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Development of interactive media for traditional music learning to foster students' critical reflection

Ilham Saputra[1], Indar Sabri[2], Welly Suryandoko[3], Retnayu Prasetyanti Sekti[4], Trisakti[5], Warih Handayaningrum[6]
[1,2,3,4,5,6]Universitas Negeri Surabaya, Kota Surabaya, Indonesia
ilhamsaputra.seni@gmail.com[1], indarsabri@unesa.ac.id[2], wellysuryandoko@unesa.ac.id[3], retnayusekti@unesa.ac.id[4], trisakti@unesa.ac.id[5], warihhandayaningrum@unesa.ac.id[6]

ABSTRACT
The limited familiarity of students with local culture, especially the traditional musical instrument Thuk-thuk, and the lack of contextual interactive learning media motivated this study. The goal was to develop an interactive instructional video based on local culture to improve the critical thinking skills of eighth-grade students in Bangkalan Regency. Using the ADDIE model (Analyze, Design, Develop, Implement, Evaluate), the research combined interactive digital media, local content, and critical thinking indicators from the Paul & Elder framework. Findings revealed most students were unfamiliar with the Thuk-thuk, and suitable learning resources were rare. The video was created to meet the Merdeka Curriculum's learning goals. Expert validation in subject matter, media, and language confirmed its high quality. Implementation in two classes showed a moderate but statistically significant improvement in students' critical thinking skills. Besides delivering content visually and auditorily, the video encourages active engagement in analysis and evaluation while promoting the preservation of local culture. Thus, this video serves as an innovative and effective teaching tool for Cultural Arts education.

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ABSTRAK
Kurangnya pengenalan peserta didik terhadap budaya lokal, khususnya alat musik tradisional Thuk-thuk, serta terbatasnya media pembelajaran interaktif yang kontekstual menjadi latar belakang penelitian ini. Penelitian ini bertujuan mengembangkan video pembelajaran interaktif berbasis budaya lokal untuk meningkatkan kemampuan berpikir kritis peserta didik kelas VIII SMP di Kabupaten Bangkalan. Dengan menggunakan model pengembangan ADDIE (Analyze, Design, Develop, Implement, Evaluate), penelitian mengintegrasikan media digital interaktif, konten lokal, dan indikator berpikir kritis berdasarkan kerangka Paul & Elder. Hasil analisis menunjukkan sebagian besar peserta didik belum mengenal Thuk-thuk dan media pembelajaran yang ada masih sangat terbatas. Video pembelajaran dirancang sesuai capaian Kurikulum Merdeka dan divalidasi oleh ahli materi, media, serta bahasa dengan hasil sangat layak digunakan. Implementasi pada dua kelas menunjukkan peningkatan signifikan dalam kemampuan berpikir kritis peserta didik, dengan kategori sedang menurut uji statistik. Video ini tidak hanya menyampaikan materi secara visual dan auditif, tetapi juga mendorong keterlibatan aktif peserta didik dalam analisis, evaluasi, serta pelestarian budaya lokal. Dengan demikian, video ini menjadi media ajar yang inovatif, efektif, dan kontekstual untuk pembelajaran Seni Budaya.
Kata Kunci: *berpikir kritis; budaya lokal; Thuk-thuk; video pembelajaran interaktif*

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INTRODUCTION

The digital era has driven a major transformation in the field of education, particularly in learning processes that increasingly utilize technology. Educational technology has been proven to enhance the productivity and effectiveness of learning, as well as accelerate access to relevant learning resources (Purba & Saragih, 2023). One widely used form of technology in learning activities is video media. Video media offers advantages in presenting material both visually and auditorily, and is capable of conveying factual and concrete information. These strengths are highly aligned with the needs of skill-based learning. Moreover, instructional videos have also been shown to be effective in helping learners understand complex concepts through engaging visual displays and clear narration (Zahroh *et al*., 2025).

