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Article

Interactive Dance Learning: Enhancing High School Students' Critical Thinking Skills

Stefi Winda Pratiwi[1]*, Elindra Yetti[2], Rizky Taufik Rakhman[3]

[1] Universitas Negeri Jakarta, Indonesia; e-mail: stewindap95@gmail.com
[2] Universitas Negeri Jakarta, Indonesia; e-mail: elindrayetti@unj.ac.id
[3] Universitas Negeri Jakarta, Indonesia; e-mail: rizkitr@unj.ac.id

* Corresponding Author : Stefi Winda Pratiwi

Abstract: This study investigates the effect of interactive learning in traditional dance education on students' critical thinking skills at the senior high school level. The background highlights the dominance of rote-based teaching in dance classes and the lack of reflective and analytical approaches that can foster students' higher-order thinking. A quasi-experimental method with a pretest-posttest control group design was employed, involving 72 tenth-grade students from several high schools in South Jakarta. The experimental group received interactive dance instruction integrating reflection, interpretation, and peer discussion, while the control group received conventional instruction. Data were collected through critical thinking tests, classroom observations, and student perception questionnaires. The results showed a significant improvement in the experimental group's critical thinking scores, with a posttest average of 88.2 and a gain score of 0.71 (high category), compared to the control group's posttest average of 66.7 and gain score of 0.21 (low category). Paired t-test and independent t-test analyses confirmed statistically significant differences ($p < 0.05$) between the two groups. Observation and questionnaire data revealed that students in the interactive group exhibited higher engagement in critical thinking activities such as interpretation, evaluation, and reasoning. These findings confirm that interactive dance learning not only enhances aesthetic understanding but also promotes critical thinking, making it a valuable pedagogical approach for 21st-century education.

Keywords: Critical thinking, High school education, Interactive learning, Traditional dance, Video-based learning

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1. Introduction

Dance, as part of arts education in schools, plays a strategic role in shaping students' cultural appreciation, aesthetic expression, and character development. In the context of 21st-century education, critical thinking is regarded as an essential skill that enables students to process information reflectively, independently, and responsibly. Without critical thinking training, students tend to remain passive, absorbing information without the ability to evaluate, connect, or interpret it independently. This limitation impedes their problem-solving capabilities and their ability to respond flexibly to challenges[1]. Despite its potential, high school dance instruction in Indonesia is often limited to rote memorization and traditional delivery methods. Teachers typically emphasize technical accuracy in movements and mastery of choreography rather than encouraging interpretative and analytical engagement. The learning process focuses primarily on final performances rather than critical reflection, leaving students with minimal opportunities to connect dance with cultural, social, or personal meaning.

Preliminary observations reveal that many teachers lack strategies to develop students' critical thinking through theoretical aspects of dance learning. This is partly due to the inappropriate pedagogical approaches adopted, which result in less interactive and reflective

instruction. Students remain passive, struggling to ask questions, generate ideas, or present their work in meaningful ways [2].

Previous studies have shown that reflective and exploratory learning approaches in dance can promote critical thinking, including skills such as analysis, argumentation, and decision-making. Media-based interactive learning—particularly video-based learning—has emerged as a promising tool to stimulate students' higher-order thinking. For example, the development of GEMBI, an interactive physics learning video, demonstrated improved critical thinking outcomes when implemented with the ADDIE model[3]. Robert H. Ennis' framework identifies key indicators of critical thinking: problem recognition, evaluation, inference, open-mindedness, and decision-making[4]. Educational video media designed with relevant, contextual, and interactive features have proven to be effective in promoting reflection and analytical thinking. Video-Based Learning (VBL), especially when incorporating interactivity, not only enhances student engagement but also supports metacognitive and critical thinking development[1].

In the field of arts education, research by [5] confirms that digital multimedia—such as videos and applications—has a positive effect on student expression, participation, and cultural awareness. Moreover, interactive videos have been shown to outperform web-based modules in enhancing critical thinking by providing real-time feedback and more dynamic learning experiences[6]. However, most studies on interactive learning effectiveness are concentrated in science, math, or general education, with limited focus on dance education—particularly at the senior high school level. Given dance's symbolic richness and cultural significance, it holds strong potential for nurturing students' critical thinking. This research aims to bridge that gap by examining the extent to which interactive learning in traditional dance education impacts students' critical thinking skills in senior high schools.

