

Descriptive Analysis of Music Arts Learning Efforts at State Senior High School 2 Langowan

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ARTICLE INFO	ABSTRACT
Received: September 3, 2026	This study aims to describe and analyze efforts to improve music arts learning at SMA Negeri 2 Langowan, focusing on students' learning interest, participation, musical skills, creativity, and learning outcomes. The study employed a quantitative approach with a correlational and regression design. The research was conducted from September to November 2023 and involved 30 Grade XII Social Sciences students selected through total sampling. Data were collected using questionnaires, observations, interviews, and documentation. The data were analyzed descriptively and inferentially through frequency and percentage analysis, Pearson product-moment correlation, and simple linear regression. The findings indicate that music arts learning initially faced several challenges, including teacher-centered instructional practices, limited musical instruments and facilities, low student motivation, and weak extracurricular support. To address these challenges, the school implemented four complementary strategies: Project-Based Learning (PjBL), digital technology and media utilization, teacher professional development, and strengthening of extracurricular music activities. The implementation of these strategies resulted in positive changes in the learning process and student outcomes. Student attendance increased to 95%, while average practical music scores increased from 70 to 85. Furthermore, 80% of students reported that music learning became more enjoyable, 75% demonstrated improved practical skills, and 90% became more confident in public performances. Participation in extracurricular music activities increased from 10 to 35 students. These findings demonstrate that an integrated approach combining pedagogical innovation, digital technology, teacher competence, and authentic musical experiences can create a more active, creative, collaborative, and meaningful learning environment. The study concludes that sustainable improvement in music arts education requires continuous teacher development, adequate facilities, effective technology integration, and opportunities for students to engage in authentic musical activities.
Accepted: October 27, 2026	
Published: November 2, 2026	
Keywords:	
Music arts education, Project-Based Learning, Learning interest, Musical skills, Extracurricular activities	

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1. Introduction

Education is one of the most important aspects of national development because it plays a fundamental role in developing human intellectual capacity, character, creativity, and social responsibility. Education is not merely a process of transferring knowledge but also a means of developing individuals so that they are able to think, act, create, and participate meaningfully in society. In Indonesia, the importance of education is constitutionally recognized through Article 31 of the 1945 Constitution, which guarantees citizens' right to education and mandates the government to organize a national education system. This mandate demonstrates that education is a fundamental right as well as a strategic instrument for improving the quality of human resources.

The importance of education is also emphasized in Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System. Education is defined as a conscious and planned effort to create a learning environment and learning process that enables students to actively develop their potential. Therefore, improving educational quality cannot be separated from efforts to improve the quality of teaching and learning processes. Sugandi (2004) argues that educational quality is closely related to the quality of learning processes, while Nuryani (2020) emphasizes the importance of teacher professionalism and student discipline in supporting effective learning. Education consequently requires the involvement of various stakeholders, including government, schools, teachers, parents, communities, and students themselves (Anni, 2004). Cooperation among these components is essential for creating learning environments that encourage students to develop their academic and non-academic potential.

The development of science, technology, and the arts has further transformed educational practices. Advances in technology and cultural development have influenced educational objectives, learning resources, teaching strategies, and students' learning experiences (Ochoa Tataje et al., 2024). Within this context, arts education occupies an important position because it provides students with opportunities to develop imagination, sensitivity, self-expression, creativity, and appreciation of cultural values. Podplota and Zhorniak (2022) explain that art contributes to the development of human potential by stimulating creative and expressive capacities. Thus, arts education should not be regarded merely as an additional subject but as an important component of holistic education.

Art is closely related to human life because it functions as a medium through which individuals communicate emotions, experiences, ideas, and perceptions. Everyday human activities are inseparable from artistic expressions, which can be found in music, dance, visual arts, theater, and other forms of cultural expression (Napadysta & Rykhliitska, 2022). Hasanah (2024) describes art as a process through which human emotions and self-expression can be represented. Since individuals possess different experiences and emotional characteristics, their ways of expressing themselves through art may also differ (Chaplin, 1997). Consequently, arts education provides a space in which students can explore their individual identities while simultaneously learning to appreciate different forms of expression.