Nevertheless, conventional instructional videos tend to be one-way and passive. The lack of active participation from learners can lead to reduced focus, decreased learning motivation, and a sense of boredom during the learning process (Khaira *et al*., 2023; Khasanah & Rigianti, 2023).To address this issue, interactive learning media has emerged as a more effective solution by providing two-way interaction and allowing learners to engage directly with the presented material (Karna *et al*., 2025). Interactive media is designed to respond to user input and encourage active learner engagement, in line with the principles of multimedia learning developed by Mayer and continuously adapted to the context of modern digital education (Aisyah *et al*., 2025; Rosyiddin *et al*., 2023). Recent studies also show that the use of video-based interactive media significantly enhances knowledge retention and learning motivation (Hadiapurwa *et al*., 2021; Kusnadi & Azzahra, 2024; Purnomo *et al*., 2024)). Interactivity in digital media creates a more personal and meaningful learning experience (Zahroh *et al*., 2025). This is highly relevant for twenty-first century learning, which demands active engagement and learner autonomy.

Previous research has shown that the use of interactive media also contributes to the improvement of students' critical thinking skills. Interactive media based on metacognitive strategies has been proven to significantly enhance students' abilities in analysis and evaluation (Hendi *et al*., 2020). Interactive videos designed around independent learning pathways have also been effective in developing critical thinking skills in science education (Suminar, 2022). However, there is still limited research that specifically focuses on the development of interactive instructional videos based on local wisdom within the context of arts and culture, particularly regional music traditions.

Local cultural heritage, such as the traditional musical instrument *Thuk-thuk* (aghurdhag music) from Bangkalan Regency, is a valuable asset that must be preserved through educational pathways. Preliminary surveys indicate that 91 percent of eighth-grade students in Bangkalan junior high schools are unfamiliar with this instrument, highlighting a low level of cultural literacy among the younger generation. In fact, under the Merdeka Curriculum, music education is designed not only to develop musicality but also to foster sensitivity toward social and cultural phenomena in the surrounding environment, in accordance with the statement from the Educational Standards, Curriculum, and Assessment Agency (BSKAP) of the Ministry of Education, Culture, Research, and Technology in 2022. *Thuk-thuk* traditional music is considered important to be revitalized as part of regional cultural preservation efforts (Yonantha, 2024).

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The scientific novelty of this study lies in the development of interactive instructional videos based on the local *Thuk-thuk* musical tradition, which are specifically designed not only as informational media but also as tools to promote student engagement in critical thinking through HOTS assessment, interactivity, and cultural preservation projects. The development process follows the systematic ADDIE approach and is integrated with the learning outcomes of the Merdeka Curriculum for Phase D. The objective of this study is to describe the development process and evaluate the effectiveness of the interactive instructional video on the traditional *Thuk-thuk* musical instrument in enhancing the critical thinking skills of eighth-grade junior high school students.

LITERATURE REVIEW

The Role of Technology in Learning

Digital technology has revolutionized education by providing more efficient and engaging ways to deliver instructional content. In the context of twenty-first century learning, technology enables interactive multimedia approaches that expand opportunities for active student participation and deepen their learning experiences (Purba & Saragih, 2023). One of the most relevant forms of media is instructional video, due to its ability to combine visual and auditory elements, thereby enhancing interest and learning motivation (Agustini & Ngarti, 2020; Isnaini *et al*., 2023; Kurnia & Sunaryati, 2023). These findings support the use of video as the primary medium in this study and explain why technology-based media can have a positive impact on students' learning processes.

Interactive Video in Enhancing Critical Thinking

Unlike conventional videos, interactive videos provide space for learners to actively engage with the material, receive immediate feedback, and tailor the learning experience to their individual needs (Karna *et al*., 2025). This medium has been empirically proven to support the development of students' critical thinking skills through processes of analysis, evaluation, and creation (Fadiyah *et al*., 2024; Septi *et al*., 2022). These findings align with the use of critical thinking indicators in this study and can be used to explain the improvement in critical thinking skills as a result of student interaction with the developed video. In addition, videos based on metacognitive strategies also foster learners' reflective awareness of the instructional content (Hendi *et al*., 2020). These findings strengthen the argument that reflection-based approaches are effective in stimulating higher-order thinking.

Arts Education and the Preservation of Traditional Music

Arts and culture education plays a significant role in strengthening character, fostering social sensitivity, and preserving cultural identity. In local contexts such as Bangkalan, the integration of traditional musical instruments like *Thuk-thuk* into classroom instruction represents a strategic effort to combine students' cognitive and affective domains (Yonantha, 2024). The *Merdeka Curriculum* itself emphasizes the importance of learning that is socially and culturally meaningful. This framework is relevant in supporting the contextualization of

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instructional media and serves as a foundation for interpreting why students become more engaged and motivated when learning is connected to their local cultural heritage.

