out through the stages of identification, screening, feasibility, and interpretation (Page et al., 2021)

Selected articles were coded by purpose, research design, tools, outcomes, and implications, with the PRISMA diagram (Figure 1) outlining identification to inclusion stages. A narrative synthesis was used to integrate varied research designs, while thematic patterns from 16 studies were summarized through tables and charts (Figure 2; Table 3) showing trends in AR-based poetry learning, including publication year, country distribution, and thematic focus. To ensure transparency, two reviewers conducted data extraction independently, resolving differences by consensus and assessing study quality for design clarity, methodological rigor, and pedagogical relevance. Given the exploratory scope, descriptive statistics were applied without advanced analysis or meta-analysis, with supporting metadata detailed in Appendix A.

Discussion

Overview of Selected Studies

This review analyzed sixteen studies selected from an initial 67 Scopus-indexed publications through a rigorous screening process. These studies were examined by research type, design, data collection, participants, findings, and educational implications, focusing on AR integration in literary education, particularly folk and classical poetry. Four studies directly addressed folk poetry learning, one linked AR to tourism, and the rest explored broader literary applications. Research on classical Chinese poetry demonstrated that AR improves literary appreciation by presenting immersive cultural and historical contexts. At the same time, six studies on instructional material development showed AR's effectiveness in clarifying abstract concepts. Five additional studies highlighted AR's interactive and immersive features for general literary learning. Overall, the findings indicate that AR supports more dynamic, participatory, and context-rich poetry learning environments. Overall, the reviewed literature shows that AR enriches poetry learning by increasing engagement and deepening literary appreciation, with around 31% of studies focusing on folk poetry and 69% on broader literary education, indicating that AR-based folk poetry learning remains underexplored but holds strong potential for further pedagogical innovation.

Integration of augmented reality in poetry learning and simulation

Figure 2 and Table 3 show that AR integration in poetry learning is concentrated in East Asia, especially China, with limited representation elsewhere, including the UK, indicating uneven regional development and some use in literary-based tourism (Shaffril et al., 2021). The reviewed studies reveal that AR in folk poetry learning is mainly applied through technology-supported literary simulations that combine poetic content with interactive features, supporting experiential and context-rich learning.

