

# Development of PETAMUSI Media Integrated with Dance Education to Improve the Natural and Social Sciences Learning Outcomes of Fifth-Grade Students

Alma Putri Noorkhalisha\*, Deasylina da Ary<sup>ID</sup>

Universitas Negeri Semarang, Sekaran St., Semarang, Central Java, 50229, Indonesia

\*Corresponding author, email: [almaputrinorkhalisha@gmail.com](mailto:almaputrinorkhalisha@gmail.com)

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## Abstract

This research aims to develop, assess its feasibility, and test the effectiveness of the PETAMUSI (*Peta Musik Tradisi*/ Traditional Music Map) media, which integrates dance arts, for fifth-grade natural and social sciences learning. The method used is R&D with the ADDIE model. This research was conducted in the fifth-grade class. The stages are analyze, design, development, implementation, and evaluation. Data collection techniques include observation, interviews, questionnaires, documentation, and pretests and posttests. Data analysis uses normality tests, t-tests, and N-Gain tests to measure effectiveness. The novelty of PETAMUSI lies in combining flashcards and a map of Indonesia with barcodes that contain traditional Indonesian music integrated with dance art. The average score on the pretest was 36.62, while the average score on the posttest increased to 84.74. With that data, the average increase in learning outcomes was 48.42. The validation results by dance material experts, social studies material experts, and media experts indicate that the PETAMUSI media falls into the very feasible category after one revision. The t-test results show a value of  $< 0.001$ ; thus, it can be concluded that there is an effect. It can be concluded that the PETAMUSI media, which integrates dance art to improve the learning outcomes of fifth-grade natural and social sciences learning students, is suitable and effective, as evidenced by increased activity and learning outcomes during the teaching process.

## 1. Introduction

Natural and social sciences is a subject that integrates concepts from the natural and social sciences to help students understand the phenomena occurring around them. It is hoped that this integration of concepts will strengthen multicultural education and foster a better understanding of natural and social conditions in Indonesia and around the world (Zakarina et al., 2024). One of the topics studied in the 5th grade of elementary school is traditional music, which is part of Indonesia's cultural diversity and cultural heritage. By studying this material, which covers various types of traditional music in Indonesia, students are expected to recognize and preserve Indonesia's cultural diversity in their immediate surroundings.

Anything that conveys information or learning messages to students is called learning media. This media can take the form of concrete or visual media. Media whose objects are physical in nature, that is, can be observed, touched, and manipulated directly by students to help them understand learning concepts, are called concrete media. The use of concrete media allows students to explore physical objects through sensory input received by the skin and the movement of their limbs (Justo et al., 2022). The use of concrete media in learning has been shown to improve student academic achievement (Farra et al., 2024).

Maps are an important example of the integration of text, images, and geometry, thereby supporting the spatialization of knowledge (von Schmettau et al., 2026). Maps help students understand the elements of their surroundings or the places they visit in a clearer, more visual way. Meanwhile, flashcards are cards containing images, statements, or questions related to a specific topic and are used in educational games. The use of flashcards can improve students' memory and increase their engagement in the learning process (Ophuis-Cox et al., 2023). On the other hand, dance education is a form of education that utilizes physical expression and activity and can be integrated into various subjects. Dance education reflects general practices and values (Foster & Turkki, 2023). By combining maps and flashcards with dance, learning can be tailored to students' diverse learning styles. Maps and flashcards are used to facilitate and reinforce conceptual understanding, while dance provides hands-on learning experiences through physical activity. Through these three approaches, students can have interactive, enjoyable, and meaningful learning experiences.

According to several previous studies, the use of maps and flashcards in the classroom is effective in helping students understand social and cultural concepts. Maps promote understanding of ethnic and cultural diversity through visual representations; flashcards reinforce retention of learning material during the learning process (Adini et al., 2022; Kristi et al., 2024; Okdiansyah et al., 2021; Hayati, 2021). These studies adopted a research and development (R&D) approach based on the ADDIE model and reported positive results regarding the potential and effectiveness of these materials. In general, the use of maps and flashcards in the learning process is considered a way to encourage students' active participation through interactive learning experiences and to improve their academic achievement.