The ADDIE Model in Instructional Media Development

ADDIE is a systematic and flexible model for designing effective instructional media. It is particularly well-suited for developing 21st-century multimedia learning tools, as each of its phases Analysis, Design, Development, Implementation, and Evaluation forms a structured framework that is responsive to instructional needs. The application of ADDIE in developing interactive media using Adobe Animate has resulted in highly feasible products for classroom use, (Shaquille & Parga Zen, 2023). Furthermore, the use of the ADDIE model in augmented reality based media has been shown to enhance learning quality through a user centered approach (Atikah *et al*., 2023). Media development through ADDIE enables more targeted and measurable learning outcomes, in line with Sadiman et al.'s assertion in their book Educational Media: Definition, Development, and Utilization. Therefore, in this study, the ADDIE model provides a logical and methodological framework for producing instructional media that is valid, feasible, and impactful in improving learning achievement.

Critical Thinking as a 21st-Century Competency

Critical thinking is a core competency essential for navigating the rapid flow of information and the complexities of modern life. Instruction grounded in explicit teaching methods has been shown to significantly enhance this skill, particularly in activities involving reading and argumentative writing (Rouijel *et al*., 2019; Zhang *et al*., 2023). Studies also highlight that evaluation rubrics based on intellectual standards enable learners to assess and refine their thinking in a more structured and intentional manner (Johnson *et al*., 2022). This theoretical foundation supports the use of critical thinking indicators derived from the Paul and Elder framework in this study, and provides a basis for interpreting the observed improvement in students' critical thinking skills following the instructional video intervention.

METHODS

This study employs a qualitative approach using a modified ADDIE development model, which consists of five key phases: analysis, design, development, implementation, and evaluation, in accordance with Sadiman et al.'s framework outlined in their book *Educational Media: Definition, Development, and Utilization*. The research process from beginning to end is outlined as follows.

Analysis

Initial data were collected through interviews with subject teachers and a survey involving one thousand students. The aim was to identify instructional needs and recognize issues related to the lack of familiarity with the traditional musical instrument *Thuk-thuk*. The results of this analysis served as the foundation for planning the development of instructional media.

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Design

Learning objectives were formulated alongside instructional materials aligned with the *Merdeka Curriculum*, and critical thinking indicators were constructed based on the Paul and Elder framework. A storyboard was developed, along with evaluation instruments in the form of questionnaires and critical thinking tests.

Development

An interactive instructional video rooted in local cultural elements was developed, integrating visual content, audio, and interactive features. Media validation was conducted by three experts (subject matter, media, and language) using a Likert-scale questionnaire. Validation data were analyzed by converting scores into feasibility percentages.

Implementation

A limited trial was conducted in two classes VIII-D and VIII-F at SMP Negeri 2 Bangkalan, involving a total of 64 students selected through purposive sampling. Pretest and posttest instruments were used to measure the improvement in students' critical thinking skills following the use of the interactive video.

Evaluation

Learning outcome data were analyzed using the N-Gain formula to assess score improvement. A paired t-test was conducted to examine the significance of the increase in critical thinking skills before and after the intervention. The evaluation also included reflections on the strengths and weaknesses of the media, based on feedback from students and teachers.

RESULTS AND DISCUSSION

The development of an interactive instructional video featuring the traditional musical instrument *Thuk-thuk* aimed to enhance the critical thinking skills of eighth grade junior high school students. The process employed the ADDIE development model, which follows a cyclical sequence of Analysis, Design, Development, Implementation, Evaluation, and a return to Analysis.

Analyze Phase

The analysis phase in developing the interactive instructional video on the traditional musical instrument *Thuk-thuk* began with identifying instructional needs. Discussions with five junior high school Arts and Culture teachers in Bangkalan revealed that *Thuk-thuk* had never been taught comprehensively due to limited learning resources and the unavailability of

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instruments. A survey of 1,000 eighth-grade students showed that 91% were unfamiliar with the *Thuk-thuk* instrument. Curriculum analysis using the ATP for Phase D at SMPN 2 Bangkalan emphasized five dimensions of learning: experiencing, reflecting, engaging in artistic work, creating, and making an impact.