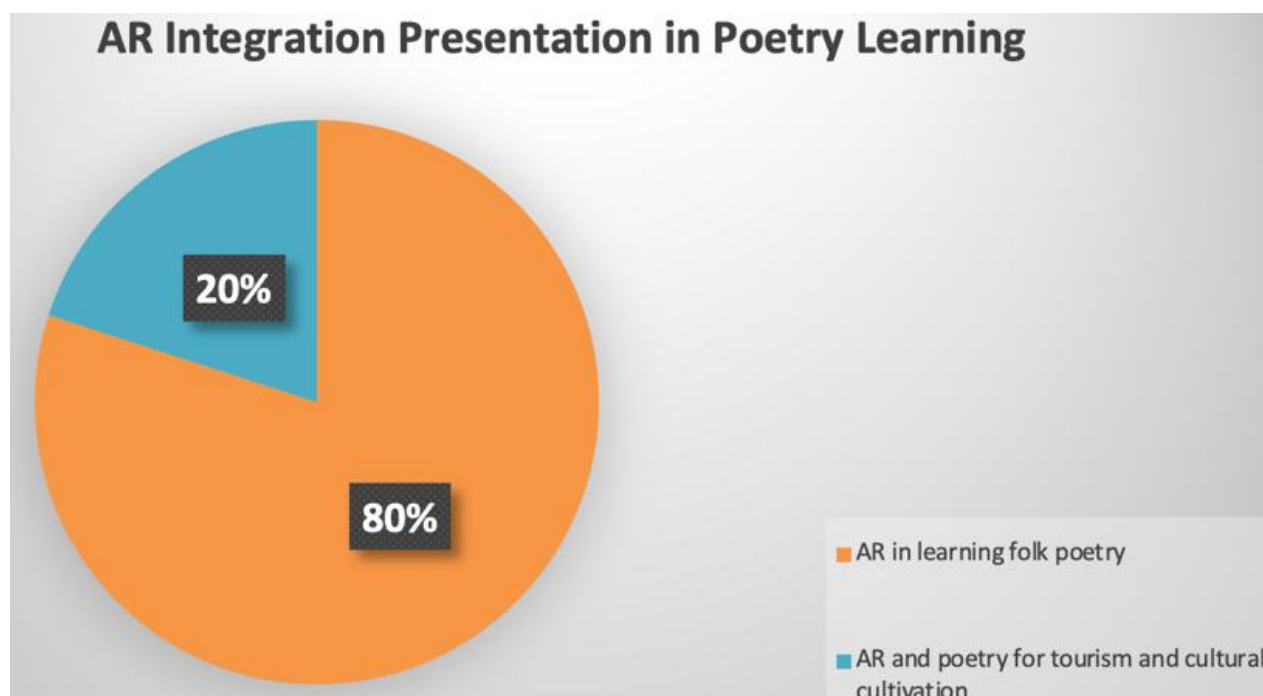


Figure 2. Integration of AR in literature learning

As shown in Figure 2, most AR implementations prioritize visual simulation and gamified interaction, emphasizing engagement over interpretive depth. This trend reveals a research gap in which AR's cultural and analytical potential remains underdeveloped. Future applications should incorporate interpretive scaffolding to support symbolic and contextual analysis, thereby linking technological innovation with literary understanding.

Ref	Name of Technology developed	AR	Development description
(Tian et al., 2024)	PoeticAR		PoeticAR" was developed to display poems based on physical scenes. The goal is to enhance the cultural experience and aesthetics of tourists.
(Yang et al., 2022)	Poetry in Painting		The app is designed to provide a comprehensive and interactive learning experience, combining elements of traditional culture with modern technology. The goal is to improve not only academic skills but also the creative abilities of users through an engaging and innovative approach to learning ancient Chinese poetry.
(Chao et al., 2021)	AR-Poetry		The integration of AR in this context leverages technology to create a more interactive and immersive learning experience. AR allows children to "see" and interact with elements of poetry in a 3D environment, which can help them better visualize and understand the poem's content.
(Wild et al., 2021)	UNBODY		The integration of AR in the project is highly innovative, combining immersive technology with poetic content to create a unique experience. UNBODY demonstrated the potential of AR to transform the way people interact with text and sound in physical spaces, opening new possibilities for literary appreciation and the performative arts.

(Mardasari et al., 2021)	AR	classical Chinese poetry,	The integration of AR in this context allows students to see visualizations of classical Chinese poetry, which may include elements such as: (1) The poem's text appearing in a 3D environment. (2) Illustrations or animations that describe the content of the poem (3) Contextual information that appears when students interact with text or images
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Integrating Augmented Reality (AR) into poetry learning enhances engagement and relevance for 21st-century learners by supporting meaningful, contextualized, and technology-assisted instruction (Table 2). Although less common than in fields like gaming and tourism, AR is increasingly relevant for literary learning (El Shemy et al., 2024), with Figure 3 showing poetry as an underexplored yet promising area. By visualizing symbolism, cultural meaning, and historical context, AR improves accessibility and participation, emphasizing the need for dedicated tools and instructional frameworks.

Augmented Reality as a Catalyst for Innovation in Poetry Learning

Despite recent advances, the limited adoption of AR in folk poetry education reflects cultural and pedagogical challenges, as oral performance, communal interaction, and localized symbolism are not easily translated into digital formats, and teachers often lack technical training, resources, and equitable access to infrastructure. These conditions show that AR integration requires not only technological innovation but also contextual awareness, teacher capacity-building, and inclusive access. Thus, building on earlier integration trends, AR can function as a bridge between traditional literary learning and technological innovation by combining visual, auditory, and interactive elements to create multisensory experiences that enhance engagement and revitalize folk poetry instruction for more meaningful, context-rich learning.