Numerous studies have demonstrated that instructional media can improve student learning outcomes. However, most previous research has focused primarily on cognitive aspects and has not sufficiently supported diverse learning styles, such as visual, auditory, and kinesthetic. In reality, every student has a unique learning style, so instructional media is needed that not only supports understanding of the material but also fosters students' creativity. Furthermore, the application of dance as an academic discipline integrated into other subjects is still rarely found in teaching practice or previous research. In fact, dance in education is not limited to the study of traditional dance but can also serve as an enjoyable learning tool within the context of natural and social sciences instruction. Previous research has also primarily focused on topics such as cultural diversity and thematic learning. Meanwhile, research on learning media that integrate dance with traditional music in natural and social sciences instruction remains limited. Therefore, this study introduces a new concept by integrating dance with maps and flashcards in the learning process.

The initial observation was conducted on March 8, 2025, in the fifth grade at one of public elementary school at Tegal, Indonesia. This activity consisted of interviews, observations, and documentation during the natural and social sciences subject's learning process with 19 students and 1 class teacher. Based on initial interviews and observations with the fifth-grade teacher, issues were identified during the learning process, namely the lack of use of learning media and the lack of active student involvement. Learning still relies on the teacher's lecture method, which easily bores students and, as a result, does not fully achieve the learning objectives. Based on these findings, the main objective of this development research is to design and develop concrete learning media, test the feasibility and effectiveness of the media, and improve student learning outcomes by integrating dance art into the PETAMUSI media for the natural and social sciences subject on the material "Traditional Music" in the fifth grade. The developed media is expected to enhance student learning outcomes in several ways: by enabling learning through play, making the learning process more enjoyable, and helping students better understand the material.

## 2. Method

This research is an R&D (Research and Development) study aimed at developing and producing a specific product for use in education and other areas. According to Sugiyono (2023) The research and development method aims to discover, design, and test products that make real contributions to solving field problems. This research uses the ADDIE development model, which consists of Analysis, Design, Development, Implementation, and Evaluation. This model can be used for various forms of product development in learning activities such as models, learning strategies, teaching methods, media, and teaching materials. The research subjects consisted of 19 students. In the research process, the students will be divided into 2 groups: a small-scale group of 6 students and a large-scale group of 13 students. This aims to test the media's practicality, feasibility, and effectiveness.

The data collection techniques used in this study are test techniques and non-test techniques. The test technique uses a pre-test and a post-test. Meanwhile, the non-test techniques used include observation, interviews, questionnaires, and documentation. The test technique aims to measure students' basic competencies. The students' basic abilities can be seen in the learning outcomes before (pre-test) and after (post-test) the use of the developed PETAMUSI learning media. The post-test results will be compared with the pre-test results. The comparison is used to see the effectiveness of using the PETAMUSI learning media in fifth-grade natural and social sciences lessons. The non-test techniques used are observation, interviews with the homeroom teacher and several students, and questionnaires. This research uses unstructured interviews, with the interview guidelines serving only as an outline of the issues to be discussed. This study uses a teacher needs questionnaire, a student needs questionnaire, a content expert validation questionnaire, and a media expert validation questionnaire. A four-point Likert scale (1–4) was used across all instruments, and the scores were converted to percentages using predetermined criteria. The validity of the instruments was assessed by content and media experts, while their reliability was tested in SPSS using Cronbach's alpha (0.729), indicating that the instruments are reliable and suitable for data collection.

The data analysis techniques used are the normality test, t-test, and N-Gain test. The normality test aims to assess the distribution of data within a group or population. The results will show whether the data follows a normal distribution or not (Widodo et al., 2023). The paired sample t-test, or paired two-sample test, aims to determine the difference in learning outcomes before and after the application of media. The N-Gain test is used

to determine the improvement in students' learning outcomes between before and after the treatment using media.

### 3. Results and Discussion

#### 3.1. Results

This research produced a concrete learning media product, namely PETAMUSI (Peta Musik Tradisi), which aims to improve students' learning outcomes in the fifth-grade natural and social sciences learning subject on Traditional Music. The researcher chooses the Research & Development (R&D) approach using the ADDIE model for its development, which consists of five stages, namely:

##### 3.1.1. Analyze

At this stage, the researcher conducted observations and interviews to analyze learning problems in the "Traditional Music" material in the natural and social sciences learning subject. Based on interviews and observations with the fifth-grade teacher, problems were identified during the learning process, namely the lack of use of learning media and the lack of active student involvement. Learning still relies on the teacher's lecture method, which easily bores students and results in fewer learning objectives being achieved. Student books are the primary reference teachers use to teach in the classroom. Additionally, a lack of knowledge of teaching models leads teachers to rely solely on the lecture method, resulting in students merely listening and a lack of reciprocal interaction between teachers and students.