Art education also has an important pedagogical function because artistic activities can encourage students to learn through experience, exploration, and play. Nurjanah and Hardiyanti (2020) emphasize that artistic activities can function as educational media through which children's creativity can be stimulated from an early age. In this regard, music represents one of the most accessible and dynamic forms of art in educational settings. Music involves listening, singing, playing instruments, creating, performing, and responding to sound. These activities require students to combine cognitive, affective, psychomotor, and social abilities. Jamalus (1988) therefore places music learning as an important process for developing students' musical abilities and appreciation.

Recent research further demonstrates that music education has a broader contribution to students' development. Lage-Gómez et al. (2024), through an integrative review of research

on musical creativity in secondary education, demonstrate that creativity in music learning encompasses several dimensions, including creative products, individuals or groups, creative processes, contexts, and musical domains. This finding indicates that music learning should not be restricted to students' ability to reproduce musical material but should also provide opportunities for creating, interpreting, collaborating, and expressing musical ideas. Similarly, Bolden and DeLuca (2022) found that assessment for learning can support students' musical creativity through the development of clear assessment criteria, encouragement of creative processes, optimization of classroom contexts, and student self-assessment.

The significance of arts-based learning is also demonstrated at the secondary-school level. Egana-delSol (2023) found that an arts-based program implemented in high schools had implications for students' academic achievement, creativity, and creative behaviors. This evidence strengthens the argument that arts education can contribute not only to artistic competence but also to broader educational outcomes. In addition, research by Nensin et al. (2023) concerning the implementation of the Merdeka Curriculum in music education demonstrates that effective music learning involves preparation, implementation, and evaluation, with active student participation and formative assessment playing important roles in monitoring learning effectiveness.

Nevertheless, the implementation of music education in schools may encounter various practical challenges. The effectiveness of music learning depends on the availability of musical instruments and other learning facilities, teacher competence, teaching methods, learning time, students' motivation, classroom conditions, and the ability of teachers to adapt learning activities to students' characteristics. Conventional learning practices that emphasize explanation and reproduction of musical material may provide limited opportunities for students to explore and develop creativity. In contrast, contemporary music education emphasizes active participation, experimentation, collaboration, performance, creation, and reflection. Therefore, teachers need to develop appropriate strategies that can connect musical concepts with students' practical experiences.

The context of SMA Negeri 2 Langowan is important in this regard. As a secondary educational institution, the school has an important role in providing students with opportunities to develop musical knowledge, skills, appreciation, creativity, and confidence. However, music arts learning may still face challenges related to facilities, learning approaches, student participation, and the implementation of practical musical activities. These conditions make it necessary to examine how teachers and schools attempt to overcome existing challenges and improve the quality of music arts learning. A descriptive investigation is particularly relevant because it can reveal the actual conditions of music learning, the strategies implemented by teachers, the involvement of students, the supporting factors, and the obstacles encountered during the learning process.

Accordingly, this study focuses on the efforts to improve music arts learning at State Senior High School 2 Langowan. The study seeks to describe the forms of effort undertaken in the planning, implementation, and evaluation of music learning, as well as the strategies used to encourage student participation and creativity. The study is expected to contribute both theoretically and practically to the development of music education. Theoretically, it may provide additional understanding of how music learning can be implemented in a secondary-school context. Practically, the findings are expected to provide teachers, schools, and other educational stakeholders with insights into strategies for improving music learning, overcoming limitations in the learning process, and creating learning environments that encourage students to actively develop their musical potential and creativity.