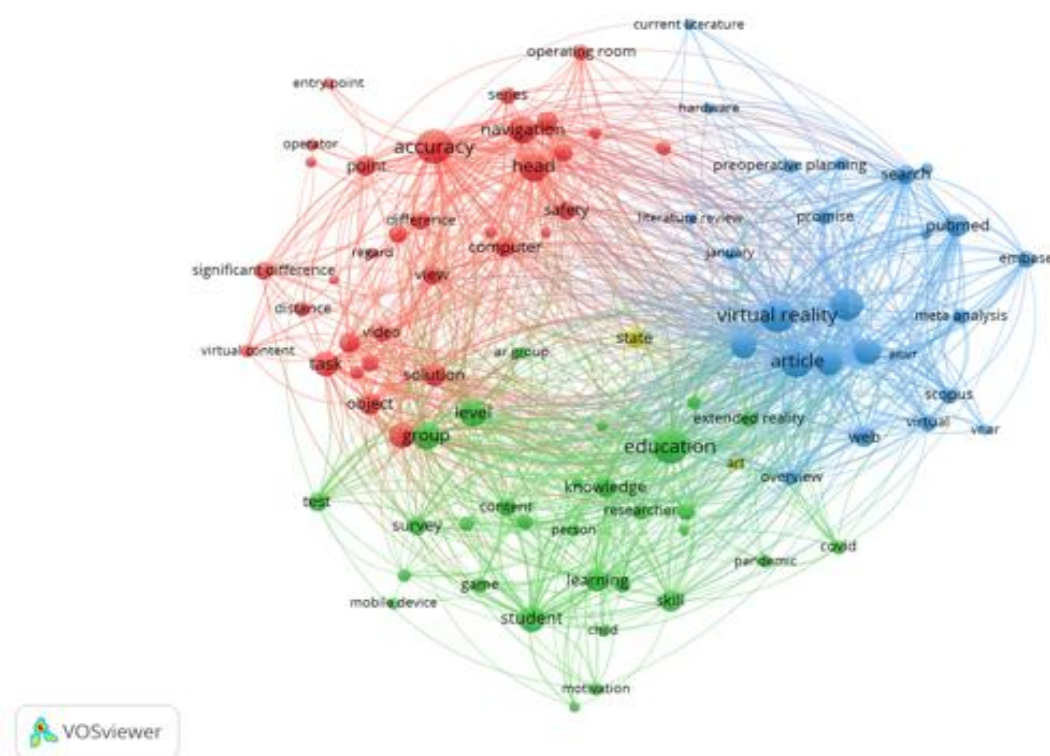


Figure 3. Distribution of keywords that are widely used in previous research

Integrating Augmented Reality (AR) into poetry learning represents a methodological innovation that helps address perceptions of folk poetry as abstract or difficult by adding visual, auditory, and interactive elements that increase accessibility and engagement (Di Fuccio et al., 2024; Stalheim & Somby, 2024; Szekely et al., 2023).. This multisensory approach enhances attention, comprehension, and appreciation, with immersive 3D AR objects enabling simulated poetic environments that foster deeper emotional and cognitive connections (Khan et al., 2023; Lim & Kamin, 2023). As emphasized by O'Connor & Mahony (2023) and Stalheim & Somby (2024), AR integrates digital information into real-world physical and social contexts, supporting experiential and situated learning (Dunleavy & Dede, 2014).

Beyond enhancing engagement, AR functions as a bridge between intangible cultural heritage and modern technology by supporting the preservation and transmission of cultural values in formats relevant to the digital generation (Di Fuccio et al., 2024; Tian et al., 2024). Studies show that AR-based environments increase motivation and interest, especially when combined with game-like and playful elements, which create enjoyable yet educationally relevant learning experiences (Buchner & Kerres, 2023; Nordin et al., 2022; Priyadi, 2022)Asty et al., 2023). AR also supports comprehensive skill development by integrating reading, listening, speaking, and writing activities that foster creativity and imagination (Khan et al., 2023; Reeves et al., 2021; Sari et al., 2022) Faisol et al., 2021), while offering flexible, personalized learning that adapts to individual needs, styles, and contexts for both formal and self-directed learning.

Evidence from multiple studies confirms the effectiveness of AR in educational settings (Alkhabra et al., 2023; Nurhayati et al., 2022; Setyowati et al., 2023). AR has been successfully implemented as a companion medium to traditional textbooks, highlighting the importance of strengthening interaction design to maximize its pedagogical value (Buchner, 2024; Buchner & Höfler, 2024; Kiili et al., 2024; Ulfah et al., 2023). Research emphasizes the need to explore diverse AR components, including poster triggers, video overlays, and interactive object galleries, to enhance learning experiences (Adhe et al., 2024; Suprpto et al., 2021; Yang et al., 2022).Moreover, AR development is inherently interdisciplinary and cross-cultural, fostering dialogue between education, technology, art, and human–computer interaction (Hamzah et al., 2024; Low et al., 2022; Nuanmeesri, 2024; Sulastrri, 2025; Szekely et al., 2023).