The result of the teacher needs questionnaire also indicate that the "Traditional Music" material is still considered difficult by students due to the variety of traditional music in Indonesia and a lack of understanding of Indonesia's map. To understand the material, students are required to memorize it without any additional media. This situation makes it necessary for students to have new and enjoyable learning media so that their understanding and learning can improve. Next, based on the student needs survey, new learning media are needed to support understanding of the material, in addition to memorization methods. Students also desire new learning media that feels like playing, so the learning atmosphere becomes more enjoyable, which is followed by an increase in students' understanding of the "Traditional Music" material.

Based on the identified problems, the researcher is interested in developing learning media in the form of flashcards and maps to make learning more engaging and enjoyable. This medium can help students understand the material through movement, allowing their creativity to continue. The developed media will be packaged as attractively as possible to encourage student engagement and ensure the material is conveyed effectively.

##### 3.1.2. Design





In this process, the Canva application is used to create map and flashcard media designs in PETAMUSI. Canva is a graphic design application that offers a variety of attractive design options for creating learning media due to its many features (Sholeh et al., 2020). This design includes material on the names and instruments of traditional music, how to play them, and the distinctive icons of the traditional music provinces, which are used in creating flashcard designs. In this design, it is made as attractive as possible with shades of green and cream, along with real images of traditional musical instruments and distinctive provincial icons to enhance students' knowledge and interest. As for the map design, it features 38 Indonesian provinces and a barcode representing traditional musical sounds. In this design, the map of Indonesia's 38 provinces uses different colors and includes the names of each province. The map coloring is also done in shades of green and cream, combined with various colors from each province, to engage students and encourage participation in the learning process.

In the PETAMUSI media, students go through 3 stages: reading and understanding the material on the flashcards, then selecting the target province on the map. This media is used in stages, starting with flashcards and then using the map for the final determination.

##### 3.1.3. Development

In this process, the PETAMUSI media was developed, starting with the creation of flashcards that included the first side featuring the names and traditional musical instruments, how to play traditional music, and the distinctive icons of the traditional music province. The second side contained the media name and the researcher's identity. Then, the creation of a map featuring images of 38 Indonesian provinces and barcodes of traditional music sounds. The arrangement and placement of elements in both flashcard media and maps are adjusted according to students' understanding of how to work, with elements arranged from top to bottom. This aims to ensure that the PETAMUSI media can be well understood, creating a lively and enjoyable learning atmosphere. The revision results of the PETAMUSI media before and after expert validation are presented in Table 1.

**Table 1. Before and After PETAMUSI Media Revision**

PETAMUSI Media Before Revision	PETAMUSI Media After Revision
	
	

The media product test of PETAMUSI was also conducted by the researchers, involving two subject matter experts, namely an expert in dance arts and an expert in social studies, as well as one media expert. These experts provided assessments, suggestions, and further guidance related to the media being developed. During the expert validation test, several revisions were made to ensure that the developed media is optimal and suitable for use in research. In the product validation process, the dance art materials expert suggested adding a barcode to each traditional piece of music so that students can feel the integration of art. The social studies material expert suggested adding clearer images of traditional musical instruments on the flashcards so that students can better understand the material. Meanwhile, the media expert suggested standardizing the font of the PETAMUSI map title used on the PETAMUSI flashcards to ensure the media design appears harmonious and consistent. The validation results from the material experts and media expert are presented in Tables 2 and 3.

**Table 2. Material Expert Validator Results**

Material Validator	Value Obtained	Maximum Value	Percentage	Category
Expert in dance subject matter	42	48	87.5%	Very appropriate
Expert in social studies subject matter	43	48	89%	Very appropriate

**Table 3. Media Expert Validator Results**

Material Validator	Value Obtained	Maximum Value	Percentage	Category
	50	52	96%	Very appropriate

Based on Table 2 and Table 3, it can be seen that the assessment results from the subject matter experts, namely the dance art subject matter expert at 87.5% and the social studies subject matter expert at 89%, as well as the media expert at 96%. With the results of three very feasible criteria, it can be concluded that the PETAMUSI media is appropriate for use in the classroom learning process.