2. Method

2.1 Research Design

This study employed a quantitative research approach using a correlational and

regression design. Quantitative research is an approach that emphasizes the measurement of variables and the analysis of numerical data to examine relationships among variables and to test research hypotheses. According to Creswell and Creswell (2018), quantitative research is used to examine relationships between variables through the collection and analysis of numerical data. In this study, a correlational design was employed to determine whether there was a relationship between students' learning interest and their music arts learning outcomes. Correlation analysis is used to identify the presence, direction, and strength of a relationship between two or more variables (Arikunto, 2010).

In addition to correlation analysis, simple linear regression analysis was used to determine the extent to which students' learning interest could predict their music arts learning outcomes. Regression analysis provides an equation that can be used to estimate the value of a dependent variable based on the value of an independent variable (Ghozali, 2018). Thus, the independent variable in this study was students' learning interest (X), while the dependent variable was music arts learning outcomes (Y).

The research design can be formulated as follows:

$$X \rightarrow Y$$

where X represents students' learning interest and Y represents students' music arts learning outcomes.

2.2 Research Location and Time

The research was conducted at SMA Negeri 2 Langowan, involving students in Grade XII Social Sciences (IPS). The research was carried out from September to November 2023. The research location was selected because the school provided an appropriate context for examining students' learning interest and its relationship with learning outcomes in music arts.

2.3 Population and Sample

The population refers to the entire group of individuals or objects possessing particular characteristics that are relevant to a research study. According to Sugiyono (2017), a population is a generalization area consisting of objects or subjects with specific qualities and characteristics determined by the researcher for investigation and subsequent conclusion. In this study, the population consisted of all Grade XII Social Sciences (IPS) students at SMA Negeri 2 Langowan, totaling 30 students.

A sample is a part of the population that represents the characteristics of the population under investigation (Sugiyono, 2017). Because the population in this study consisted of only 30 students, the researcher employed a total sampling technique, in which all members of the population were included as research participants. Therefore, the sample consisted of 30 Grade XII Social Sciences students at SMA Negeri 2 Langowan.

2.4 Operational Definition of Variables

Operational definitions are used to clarify how research variables are conceptually defined and measured. According to Sugiyono (2014), an operational definition specifies the characteristics or constructs to be studied so that they can be translated into measurable variables. In this study, two variables were examined. The first variable was students' learning interest (X), defined as students' tendency to show attention, enthusiasm, involvement, and willingness to participate in the learning process, particularly in music arts learning. Learning interest was measured using a closed-ended questionnaire consisting of statements related to students' interest and involvement in learning. The second variable was music arts learning outcomes (Y), defined as the level of achievement demonstrated by students after participating in music arts learning activities. Learning outcomes were obtained from relevant learning achievement data documented by the school and/or teacher. The indicators of each

variable were translated into measurable items and used as the basis for constructing the research instrument.

2.5 Data Collection Techniques

Data collection techniques are important because the quality and accuracy of research findings depend partly on the appropriateness of the procedures used to obtain the data. In this study, data were collected through questionnaires, observation, and documentation.

a. Questionnaire

A questionnaire was used as the primary instrument to measure students' learning interest. A questionnaire is a data collection technique in which respondents are provided with a set of written statements or questions to answer (Sugiyono, 2017). In this study, a closed-ended questionnaire was employed, allowing respondents to select the response that best represented their learning condition. The questionnaire consisted of statements designed to identify the frequency and level of students' learning interest during the learning process.

The questionnaire employed a five-point Likert scale to measure the frequency of students' learning interest. Each response was assigned a numerical score, with Always receiving a score of 5, Often receiving a score of 4, Sometimes receiving a score of 3, Almost Never receiving a score of 2, and Never receiving a score of 1. The total score obtained from the questionnaire represented the level of learning interest of each student. A higher total score indicated a higher level of students' learning interest, whereas a lower score indicated a lower level of learning interest. The questionnaire scores were subsequently used as quantitative data to describe students' learning interest in the context of the learning process.

b. Observation

Observation was conducted to obtain supporting information concerning the learning process and students' participation in music arts learning activities. Observation involves systematically observing research objects or phenomena directly in their natural setting. According to Sugiyono (2017), observation enables researchers to obtain data through direct observation of the research object.