Material analysis showed that the video must present subtopics on the history and development, form, playing techniques, performance, and preservation of T*huk-thuk*, using audio visual media so that students can directly see and hear the instrument. The video was developed on an interactive platform (such as Quizizz) to overcome the limitations of conventional one way videos. Learner characteristics analysis of class VIII-D and VIII-F showed that all students had access to smartphones, were interested in digital media, but had low initial competence in recognizing *Thuk-thuk* and in critical thinking. Therefore, the video was developed to match visual-auditory learning styles with direct engagement. Assessment analysis was designed to measure the achievement of critical thinking skills through HOTS questions (C2–C6) and project-based assignments referring to the seven intellectual standards of critical thinking according to Paul and Elder.

The above condition aligns with research indicating that 87% of arts teachers in East Java experience difficulties in teaching traditional music due to the lack of digital learning resources and limited availability of musical instruments in schools (Mukti & Fathurrahman, 2023). This highlights a knowledge gap and a lack of student motivation toward local cultural heritage. Media development was carried out interactively so that students not only gain cognitive understanding but also develop critical thinking skills and contribute to the preservation of local culture (Amelia *et al*., 2025).

Design Phase

In this phase, the first step taken was to determine specific learning objectives based on the Learning Objective Flow (ATP) of the *Merdeka Curriculum* Phase D. The general objective was divided into seven specific learning objectives with cognitive levels ranging from C2 to C6, such as: explaining the history of the *Thuk-thuk* musical instrument (C2), analyzing playing techniques (C4), evaluating performance (C5), and creating a cultural preservation campaign project (C6). This formulation aligns with the dimensions of arts learning, namely: Reflecting, Artistic Thinking, and Making an Impact

The next step was to design the assessment strategy. Each learning objective was measured using HOTS-based questions, including contextual multiple-choice items with reading illustrations and analytical essay questions. The assessment strategy was integrated with the seven intellectual standards of critical thinking from Paul and Elder (Clarity, Accuracy, Precision, Relevance, Depth, Breadth, and Logic), allowing for evaluation not only of basic cognitive aspects but also of students' abilities in analysis, synthesis, and evaluation.

For example, to assess the objective of creating a cultural preservation campaign, the assessment took the form of tangible products such as posters, infographics, articles, or campaign videos. Following this, instructional content was determined according to the learning objectives. The main material was divided into three subtopics: (1) History, function, development, and types of *Thuk-thuk* ; (2) Playing techniques and performance; (3) Preservation efforts. Each subtopic incorporated elements of appreciation and creation, in

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line with the characteristics of arts and culture learning. The development of this material also considered the local context of Bangkalan and the potential for implementing cultural practices.

To ensure the integration of content and media, a Media Content Outline (Garis Besar Isi Media/GBIM) and Detailed Material Breakdown (Jabaran Materi/JM) were developed. The GBIM includes components such as specific learning objectives (TPK), subtopics, main content, types of exercises/tests, and media formats (video, audio, text, animation). For example, in the topic of playing techniques, students are asked to analyze rhythmic patterns in the Klapayan style using audiovisual examples. Meanwhile, in the topic of preservation, students develop campaign ideas using digital products. The GBIM serves as the initial blueprint for drafting the instructional video scenario and storyboard. The JM provides a more detailed breakdown of content, narration, supporting data, and visual/audio illustrations. For instance, in the subtopic on history, it is explained that *Thuk-thuk* evolved from the tradition of accompanying *karapan sapi* (bull races) in the 18th century and consists of five main instruments (Pangorbih, Paneros, Pancer, Tol, and Tak Katek), made from jackfruit or teak wood. This information is presented through historical visuals, instrument illustrations, and quotes from local sources. Overall, this design phase produced a framework for instructional video that not only delivers information in an engaging and contextual manner, but also fosters active participation, reflection on local culture, and the enhancement of students' critical thinking skills.