### 3.1.4. Implementation

This stage was conducted on April 11-13, 2026, in the fifth-grade class. Before using the PETAMUSI media, students were given an initial overview of the "Traditional Music" material through an introduction that began

with several traditional musical instruments and then led to the PowerPoint material. Next, a pretest was administered to assess students' initial knowledge of the material. The PETAMUSI media implementation was conducted after the pretest questions, with the researcher's guidance. After understanding and playing with the PETAMUSI media, the students were asked to complete the posttest questions to compare their learning outcomes. Subsequently, the students were asked to fill out a response questionnaire after using the PETAMUSI media.

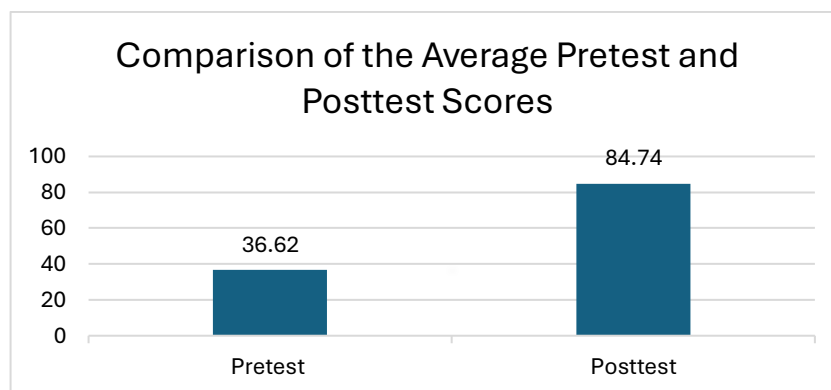


Figure 2. Comparison Diagram of Pretest and Posttest Scores

The pretest and posttest results showed that the average pretest score was 36.62, while the average posttest score increased to 84.74. With this data, the average improvement in learning outcomes was 48.42. This proves that students' learning outcomes on the topic of "Traditional Music" have improved with the PETAMUSI media, indicating its effectiveness in the learning process.

In this process, small-scale and large-scale media trials are conducted. A small-scale media trial involving 6 students was conducted after the product validation test. The normality test, t-test, and N-Gain test are used to measure the effectiveness of the PETAMUSI media using pretest and posttest scores. The results of the normality test are shown in Table 4.

Table 4. Small-Scale Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Small Scale Pre-test	.183	6	.200	.960	6	.820
Small Scale Post-test	.223	6	.200	.908	6	.421

Based on the Table 4, the normality test using the Shapiro-Wilk test on the pretest values shows a significant result of 0.820, and on the posttest values, 0.421. The normality test results are considered normal if the significance value is greater than 0.05. The pretest value test result above shows 0.82, and the posttest value test shows 0.421, indicating that both are normally distributed because the significance values are > 0.05. Next, a paired-samples t-test was conducted, and the results are shown in Table 5.

Table 5. Small-Scale Paired Sample T-Test Results

Paired Differences							
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			
-53.333	12.111	4.944	-66.043	-40.624	-10.787	5	<.001

Based on the table above, Sig. (2-tailed) shows a value of < 0.001, so it can be concluded that there is a significant difference in the average scores between the pretest and posttest, indicating an effect. Next, the final test was conducted in a small-scale trial, namely the N-Gain test, with the results shown in Table 6.

Table 6. Small-Scale N-Gain Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
NGain	6	.57	1.00	.8258	.16240
Valid N (listwise)	6				

Based on the Table 6, the mean N-Gain value of 0.8258, which falls into the high category, indicates an improvement in learning outcomes after using the PETAMUSI media.

Learning with large-scale media trials involving 13 students was conducted after small-scale media trials. The normality test, t-test, and N-Gain test were used to assess the effectiveness of the PETAMUSI media using pretest and posttest scores. The results of the normality test are shown in Table 7.

**Table 7. Large Scale Normality Test Results**

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Large Scale Pre-test	.184	13	.200	.896	13	.116
Large Scale Post-test	.222	13	.080	.901	13	.139

Based on the Table 7, the normality test using the Shapiro-Wilk test on the pretest values shows a significant result of 0.116, and on the posttest values, 0.139. The results of the normality test are considered normal if the significance value is greater than 0.05. The pretest result above is 0.116, and the posttest result is 0.139, indicating that both are normally distributed because the significance values are > 0.05. Next, a paired-samples t-test was conducted, and the results are shown in Table 8.