2. Related Work or Literature Review

Previous studies have established that integrating interactive media into educational settings enhances students' cognitive engagement and promotes the development of higher-order thinking skills. [1]emphasize the role of video-based learning (VBL) in cultivating metacognitive and reflective skills through interactivity, which aligns with 21st-century educational goals. In the arts domain, [5] conducted a systematic review and concluded that the use of multimedia in elementary dance education improves student participation and appreciation of cultural values. Similarly, [6] found that interactive video media outperformed web modules in fostering students' critical thinking skills, offering more dynamic feedback and structured reflection. [4]provided a foundational framework of critical thinking, identifying core dispositions such as problem identification, inference, and decision-making. This model has been widely used in educational assessments and serves as the conceptual basis for many critical thinking evaluations, including in this study.

In Indonesia, [2] highlighted the lack of reflective learning strategies in high school dance classes, leading to passive student involvement. Their findings support the argument for adopting heutagogical and exploratory approaches in arts education. Further supporting this need, [3] demonstrated the effectiveness of the ADDIE-based GEMBI interactive video in improving students' critical thinking in physics, suggesting that similar models could be adapted for the arts. Despite these advances, most research has focused on science or general education, with limited application to traditional dance instruction. This study fills that gap by exploring how interactive learning methods—such as symbolic interpretation and reflective discussion—can enhance critical thinking in the context of high school dance education.

3. Proposed Method

This study employed a quasi-experimental method using a pretest-posttest control group design. The approach aimed to assess the impact of interactive dance learning on students' critical thinking skills. The experimental group received instruction through interactive strategies—such as video-based discussion, reflection prompts, and symbolic interpretation activities—while the control group followed conventional dance instruction focused primarily on memorization and performance execution.

3.1. Participants and Setting

Participants included 72 tenth-grade students from several senior high schools located in South Jakarta, divided equally into two groups: experimental (n = 36) and control (n = 36). Schools were selected purposively based on the availability of active dance teachers, willingness to implement interactive approaches, and readiness in terms of supporting infrastructure.

3.2. Instruments and Validation

Three instruments were developed and validated for this study:

3.2.1 Critical Thinking Tes

A set of pretest and posttest questions based on [4] critical thinking framework, targeting indicators such as problem recognition, reasoning, interpretation, and decision-making.

3.2.2 Observation Rubric

Used during classroom sessions to capture students' active participation, interaction, and demonstration of critical thinking.

3.2.3 Student Perception Questionnaire

A Likert-scale questionnaire measuring students' motivation, engagement, and perception of the interactive dance learning process.

Instrument validation was conducted by two experts: one in dance pedagogy with over five years of experience, and another in educational assessment. Items were reviewed for clarity, alignment with critical thinking indicators, and contextual relevance. Trial testing with a small group was conducted to assess item validity and reliability.

3.3 Data Collection and Analysis

Quantitative data from pretest and posttest scores were analyzed using paired t-tests (to assess within-group improvement) and independent t-tests (to compare between groups). Observational data were used to triangulate quantitative findings and identify behavioral indicators of critical thinking. Student questionnaire responses were analyzed descriptively to evaluate their perceptions of the interactive learning experience.

4. Results and Discussion

This section presents the results of the quasi-experimental study, including initial data analysis, statistical evaluation, and interpretation of findings. The study employed both hardware and software components to facilitate the interactive learning process. For video-based learning, classroom projectors, laptops, and sound systems were used, while observation and student response data were recorded manually and digitized using spreadsheet software. Statistical analysis was conducted using SPSS 26 to perform paired t-tests and independent t-tests, which tested the hypothesis that interactive dance learning improves critical thinking skills more significantly than conventional instruction. Data were collected from 72 students and evaluated based on critical thinking indicators developed by [4], including problem identification, inference, interpretation, and decision-making. The following subsections detail the quantitative results from pretest and posttest scores, qualitative insights from class observations and questionnaires, and analysis of the implications of these findings in relation to the study's initial hypothesis.

4.1. Pretest–Posttest Results

The analysis of pretest and posttest data revealed significant improvements in the critical thinking abilities of students in the experimental group. The average pretest score for the experimental group was 57.9, which increased to 88.2 after the intervention. In contrast, the control group's scores only improved modestly, from 58.4 to 66.7.

Table 1. Comparison of Pretest and Posttest Scores

Group	N	Pretest Mean	Posttest Mean	Gain Score	Improvemen Category
Experimental	36	57.9	88.2	0.71	High
Control	36	58.4	66.7	0.21	Low

The gain score for the experimental group was 0.71, categorized as high, whereas the control group's gain score was 0.21, which falls into the low category. Paired t-test results indicated a statistically significant improvement within the experimental group ($p = 0.000 < 0.05$), confirming the effectiveness of the interactive learning strategy. Meanwhile, the control group did not show significant improvement ($p = 0.072 > 0.05$). The independent t-test also confirmed a significant difference in posttest scores between the two groups ($p = 0.001 < 0.05$), indicating that students who experienced interactive dance learning exhibited higher levels of critical thinking than those in the traditional learning group.

