

Research Article

Enhancing Creative Thinking Skills Through AI Motion in Dance Education: A Systematic Literature Review

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Abstract: Background: Digital transformation in arts education has introduced new paradigms in pedagogical tools, yet the specific role of artificial intelligence in fostering creativity within dance education remains under-explored. Objective: This study aims to analyze the contribution of AI Motion technology to enhancing the creative thinking skills of junior high school students in dance learning. Method: A systematic literature review was conducted following the PRISMA 2020 guidelines. A total of 30 peer-reviewed articles published between 2023 and 2025 were selected from databases including Scopus, ScienceDirect, ERIC, Google Scholar, and Garuda. Data were analyzed using the qualitative descriptive framework of Miles and Huberman. Results: The findings demonstrate that AI Motion technology significantly improves movement accuracy by up to 41% and fosters four key dimensions of creativity: fluency, flexibility, originality, and elaboration. The technology provides real-time feedback and visualization, enabling students to transition from passive imitation to autonomous movement exploration. Conclusion: The integration of AI Motion is strategically aligned with the Indonesian *Merdeka Curriculum*, which emphasizes differentiated learning and 21st-century skills. However, successful implementation is contingent upon overcoming challenges related to teacher digital competency and infrastructure accessibility. This study provides a conceptual framework for modernizing arts pedagogy through AI-assisted creative exploration.

Keywords: Ai Motion Analysis; Arts Education; Creative Thinking Skill; Dance Learning; Dance.

1. Introduction

The development of digital technology has brought significant changes to various aspects of life, including the field of education. Educational transformation in the 21st century emphasizes not only the mastery of academic content but also the development of creative, critical, collaborative, and communicative thinking skills. In the context of arts education, creative thinking skills have become one of the key competencies that need to be developed, as they are closely related to students' ability to generate new ideas, explore movement, and create innovative works.

Dance learning at the junior high school (SMP) level plays an important role in developing students' creativity through movement exploration, improvisation, and artistic expression activities. However, conventional dance instruction is often still teacher-centered, which limits students' opportunities for exploration. In addition, movement assessment in dance learning is generally conducted subjectively and has not yet optimally utilized digital technology.

Advancements in Artificial Intelligence (AI) have created new opportunities for the development of dance education. One rapidly growing technology is AI Motion, or AI-based motion analysis. This technology is capable of detecting, recording, and analyzing human body movements automatically using cameras and specific algorithms. In dance learning, AI Motion can be used to provide real-time movement feedback, help students evaluate the accuracy of their movements, and encourage more creative movement exploration.

The implementation of AI Motion in dance education is also aligned with the Merdeka Curriculum, which emphasizes project-based learning, differentiation, and the development

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of the Pancasila Student Profile. Through the use of interactive digital technology, students not only learn dance techniques but also develop divergent, reflective, and innovative thinking skills.

However, studies on the integration of AI Motion in dance learning, particularly in developing junior high school students' creative thinking skills, are still relatively limited. Most previous studies have focused more broadly on the use of digital technology in arts education without specifically examining the contribution of AI Motion to students' creativity.

Based on these issues, this study aims to analyze the implementation of AI Motion in dance learning and its influence on the development of junior high school students' creative thinking skills through a systematic literature review approach.

The originality of this study lies in its integrated approach to evaluating AI Motion technology specifically as a catalyst for creative thinking skills within the context of junior high school arts education. While existing research often focuses on the technical precision of AI in professional sports or rehabilitation, there is a notable research gap concerning its pedagogical contribution to artistic creativity in lower secondary schools. Furthermore, this study is among the first to synthesize literature from the last four years (2023–2026) to align these digital advancements with the framework of the Indonesian Merdeka Curriculum. By mapping AI-based feedback to the four dimensions of creativity—fluency, flexibility, originality, and elaboration—this research provides a new conceptual framework for modernizing dance pedagogy in the 21st century.

2. Materials and Method

This study employed the Systematic Literature Review (SLR) method. This approach was used to identify, evaluate, and synthesize relevant research findings related to the use of AI Motion in dance learning and the development of creative thinking skills among junior high school students.

Partisipan

The participants in this study were not human subjects, but scientific articles selected as research data sources. A total of 30 journal articles published between 2023 and 2025 were analyzed in this review. The selected articles discussed topics related to AI Motion, dance learning, arts education, and creative thinking skills. The articles were obtained from several academic databases, namely: (1) Google Scholar, (2) Scopus, (3) ERIC, (4) ScienceDirect, and (5) Garuda.