**Table 8. Large Scale Paired Sample T-Test Results**

Paired Differences			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
-47.692	12.352	3.426	-55.156	-40.228	-13.992	12	<.001

Based on the Table 8, Sig. (2-tailed) shows a value of < 0.001, so it can be concluded that there is a significant difference in the average scores between the pretest and posttest, indicating an effect. Next, the final test was conducted as a large-scale trial, namely the N-Gain test, with the results shown in Table 9.

**Table 9. Large Scale N-Gain Test Results**

	N	Minimum	Maximum	Mean	Std. Deviation
NGain	13	.40	1.00	.7577	.16630
Valid N (listwise)	13				

Based on the Table 9, the mean N-Gain value of 0.7577, which falls into the high category, indicates an improvement in learning outcomes after using the PETAMUSI media.

### 3.1.5. Evaluate

The feasibility of the PETAMUSI media is evident from the feedback of teachers and students. Teachers gave a score of 97.5%, and students in a small-scale trial gave 95%. This media is accepted by both teachers and students based on the appropriateness of the material and the quality of the media. The high score of 97.5% on the teacher response questionnaire indicates that the PETAMUSI media aligns with the intended learning objectives and outcomes. Additionally, the PETAMUSI media is presented in accordance with the characteristics of fifth-grade students, using appropriate material and engaging, communicative language to make it easier for students to understand. The selection of the PETAMUSI media's size, color, and design is considered appropriate. In the student response questionnaire, a score of 95% was shown, indicating student satisfaction because the PETAMUSI media is easy to use and engaging. The creativity and understanding evident from the PETAMUSI media can make students enjoy the learning process. The appropriate size of the media, non-monotonous colors, and easily understandable material supported by real images make it easy for students to comprehend. Students become more enthusiastic in the learning process because they feel like they are learning while playing with friends.

## 3.2. Discussion

### 3.2.1. Development of PETAMUSI Media in the Natural and Social Sciences Learning Subject

This media is used in natural and social sciences learning with active student participation through PETAMUSI media, namely flashcards and maps. This aims to introduce and explore the diversity of traditional

Indonesian music and its regional origins. At the initial stage, the teacher provides a brief explanation of Indonesia's cultural diversity, referring to traditional music. Students are first introduced to traditional Indonesian music and given several examples to build an initial understanding. Next, the students are divided into several small groups to play with the PETAMUSI media. The activities in implementing this media begin with each group taking a PETAMUSI flashcard, then guessing the origin province and moving toward the target province on the map. This activity can boost students' enthusiasm because it is interactive and offers an opportunity to learn while playing. According to Rabbani (2025), students are more enthusiastic about participating in learning, especially when the learning process incorporates games.

In addition to playing with flashcards and maps, the PETAMUSI media incorporates dance elements through simple movements related to traditional music, which students also perform. The application of PETAMUSI media not only focuses on cognitive aspects but also on training students' motor skills and creativity. This is in line with da Ary and Markamah (2024) Educational dance for elementary school students is not aimed at making students reliable, flexible dancers or at instilling aesthetic values, but rather at developing students' creativity, psychomotor skills, and basic development, as well as instilling cultural values from an early age. In this case, after learning the traditional music, the students will move in accordance with its tempo or rhythm. The movements used are the students' creative movements based on the sounds of traditional music they hear. Each movement, element, and unique gesture is explored by the body as an instrument of expression to the fullest (Setyawati et al., 2023). During the learning process, students become more active in group discussions, ask questions of their peers, and are more willing to present to the class. The implementation of the PETAMUSI media creates an enjoyable learning atmosphere, increases student participation, and makes natural and social sciences material easier to understand.

The PETAMUSI media offers several advantages for supporting natural and social sciences learning in fifth-grade elementary school. The visual elements in the flashcards and maps are made attractive with appropriate colors and placements, as well as direct interaction with students through interactive activities. With the PETAMUSI media, learning is not monotonous, thus improving students' learning outcomes. The integration of dance art elements through simple creative movements in this medium not only allows students to understand the subject theoretically but also to develop creativity and self-confidence and improve motor skills, thereby creating a meaningful learning experience. This is in line with Martini et al. (2025) that the integration of dance art is not merely entertainment, but also supports the cognitive, affective, social, and motor development of children.