Despite its potential, AR integration in poetry learning presents challenges that require attention to usability, personalization, and alignment with pedagogical goals (Di Fuccio et al., 2024; Muktiani et al., 2022). Given the abstract and interpretive nature of poetry, AR platforms must be intuitive, accessible, and adaptable, with customizable pacing and focus to enhance effectiveness, while offering opportunities for real-time collaboration and immediate peer or teacher feedback; AR-based assessment can further evaluate cognitive, emotional, and aesthetic engagement through immersive interpretive tasks (Boboc et al., 2022; Mendoza et al., 2023a; Sánchez-Jara et al., 2023; Silviana & Villagr , 2016). Conceptually, this development aligns with scholarship at the intersection of immersive technology, cultural heritage, and the humanities, grounded in theories of AR and experiential learning (Azuma, 1997; Billinghamurst et al., 2014; Dunleavy & Dede, 2014; Klopfer & Squire, 2008) and informed by digital humanities perspectives that position AR as both a technological and interpretive medium (Burdick et al., 2012; Jewitt & Jones, 2013), thereby contributing to educational innovation, cultural sustainability, and intercultural understanding.

Evolution and Future Trajectory of AR in Folk Poetry Education

The development of Augmented Reality (AR) in education shows a clear progression. Early studies (2010–2014) focused on static visualization for cultural artifacts and museums (Boboc et al., 2022; Ramtohl & Khedo, 2024). Between 2015 and 2019, mobile and marker-based AR enabled interactive poetry learning through 3D visualization and gamification (Chao et al., 2021; Yang et al., 2022). During the COVID-19 period (2020–2022), AR supported remote cultural learning (Hamzah et al., 2024; Hofer et al., 2021). Recent developments (2023–2024) integrate AI-driven adaptability, semantic enrichment, and cloud collaboration, aligning with digital humanities and multimodal cultural learning (Adhe et al., 2024; Nasirudin et al., 2024; Papakostas et al., 2023).

Phase	Year	Characteristics
Phase 1	2010–2014	Static AR visualization → museum/heritage
Phase 2	2015–2019	Mobile/marker AR; 3D; gamification; narrative
Phase 3	2020–2022	Pandemic → remote cultural learning
Phase 4	2023–2024	AI-adaptive; cloud collaborative; multimodal; semantic

Table 4. Timeline Summary of Key Milestones (≈2010–2024)

Future AR applications in folk poetry learning are moving toward adaptive, collaborative, and culturally responsive models. The growth of low-cost platforms and AI-driven personalization will expand access and support cross-community storytelling, provided ethical frameworks ensure cultural accuracy and community ownership. Overall, AR is shifting from simple visualization toward a participatory tool for sustaining intangible heritage and deepening literary engagement.

Future Directions and Pedagogical Implications

As AR in poetry education is still emerging, future research should focus on adaptive, inclusive, and ethically grounded designs that respond to learner diversity and cultural sensitivity. Priority directions include developing adaptive AR systems that personalize learning through user modeling, interaction tracking, and context-aware interfaces (Kruglyk, 2023; Marienko et al., 2020). Culturally oriented approaches, such as heritage-based AR with emotion and storytelling (Kuan & Shiratuddin, 2022) and gamified models embedding local values, show strong potential for folk poetry instruction. Recent studies in Indonesia confirm increased motivation and comprehension when cultural elements are integrated into interactive AR experiences (Dawis et al., 2024; Mendoza et al., 2023b; Seifi et al., 2023; Wulandari et al., 2025).

Studies indicate that AR-based poetry learning improves motivation, attention, and comprehension compared to conventional instruction, with multisensory features that support cognitive and affective learning by visualizing symbolism and enhancing recall (Khan et al., 2023; Nordin et al., 2022). Emerging AI-supported collaboration points toward learning environments where students co-construct meaning through immersive, experiential interaction (Saif et al., 2021). Priority directions include developing adaptive AI–AR platforms, addressing ethical and cultural representation issues, enabling cross-cultural collaboration, and integrating emotion-based interaction and local content to ensure equity and relevance. Overall, current evidence shows that AR can advance cultural sustainability and multiliteracy, positioning it as a meaningful tool for revitalizing literary education and preserving intangible cultural heritage.

Conclusions

Integrating Augmented Reality (AR) into poetry learning enriches literary education and supports the preservation of intangible cultural heritage. Its immersive and interactive features enhance engagement, help visualize abstract symbolism, and foster 21st-century competencies such as creativity, critical thinking, and digital literacy, making AR especially effective for revitalizing interest in folk poetry. However, research gaps remain, including limited study of poetic genres, a lack of adaptive and personalized learning designs, and minimal evidence of long-term outcomes. Ethical and cultural considerations also require deeper attention, particularly in diverse and underrepresented contexts. Future research should therefore prioritize adaptive, culturally sensitive AR systems developed with community involvement and interdisciplinary collaboration, ensuring authentic representation and meaningful learning. With such advancements, AR can evolve into a sustainable pedagogical tool that strengthens poetry education across generations in the digital era.

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