In this study, observation was conducted at the school during the learning process. The observation focused on students' participation, attention, enthusiasm, and involvement in music arts learning activities. The observation results were used as complementary data to support the questionnaire findings.

c. Documentation

Documentation was used to obtain supporting data relevant to the research variables. Documentation involves collecting and analyzing existing written, visual, or electronic records related to the research subject. Documents may include school records, student lists, learning achievement records, photographs, and other relevant materials. In this study, documentation was used to obtain information concerning the research population, students' music arts learning outcomes, school conditions, and other supporting information relevant to the research objectives.

2.6 Data Analysis Technique

The collected data were analyzed quantitatively using descriptive and inferential statistical techniques. Descriptive analysis was first conducted to describe the distribution of students' learning interest and music arts learning outcomes through measures such as frequency, percentage, mean, and standard deviation. Inferential analysis was subsequently conducted using Pearson product-moment correlation analysis to determine the relationship

between learning interest (X) and music arts learning outcomes (Y). The strength and direction of the relationship were determined based on the correlation coefficient. Furthermore, simple linear regression analysis was employed to examine whether learning interest could significantly predict music arts learning outcomes. The regression equation was formulated as:

$$Y = a + bX$$

where Y represents music arts learning outcomes, X represents learning interest, a represents the constant, and b represents the regression coefficient. The statistical significance of the relationship and regression model was assessed using an appropriate significance level ($\alpha = 0.05$). Statistical analysis was conducted using statistical software to ensure accuracy in data processing and interpretation.

3. Results and Discussion

This study was conducted at SMA Negeri 2 Langowan with the aim of identifying and analyzing various efforts to improve music arts learning. Data were obtained through direct classroom observations, interviews with the arts and culture teacher and several students, as well as documentation of classroom learning activities and extracurricular music activities. Based on the data collected, several main findings were identified as follows.

4.1 Initial Conditions of Music Arts Learning

Before the improvement efforts were implemented, music arts learning at SMA Negeri 2 Langowan was still conducted using conventional approaches. The teacher tended to use lectures and written assignments to deliver music theory without sufficient practical activities. As a result, the learning process was perceived as monotonous and less engaging for students. Most students attended music lessons merely to fulfill academic requirements rather than because of an intrinsic interest in music.

Learning facilities and infrastructure also constituted a major obstacle. The number of musical instruments available was very limited, including guitars, a keyboard, and percussion instruments, meaning that not all students could practice directly. The music practice room, which should have served as a space for creative exploration, was also not adequately organized. These conditions contributed to low learning motivation, participation, and practical skills in playing musical instruments and singing.

Before the implementation of the improvement efforts, music arts learning at SMA Negeri 2 Langowan faced various challenges related to facilities, teaching methods, and students' learning motivation.

a. Conventional learning methods

The teacher used lectures, assignments, and simple question-and-answer activities to deliver music theory. Consequently, the learning process tended to be teacher-centered and provided limited opportunities for students to participate actively. Students more frequently took notes on music notation theory or music history without engaging in practical music-making activities.

b. Limited learning facilities and infrastructure

The school had only a limited number of musical instruments, including one keyboard, two acoustic guitars, and several simple percussion instruments. This limitation prevented students from practicing equally. In addition, the arts and culture classroom did not have adequate acoustic facilities or sound equipment to support music learning activities.

c. Low student interest and motivation

Based on interviews with students, most stated that music arts was considered a supplementary subject rather than an important subject. Many students felt bored because the learning process was overly theoretical and insufficiently enjoyable. This

situation affected students' attendance and participation, which remained relatively low.

d. Limited support for extracurricular activities

Before the improvement efforts were implemented, music-related activities outside regular class hours were not well organized. There was no formal platform for students to develop and express their musical interests and talents. These conditions indicate that music arts learning needed to shift from a conventional approach toward a more creative, active, and experience-based learning model.