### 3.2.2. Feasibility of PETAMUSI Media in Natural and Social Sciences Subject

The PETAMUSI learning media products, which consist of maps and flashcards being developed by researchers, can be used by students in the natural and social sciences subject "Traditional Music" for fifth grade. To assess the development of content quality and media compatibility, classroom implementation of the learning materials is necessary. The quality review and evaluation of the final product will be conducted by subject-matter and media experts afterward. The media development conducted by the researcher is expected to meet the curriculum standards applicable in schools. The improvements and feedback needed for the developing media require validation from experienced subject-matter and media experts. Based on the validity test results, 96% of media experts, 87.5% of dance material experts, and 89% of social studies material experts concluded that the assessment meets the requirements and falls within the fairly feasible criteria. This indicates that the PETAMUSI media meets the application standards in elementary schools. The development of media such as maps and flashcards can improve students' learning outcomes in the classroom by providing new learning experiences. This is in line with the opinion of Agustira and Rahmi (2022), who state that the presence of media can enhance students' learning outcomes, make the learning process more engaging, increase student motivation, and provide a comprehensive learning experience during teaching and learning.

In this study, the PETAMUSI learning media was developed with several innovations, namely, a combination of concrete media flashcards and a map of Indonesia. During use, students or players walk directly on the Indonesia map banner after obtaining the flashcards. This media contains material on "Indonesian Traditional Music" and a barcode containing sounds of Indonesian traditional music to hone students' creativity. Additionally, the PETAMUSI media is integrated with dance art, challenging students to move freely according to the sounds of the traditional music they receive. Learning with PETAMUSI is designed as learning through play, such as answering questions, guessing, and moving, guided by students' creativity, and it can accommodate different learning styles and support student-centered learning. In this case, students become the center of teaching, not the object of teaching, because they are actively involved in designing solutions and conveying ideas (Nafilata et al., 2025).

According to the validation results, the application of the PETAMUSI media in the natural and social sciences learning of the "Traditional Music" material for fifth grade indicates that this media is well-suited for use. Validation by media experts, dance art material experts, and social studies material experts has shown that

the PETAMUSI media is aligned with the learning content, well designed, and suitable for students' needs. The combination of maps and flashcards creates a more engaging, interactive presentation of the material. Teachers can use the PETAMUSI media to engage students in learning, supporting better, more appropriate learning outcomes. Thus, PETAMUSI media can be presented as a platform to support innovative natural and social sciences learning that aligns with the characteristics and learning styles of fifth-grade students.

### 3.2.3. Effectiveness of PETAMUSI Media in Natural and Social Sciences Subject

The results of the pretest and posttest prove an improvement in students' learning outcomes on the topic of "Traditional Music" using the PETAMUSI media, indicating the effectiveness of this media in the learning process. The average pretest score was 36.62, while the average posttest score increased to 84.74. With that data, the average increase in learning outcomes was 48.42. This more satisfactory result demonstrates that using the PETAMUSI media in teaching improved students' understanding of the material. The number of students who achieved learning completeness also increased compared to before the media was used. The positive impact on students' learning outcomes was demonstrated by the implementation of the PETAMUSI media after the teaching session.

The effectiveness of the PETAMUSI media is also confirmed by the results of statistical tests through the paired simple t-test and N-Gain test. According to the paired simple t-test analysis, the Sig. (2-tailed) in the media trials on both small and large scales shows a value of  $< 0.001$ , thus it can be concluded that there is a difference in the average values between the pretest and posttest on both small and large scales, indicating an effect. Furthermore, the results of the N-Gain test calculations on the small-scale media trial with a mean N-Gain value of 0.8258, categorized as high, and the large-scale media trial with a mean N-Gain value of 0.7577, also categorized as high, prove that there is an improvement in learning outcomes after using the PETAMUSI media. Therefore, the PETAMUSI media is considered effective for the natural and social sciences subject. This is in line with the opinion of Pallant et al. (2025), who state that the value is one of the indicators to determine the achievement of learning outcomes.