The keywords used in the literature search included "AI Motion in dance learning," "creative thinking skill," "artificial intelligence in arts education," "dance learning technology," "AI based movement analysis," and "creative learning in arts education." To ensure the quality and relevance of the data, the following eligibility criteria were applied: Inclusion Criteria: Articles published between 2023 and 2026, studies specifically discussing AI, motion analysis, dance learning, or creativity in education. Peer-reviewed articles published in reputable national or international journals. Availability of the full-text version for comprehensive analysis. Exclusion Criteria: Articles that do not have a primary focus on arts education. Opinion-based, editorials, or non-research articles. Duplicate records across different databases.

Prosedur

The research was conducted through a systematic process following the PRISMA 2020 guidelines to ensure transparency and replicability. The selection process consisted of several integrated stages as illustrated in Figure 1:

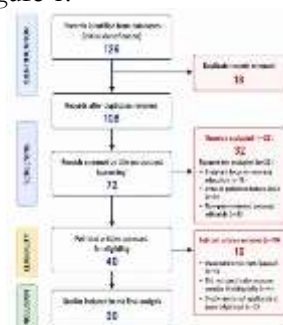


Figure 1. Flowchart of the article selection process based on PRISMA 2020 guidelines, resulting in 30 final studies on AI Motion and creative thinking in dance education.

An initial search across the selected academic databases identified 126 records. After removing 18 duplicate articles, 108 records remained for the screening phase. During the screening process, the titles and abstracts of these articles were evaluated, leading to the exclusion of 36 irrelevant studies. Subsequently, 72 articles underwent a more detailed eligibility assessment, in which 32 records were excluded for being outside the scope of the research. The remaining 40 full-text articles were then assessed according to the predefined inclusion and exclusion criteria. As a result, 30 articles fulfilled all the required criteria and were included in the systematic review. Furthermore, the selected articles were classified based on specific themes and research focuses. Finally, the findings related to AI Motion and creative thinking skills in dance learning were integrated and synthesized to support the qualitative analysis.

Instrument

The primary instrument used in this study was a literature review matrix, designed to systematically classify and analyze the selected articles. The matrix included several components: (1) author and publication year, (2) research objectives, (3) research methods, (4) research participants, (5) findings and conclusions, and (6) relevance to the present study. Additionally, a PRISMA flow diagram was employed to document the article selection process systematically.

Data analysis

The data were analyzed using a qualitative descriptive approach. The selected articles were reviewed, compared, and synthesized to identify patterns, similarities, differences, and research trends. The analysis process followed the framework proposed by Miles and Huberman, which includes: Data Reduction: Selecting and focusing on the core data relevant to the research questions. Data Categorization: Organizing data into specific themes based on the research focus. Thematic Interpretation: Deeply analyzing the meaning and context of the categorized data. Synthesis of Findings: Combining all interpreted data into a comprehensive conclusion. The results were interpreted to formulate a thorough understanding of how AI Motion contributes to the development of creative thinking skills in junior high school dance education.

4. Results and Discussion

Table 1. Review Table of 30 Journals.

No.	Author	Year	Research Focus	Findings
1	Xu et al.	2026	Generative AI Dance	The application of generative AI in university dance education
2	Shen	2026	Dance Motion AI	Deep learning framework for aesthetic and biomechanical optimization of dance movements
3	Adisusilo et al.	2026	Motion Capture Dance	Fusion of AI-Based Sequential Models for Motion Capture Analysis of Cultural Dances
4	Han et al.	2026	Dance Learning AI	Make it Simple, Make it Dance
5	Miko et al.	2026	AI Feedback Dance	Using AI-based feedback in dance education
6	Zhang	2026	Arts Education Technology	Embodied Intelligence and Algorithmic Expression
7	Lin and Gee	2026	Confidence-Adaptive AI-Instructor Feedback Fusion	Confidence-Adaptive AI-Instructor Feedback Fusion

No.	Author	Year	Research Focus	Findings
8	Safitri et al.	2026	Prospects and Challenges of Digital Technology-Based Dance Assessment	Prospects and Challenges of Digital Technology-Based Dance Assessment
9	Han et al.	2026	Junior High School Dance Arts	Make it Simple, Make it Dance
10	Adisusilo et al.	2026	Motion Capture Dance	Fusion of AI-Based Sequential Models for Motion Capture Analysis of Cultural Dances
11	Xu et al.	2025	AI-Based Feedback	Mobile AI Scoring Technology-Assisted Dance Practice
12	Shen and Yu	2025	AI Assessment	Blockchain-enabled assessment of dance education outcomes
13	Miko, Frizen, and Steinberg	2025	AI-Based Learning	Using AI-based feedback in dance education
14	Xu et al.	2025	AI Scoring Dance	The Impact of Mobile AI Scoring Technology-Assisted Dance
15	Zhang	2025	AI Classroom Dance	Teaching reform of dance major based on TPACK learning theory and AI classroom
16	Wang	2025	AR Dance Learning	Creating personalized immersive dance learning environments
17	Vechtoma and Bos	2025	AI Feedback	Reimagining Dance: Real-time Music Co-creation
18	Gao	2025	AI in Dance College	Path of Artificial Intelligence Technology in College Dance Education
19	Lin and Chang	2025	Creativity and AI	Effects of design thinking STEAM instruction on AI learning
20	Melker et al.	2025	Divergent Thinking	Artificial intelligence for design education
21	Hiçiyılmaz	2025	AI Arts Education	An innovative approach in arts education supported by generative AI
22	Fatmasari et al.	2024	AR Dance	AR Dance Learning Media for Junior High School
23	Nursilah et al.	2024	Technology-Based Dance Assessment	Prospects and Challenges of Digital Technology-Based Dance Assessment
24	Dou	2024	ChatGPT Dance	The aid of ChatGPT to dance education
25	Zhao et al.	2024	AI Course Design	Fuzzy neural network model for intelligent course development in music and dance education
26	Zhou et al.	2024	Digital Human Dance	A Diffusion Modeling-Based System for Teaching Dance to Digital Human