The design of this strategy aligns with research stating that the use of HOTS questions and project-based assignments has been proven to enhance students' critical thinking skills in school subjects (Sari & Suprijono, 2022).Contextual and culturally rooted instructional materials can improve students' absorption of content and strengthen emotional attachment to cultural heritage (Putra *et al*., 2025). Aesthetic elements in instructional media also contribute to a unique spiritual experience for students, which in turn reinforces their understanding and critical thinking toward cultural heritage (Pradnyani, 2024).

Develop Phase

In the pre production stage, various technical and non technical preparations were carried out to ensure the smooth production of the video. Activities began with a script review session involving the cameraman and technicians at two locations (Studio Cloud and Sanggar Tarara) to align perceptions regarding the visualization of the script. Casting was conducted in collaboration with the Head of Sanggar Tarara, involving five *Thuk-thuk* musicians and the researcher as the presenter.

The estimated production cost was Rp. 3,950,000, itemized for production services, performer honorariums, meals, and equipment. Location surveys were conducted to ensure optimal visual and audio quality, as well as production comfort. Rehearsals were carried out independently by the presenter and directly by the musicians at the studio, focusing on playing techniques and tempo. The production schedule was collectively agreed upon, with presenter shooting on January 17, 2025, at Studio Cloud and musician footage recorded on January 19, 2025, at Sanggar Tarara.

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During the production phase, the video was recorded according to the schedule and script. The presenter's shooting produced several visual assets aligned with the instructional flow. The musicians' shooting focused on the playing techniques of the Thuk-thuk instrument, including player blocking, camera setup, and evaluation through playback. The production results included visual assets of the instruments, individual and group playing techniques, and performance expressions. Additional assets were sourced from platforms such as YouTube, Facebook, and Canva to enrich the visual content. The post-production phase was carried out at Studio Cloud from January 23 to 25, 2025, using Adobe Premiere Pro. This phase included asset integration, transition arrangement, animation, and text editing. The final video was divided into two parts and uploaded to YouTube. Subsequently, the video was transformed into an interactive format using the Quizizz platform by adding HOTS questions, reflection prompts, and learning readiness surveys, enabling a more active, evaluative, and responsive learning experience tailored to student characteristics.

The expert validation phase was a crucial part of developing the interactive instructional video on *Thuk-thuk*, aimed at ensuring content accuracy, media effectiveness, and language appropriateness. Validation was conducted by three experts: a subject matter expert, a media expert, and a language expert. The subject matter expert provided input on content, such as replacing historical visuals for greater validity, revising local terms like "*Pangorbih/gudhug*" to be more representative for students in Bangkalan, and correcting technical errors in the pronunciation of "tek" and "tuk," which had been mistakenly interchanged. Validation was carried out in two stages: during script evaluation and after the video was produced. From the media perspective, the media expert highlighted technical aspects of editing, such as transitions between scenes that lacked smoothness, the need to add animations (arrows, question marks), and replacing backgrounds that distracted students' focus. These suggestions were implemented to enhance visual quality and video flow.Meanwhile, the language expert emphasized improvements to non-standard sentences used in interactive questions and refinements to the text display in the video to visually reinforce the presenter's delivery. After all feedback was applied, the revised video was uploaded to YouTube and integrated into the Quizizz platform as an interactive video, accessible via the following link.

1. s.id/thukthuk-1-quizizz
2. s.id/thukthuk-2-quizizz

The results of media development based on input from the validators can be seen in Figures 1 and 2.

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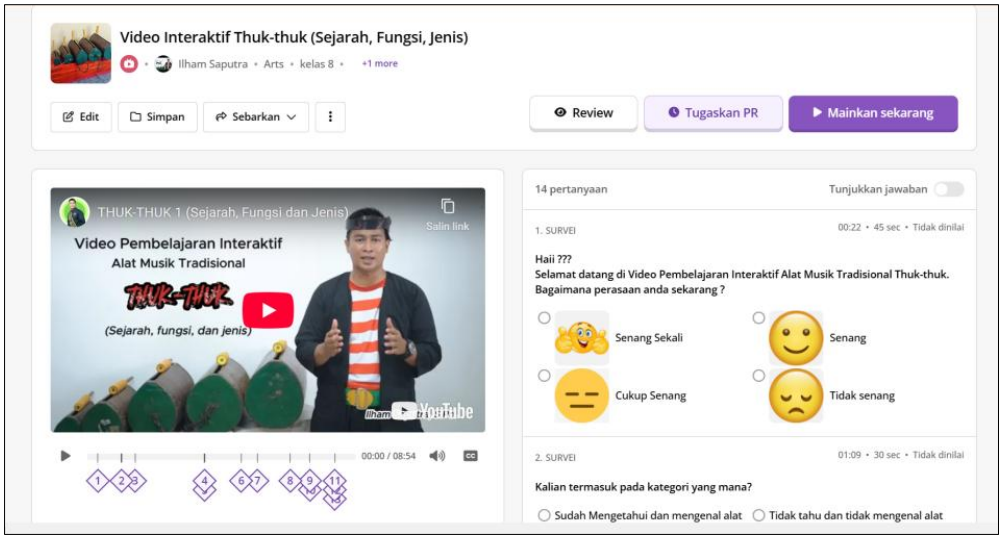