The effectiveness of the PETAMUSI media can be explained through the integration of learning experiences. The distribution of traditional music is easier to understand with maps; flashcards help provide subject-matter information as part of retrieval practice. Retrieval practice strengthens students' foundational knowledge and serves as a scaffold for more complex cognitive processes, thereby enhancing the effectiveness of learning without adding significant complexity (Gjerde et al., 2025). The characteristics of traditional music are learned aurally through audio barcodes, and kinesthetic activities involving imaginative movement are facilitated by integrating dance. In addition, PETAMUSI applies game-based learning, which utilizes games as educational tools to support learning and skill development (Wanglang et al., 2024). Collaboration among students through media in group-based games enhances participation and motivation to learn. Students appeared more focused, actively asked questions, and enjoyed collaborating with their groupmates during the implementation of the PETAMUSI media. This makes the media effective in improving student participation and learning outcomes.

### 3.3. Implications

From a pedagogical perspective, this research demonstrates that elementary school students require new learning media that are relevant to the material being studied. This is supported by Fathurohmah and Ary (2025), who state that media development makes an important contribution to learning because it can be tailored to students' needs and characteristics. The use of textbooks and mere listening to the teacher's explanations makes students less active, resulting in less optimal understanding of the material. With PETAMUSI media in learning, students can play a more active role because it is student-centered and fosters a more active learning approach. PETAMUSI media, integrated with dance art in this concrete medium, makes students more active in learning and improves their learning outcomes for the material being taught.

Practically, the PETAMUSI media can assist teachers in classroom learning. Media is one form of tool to help teachers in the teaching and learning process in the classroom (Mardatillah et al., 2023). With student-centered learning, teachers do not need to explain the material in a broad, in-depth manner; rather, they act as facilitators and provide brief, clear explanations. In this medium, students are required to understand the material in ways that align with their thinking. The integration of dance and concrete media that engages students' entire bodies fosters creativity and helps students understand the material. The motivation to learn and the active participation in following the lessons using this medium make the learning process appear more engaging and less monotonous.

Theoretically, this research is relevant to Vygotsky's social constructivism theory, which emphasizes direct learning experiences for students (Azis et al., 2025). Learning can integrate various approaches for students, such as visual, kinesthetic, and direct experiences. The implementation of learning based on the known learning style profiles of students is capable of motivating and maximizing learning outcomes because it aligns with the

preferences and abilities of each student (Fadhila et al., 2024). The integration of disciplines such as dance into the natural and social sciences curriculum, marked by students' creative movement, aligns with 21st-century learning, which encourages students to play an active role in the learning process. The development of learning media that involves students in the process and enhances learning outcomes demonstrates that this research contributes to education and can serve as a reference for future research in natural and social sciences and other subjects and disciplines.

### 3.4. Limitations

This research has several weaknesses that should be considered when implementing the PETAMUSI media. Coordinating students during activities, managing time, and thoroughly preparing are necessary before implementing this media. If the number of students is too large, the learning process may become less supportive. This media also requires a sufficiently large space for students to move freely. Teachers are expected to maintain effective classroom management to ensure the implementation of the PETAMUSI media proceeds in line with the learning objectives, thereby improving students' learning outcomes. In addition, the PETAMUSI media, specifically the flashcards, only focus on traditional music or traditional musical instruments. This means the media cannot be used for other subjects and can only be used for that particular subject. In its implementation, not all students enjoy movement in learning, so those students appear less active, and their learning styles are not utilized effectively. Therefore, further research is recommended to develop learning media in other subjects or disciplines that also integrate a wider variety of subjects and learning styles.

## 4. Conclusion

This study aims to develop the PETAMUSI (*Peta Musik Tradisi/ Traditional Music Map*) teaching aid, integrated with dance education, using natural and social sciences traditional music materials for fifth-grade students. The results show that the developed teaching aid is highly suitable for use, as evidenced by expert validation, and capable of improving student learning outcomes. Improved understanding of the material, active participation, and good learning outcomes among students indicate that the implementation of the PETAMUSI teaching aid has been successful. Therefore, the PETAMUSI teaching aid can be used as an innovative learning tool that supports student participation and accommodates diverse learning styles.

## Author Contributions

A. P. N.: writing original draft introduction methods, results, discussion, and conclusion. D. D. A reviewing.

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## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

## Data Availability

The datasets generated during and/ or analyzed during the current study are available from the corresponding author on reasonable request.

## Declaration on AI Use

AI were used only to improve readability and language under strict human oversight; no content, ideas, analyses, or conclusions were generated by AI.

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