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4.2. Observational and Questionnaire Findings

Observations conducted during class sessions revealed that students in the experimental group were more actively involved in asking questions, interpreting symbolic dance elements, and participating in group discussions. These behaviors correspond to several critical thinking indicators outlined by [4], such as inference, interpretation, and decision-making. The student perception questionnaire further supported these findings. Highlights from the responses include:

1. 91% of students in the experimental group felt the interactive approach encouraged deeper thinking and reflection.
2. 87% agreed that interactive elements such as video analysis, symbolic interpretation, and group reflection enhanced their understanding of dance.
3. In contrast, only 58% of students in the control group reported feeling engaged or intellectually challenged by conventional dance instruction.

These results echo the findings of [7], who found that reflective video practices in modern dance classes fostered deeper student engagement and understanding. Similarly, [8] emphasized that video-supported self-evaluation helped dance students develop objectivity, analytical reasoning, and stronger performance awareness. Such outcomes are reinforced by[8], whose study in higher education demonstrated how video reflections enabled students to connect artistic intention with reflective practice, enhancing their interpretive skills. [9] also observed that interactive, video-based instruction helped maintain community and reflective engagement in remote dance learning contexts, suggesting broader applicability of these methods.The student perception questionnaire further supported these findings. Highlights from the responses include:

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These findings align with [1], who argue that interactive, video-supported learning environments promote metacognitive awareness and stimulate higher-order thinking skills. The results also reinforce the conclusion by [6] that real-time feedback and structured reflection embedded in interactive media can enhance the development of critical thinking.

4.3. Interpretation and Educational Implications

The results demonstrate that interactive dance learning—through its emphasis on student engagement, interpretation, and reflection—not only enhances technical performance but also contributes to the holistic development of cognitive skills. This outcome is particularly relevant in the context of 21st-century education, which values creativity, collaboration, and critical reasoning. The study suggests that dance, when taught interactively, can serve as a fertile ground for critical thinking development. Educators are encouraged to integrate video-

based resources, structured reflection prompts, and symbolic discussions into their teaching practices to maximize learning outcomes.

1. Pretest–Posttest Results
2. Observational and Questionnaire Findings
3. Interpretation and Educational Implications

5. Comparison

The findings of this study are consistent with existing literature on the effectiveness of interactive and reflective learning strategies in enhancing critical thinking skills. The significant improvement in the experimental group's critical thinking scores mirrors the results obtained by [1], who demonstrated that video-based instruction fosters metacognitive awareness and analytical abilities. Likewise, [6] reported that interactive video tools yielded better critical thinking outcomes than static learning modules.

Additionally, this study aligns with the work of [8], who found that reflective self-assessment through video analysis enhanced students' critical interpretation in dance education. [7] also concluded that reflective video analysis strengthened student engagement and supported deeper conceptual understanding in contemporary dance courses. What distinguishes the present study is its focus on high school students and traditional Indonesian dance, providing empirical evidence that such interactive techniques are equally beneficial in non-Western, culturally rich dance settings. The results not only validate previous research but also extend its implications to new pedagogical contexts and age groups.

6. Conclusions

This study concludes that interactive learning in traditional dance education significantly improves senior high school students' critical thinking skills. Quantitative findings demonstrated that students in the experimental group, who experienced interactive and reflective learning methods, showed greater improvements in their posttest scores and gain scores compared to those in the control group. Statistical analysis confirmed the significance of these improvements ($p < 0.05$). Moreover, qualitative observations and student responses further validated that the integration of video-based analysis, peer discussions, and symbolic interpretation activities increased student engagement and triggered higher-order thinking. These results support the growing body of literature that emphasizes the pedagogical value of interactive media and reflective teaching in fostering critical thinking.

The findings also highlight the untapped potential of traditional arts education, particularly dance, as a platform for cognitive development beyond aesthetics. Interactive learning can transform dance classes into dynamic spaces for cultural interpretation, personal reflection, and analytical reasoning.

Future research is recommended to explore the long-term effects of such interventions, expand to different cultural dance forms, and integrate more diverse technological tools. Educators are encouraged to adopt similar strategies to maximize both the artistic and intellectual growth of their students.

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