Figure 1: Video 1 on the *Quizizz Platform*
Source: Author's Documentation, 2025

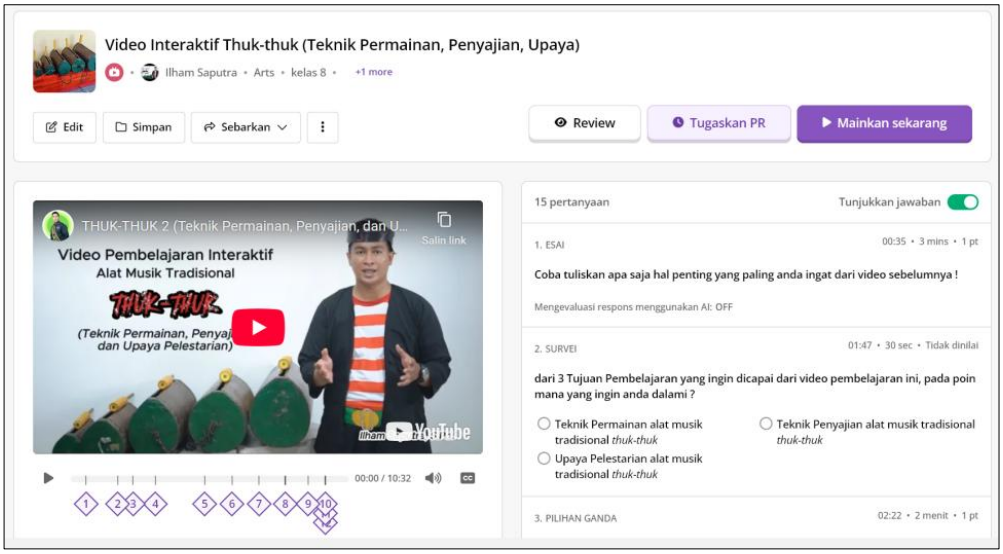

Figure 2: Video 2 on the *Quizizz Platform*
Source : Author's Documentation, 2025

Essentially, expert validation and user trials are crucial steps in producing optimal, effective, and contextually appropriate learning media (Rosita, 2015). Effective instructional media must undergo a tiered process of validation, testing, and revision to align with learners' characteristics (Sadiman *et al*., 2020). The integration of interactive elements such as Quizizz has been proven to enhance learners' retention and motivation compared to conventional media (Azizah *et al*., 2023).

Implementation Phase

The implementation phase aimed to evaluate the effectiveness of the interactive *Thuk-thuk* learning video through a limited trial conducted in two classes 8-D and 8-F at SMPN 2 Bangkalan each consisting of 32 students. The activity began with a pretest administered on

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February 10, 2025. The pretest comprised 20 multiple-choice questions via Google Form and 5 paper-based HOTS (Higher Order Thinking Skills) essay questions, conducted after students watched the earlier, undeveloped version of the *Thuk-thuk* learning video. The purpose of the pretest was to assess students' initial understanding of the material and their critical thinking skills. The activity was facilitated by two different teachers: Ms. EA (class 8-D) and Ms. Km (class 8-F), who also provided assessments of the students' respons.