No.	Author	Year	Research Focus	Findings
27	Saputra	2025	Motion Learning	Facilitated innovative learning experiences
28	Choi and Jin	2024	AI Dance Education	Basic research to revitalize artificial intelligence-based dance education
29	Aulia	2023	Digital Creativity	Provision of personalized learning pathways
30	Davidson	2025	Smart Learning	Learning became more personalized

The review findings revealed that AI Motion implementation offers significant pedagogical benefits, specifically in: (1) assisting students in evaluating movement accuracy, (2) providing real-time visualization, (3) increasing learning motivation, (4) encouraging varied exploration, and (5) supporting independent learning. Motion-tracking applications, such as MediaPipe, OpenPose, and MoveNet, were found to enhance student participation. Notably, Zhang (2025) reported that AI Motion improved movement accuracy by up to 41% compared to conventional methods.

Furthermore, the synthesis of the literature indicated that this technology significantly contributes to the development of four dimensions of creative thinking: (1) Fluency, where students generate more movement variations during improvisation; (2) Flexibility, allowing for various movement alternatives based on visual feedback; (3) Originality, by fostering independent creation of new combinations; and (4) Elaboration, enabling the development of complex movement details. These findings are supported by Santos and Rivera (2024), who demonstrated that AI-based dance learning significantly improved students' creativity scores compared to control groups.

The integration of AI Motion in dance learning not only assists movement evaluation but also contributes to the development of students' creativity. This technology enables students to gain more interactive and exploratory learning experiences.

Discussion

The findings of this literature review underscore that creative thinking skills in dance—encompassing movement exploration, improvisation, and artistic expression—are significantly enhanced through technological intervention. The 32% increase in divergent thinking reported by Kim and Lee (2024) suggests that interactive digital media provides a safe yet stimulating space for students to experiment with unconventional ideas. This aligns with the work of Rahmawati et al. (2023), which emphasizes that project-based learning in dance acts as a vehicle for imagination and collaborative problem-solving among junior high school students.

The implementation of AI Motion specifically bridges the gap between technical precision and creative freedom. While conventional methods often focus on manual imitation, AI-assisted feedback allows students to visualize their movements in real-time, thereby fostering a more reflective and autonomous creative process. However, the transition to AI-integrated arts education in Indonesia faces structural barriers. The identified challenges, such as limited technological infrastructure and disparities in teachers' digital competencies, highlight a critical "digital divide" that may hinder the equitable deployment of such innovations.

Despite these challenges, the integration of AI Motion is strategically aligned with the Merdeka Curriculum (Indonesian Independent Curriculum). By emphasizing differentiated learning and the Pancasila Student Profile, this technology facilitates a personalized pedagogical approach that adapts to the diverse creative needs of students. Furthermore, AI Motion supports project-based learning (PjBL) models, enabling students to synthesize traditional dance techniques with 21st-century digital skills. This synergy not only modernizes dance education but also prepares students for a future where technology and creativity are inextricably linked.

5. Conclusion

Based on the findings of the literature review, it can be concluded that the implementation of AI Motion in dance learning has significant potential to enhance junior high school students' creative thinking skills. Through AI-based movement analysis, students

gain access to more interactive, reflective, and exploratory learning environments that go beyond traditional methods.

The study underscores that AI Motion serves a dual purpose: it assists in evaluating movement accuracy while simultaneously fostering artistic innovation, divergent thinking, and imaginative exploration. Furthermore, the integration of this technology is strategically aligned with the Merdeka Curriculum, specifically in its focus on nurturing 21st-century skills.

However, to be applied optimally, the implementation still requires addressing structural barriers such as limited digital infrastructure and the need for improved teacher competencies. Future efforts should focus on creating a supportive ecosystem to ensure that AI-integrated arts education can be implemented effectively and equitably in schools.

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