Subsequently, the learning activities were carried out over three sessions (February 17 & 24 and March 10, 2025), utilizing two developed versions of the interactive *Thuk-thuk* learning videos. Each session facilitated a range of activities, including video viewing, group discussions, presentations, musical instrument practice, and social media content creation as a form of cultural preservation. The learning process was highly active, with students using earphones during video viewing and taking turns playing the *Thuk-thuk* musical instrument. Following the instructional sessions, a posttest was administered on March 17, 2025, using the same instruments as the pretest. The purpose of the posttest was to measure students' improvement in understanding and critical thinking skills after engaging with the interactive learning media.

The posttest results served as the primary basis for evaluating the effectiveness of the developed learning media. The increase in posttest scores following the interactive learning sessions aligns with previous research indicating that the use of locally based art learning videos can enhance learning outcomes (Yasmin *et al*., 2024). Furthermore, learning media perceived as unique and novel are inherently effective in improving students' focus, which in turn contributes to better academic performance (Fidarti & Nurhaini, 2023).

Evaluation Phase

The evaluation stage within the ADDIE model is comprehensive and conducted throughout each phase of development Analyze, Design, Develop, and Implement. During the analysis phase, evaluation includes identifying instructional problems, assessing the relevance of *Thuk-thuk* content to the Merdeka Curriculum, and determining the feasibility of visualizing the material in video format. It also examines the alignment between learning indicators and the assessments to be used. Additionally, learner characteristics such as learning styles, critical thinking abilities, and access to technological devices are considered to ensure that the developed media is both targeted and equitably accessible. In the design phase, evaluation focuses on the clarity of learning objectives, logical structure of the content, and the feasibility of the delivery sequence. The content, media, and Material Breakdown (Jabaran Materi) are reviewed to match students' comprehension levels. The development phase involves layered evaluation, including script revisions, production quality checks, and final assessments by subject matter, media, and language experts. Key aspects evaluated include content accuracy, graphic and audio quality, and the integration of interactive elements. Finally, during the implementation phase, evaluation is conducted on the pretest instruments and learning modules, which are validated by resource persons to ensure that the instructional activities proceed as intended. This continuous evaluation process ensures that the developed media is not only technically sound but also pedagogically effective.

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The development of the interactive *Thuk-thuk* traditional music learning video using the ADDIE model demonstrated that the video is highly suitable for use as instructional media in Grade VIII Cultural Arts classes at the junior high school level. Validation was conducted in two stages by experts in content, media, and language. For the content aspect, evaluations focused on accuracy, completeness, and relevance. Revisions included adjustments to historical details and local terminology to enhance substantive quality, resulting in a final score of 94.74%, indicating that the content is highly appropriate. In terms of media, assessments covered visuals, audio, transitions, and interactive elements. Significant improvements were made in visual consistency and quiz integration, yielding a final score of 95.91%, which reflects strong technical and communicative effectiveness. Language validation emphasized sentence structure refinement and narrative clarity, producing a score of 94%, indicating that the language used is appropriate and easily understood by students.

Beyond expert validation, responses from educational practitioners and students also yielded positive results. Two Cultural Arts teachers provided an average score of 94.85%, evaluating the video as effective, enjoyable, and aligned with curriculum requirements. A trial involving 32 Grade VIII-D students resulted in a score of 89.4%, indicating that the video was engaging, easy to comprehend, and capable of enhancing enthusiasm and learning participation. Interactive features such as quizzes and reflection activities were identified as key attractions. With all validation and trial components scoring above 89%, the video is proven to be feasible and is recommended as a digital instructional medium that not only supports the preservation of local culture but also enhances students' contextual critical thinking skills in an enjoyable and meaningful way.

Overall, the media validation scores exceeded 89%, aligning with previous research which emphasizes that expert validation and student trials are essential in determining the feasibility standards of instructional media for secondary education. Learning media that are new, innovative, and user-friendly are considered appropriate for current educational developments (Astuti *et al*., 2020). Ultimately, this activity aimed to assess the quality of the media to ensure its effectiveness in classroom instruction.

Discussion

The development of the interactive learning video featuring the traditional musical instrument *Thuk-thuk* demonstrates that the media is highly suitable for use in Grade VIII Cultural Arts instruction. The development process was based on the ADDIE model, which is widely adopted in instructional product design due to its systematic and flexible implementation (Sadiman *et al*., 2020). This process began with identifying instructional needs, revealing students' limited knowledge of local traditional music, followed by content preparation, interactive media design, and expert validation across multiple aspects. The resulting video was packaged using the Quizizz platform, enabling students to engage actively through quiz and reflection features, in line with the principles of interactive digital learning (Karna *et al*., 2025).

Validation results from three experts indicated that the media achieved a very high level of feasibility. The content aspect received a score of 94.74%, the media aspect 95.91%, and the language aspect 94%. Teachers provided an average rating of 94.85%, while students

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responded with a score of 89.4%, indicating that the media is effective, easy to understand, and engaging. These findings are consistent with previous research showing that interactive video-based learning media can enhance students' comprehension and foster learning interest (Isnaini *et al*., 2023). The developed media not only serves to deliver information but also stimulates student participation in discussions and analysis related to local cultural preservation issues.

In terms of effectiveness, the pretest results indicated that students' critical thinking skills were relatively low, with an average score of 51.35. After participating in the learning sessions using the interactive video, the score increased to 78.27. The N-Gain value of 0.54 indicates a moderate level of improvement, and the t-test showed statistical significance at $p = 0.001$. These findings suggest that the use of the media contributed significantly to the enhancement of students' critical thinking abilities. This result is further supported by evidence that interactive media based on metacognitive strategies is effective in improving students' higher-order thinking skills (Hendi *et al*., 2020).

The presence of interactive elements in the video plays a crucial role in fostering a learning process that is not merely passive, but one that encourages students to evaluate, reflect, and make decisions based on the information received. Media interactivity has been shown to enhance student engagement and active participation in the learning process (Fadiyah *et al*., 2024; Septi *et al*., 2022). The cognitive, affective, and compensatory functions of media are reflected in this learning tool through visuals that support information processing, narratives that evoke emotional responses, and features that accommodate diverse learning styles. Schrader et al., in *Motivation and Affect in Multimedia Learning*, emphasize that in the cognitive domain, multimedia design facilitates the selection and integration of information, thereby enhancing deep understanding and long-term memory retention (Huang *et al*., 2022). From the affective perspective, emotionally driven design elements such as visual cues and enthusiastic narration—boost motivation and contribute to a positive learning experience (Wang *et al*., 2023). Meanwhile, the compensatory aspect is evident in how multimedia content design adjusts cognitive load and addresses diverse learning challenges, for example, through local-global adaptation in information structure, which expands material accessibility for students with varied learning profiles (Liew *et al*., 2022).

The inclusion of local content in the form of the *Thuk-thuk* traditional musical instrument rarely introduced in classroom settings adds significant value to the developed media. Its visual and auditory presentation enables students not only to grasp the concept cognitively but also to cultivate awareness and appreciation for local cultural preservation. This aligns with the goals of the *Merdeka Curriculum*, which emphasizes contextual, reflective, and impactful learning. Therefore, the interactive *Thuk-thuk* learning video is deemed feasible and effective as an innovative instructional medium that supports academic achievement while also fostering students' character development and cultural identity.

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CONCLUSION

The development of an interactive learning video based on local culture, specifically the traditional musical instrument *Thuk-thuk* using the ADDIE model has been declared feasible and effective for use in Grade VIII Cultural Arts instruction at the junior high school level. The development process included needs analysis, instructional goal and content design, interactive video production, expert validation, and limited classroom implementation. Validation results indicated a very high level of feasibility across content, media, and language aspects. Teacher evaluations and student feedback further confirmed that the learning video is engaging, user-friendly, and well-suited to classroom instructional needs.

Quantitatively, the effectiveness of the media is reflected in the significant improvement of students' critical thinking skills, as indicated by the increase in posttest scores. The N-Gain value falls within the moderate category, and the t-test results show statistically significant differences. The integration of interactive elements in the video has proven to foster active student engagement and deepen their understanding of local cultural values. This aligns with the spirit of the *Merdeka Curriculum*, which emphasizes contextual and impactful learning. Therefore, the research objective to develop interactive learning media based on local culture to enhance students' critical thinking skills has been successfully achieved. The learning video is recommended as an innovative alternative instructional medium.

AUTHOR'S NOTE

The author declares that there is no conflict of interest related to the publication of this article. The author affirms that the data and content presented in the article are free from plagiarism.

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