4.2 Improvement Efforts Implemented

To address these challenges, the school and the arts and culture teacher implemented several planned improvement strategies. These efforts included the following.

a. Implementation of Project-Based Learning

In this approach, students were divided into small groups and assigned music projects, such as composing songs, creating simple arrangements, or performing music in front of the class. These projects required students to collaborate, be creative, and take responsibility for their work. The teacher served as a facilitator who guided students throughout the process, from planning to evaluation.

b. Utilization of Digital Technology in Learning

The teacher introduced several music applications, including BandLab, MuseScore, and Soundtrap, to support learning activities. Through these applications, students could study music theory, create digital arrangements, and independently edit their musical works. The use of video materials from YouTube also helped students understand various musical styles and instrumental performance techniques.

c. Improvement of Arts and Culture Teacher Competence

The arts and culture teacher participated in several training activities and workshops focusing on the development of active and creative learning. The training covered the use of digital media, project-based teaching strategies, and learning approaches oriented toward students' interests and talents.

d. Strengthening of Extracurricular Music Activities

The school provided opportunities for students interested in music through extracurricular activities such as a school band, choir, and inter-class music competitions. These activities served not only as a means of developing students' talents but also as a form of appreciation for their learning achievements in the classroom.

4.3 Results of the Implementation of Improvement Efforts

After several months of implementing these strategies, significant improvements were observed in various aspects of music arts learning.

a. Increased student interest and motivation

Students became more enthusiastic about participating in classroom activities, more confident in performing in front of others, and more motivated to create musical works.

b. More interactive and creative learning processes

Students actively participated in discussions, exchanged ideas, and worked collaboratively in groups to produce engaging musical works.

c. Improved student learning outcomes

Students' music performance scores increased, and several students began participating in music competitions at the school and regency levels.

d. A more dynamic and inspiring learning environment

The music arts classroom became filled with enjoyable and productive activities,

providing students with more meaningful learning experiences. As a follow-up to the initial findings, the arts and culture teacher, together with the school, implemented a series of improvement efforts covering four main aspects: teaching methods, learning media, teacher competence, and supporting activities.

4.4 Implementation of Project-Based Learning

Through this method, the teacher guided students in developing music projects involving a creative process from planning to the performance of the final product.

Students were divided into several small groups, with each group working on a different project theme, such as:

1. Composing a song about the school environment.
2. Creating a rearrangement of a Minahasa regional song.
3. Performing a simple ensemble at a school event.

Through this approach, students learned to manage their time, divide responsibilities, practice together, and solve problems collaboratively. The learning process became more meaningful because students were directly involved in producing musical works rather than merely receiving theoretical knowledge.

a. Utilization of Technology and Digital Media

The teacher began introducing digital technology as an integral part of the learning process. Several applications were used, including:

1. BandLab and Soundtrap for recording and basic music mixing.
2. MuseScore for learning digital music notation.
3. YouTube as a reference source for various types of music and instrumental performance techniques.

With the assistance of technology, students who did not previously have musical instruments at home were still able to practice and create digital musical works. Technology also broadened students' knowledge of various musical genres from around the world, allowing them to explore music beyond popular songs.

b. Improvement of Teacher Competence

The arts and culture teacher participated in several training programs and workshops organized by the Minahasa Regency Education Office and arts teacher communities. Through these activities, the teacher learned about:

1. Project-based and collaborative learning strategies.
2. Techniques for teaching music using digital media.
3. Development of learning modules based on students' interests.

Following the training, the teacher became more capable of adapting teaching methods to students' characteristics and developing more interactive lesson plans.

c. Strengthening of Extracurricular Music Activities

The school subsequently established several music activity units, including a school band, choir, and Minahasa traditional ensemble. In addition, inter-class music competitions were held at the end of each semester to foster a spirit of competition and appreciation. These activities received strong support from students and other teachers because they provided students with meaningful opportunities for self-expression.

4.5 Results and Impacts of the Implementation

After one semester of implementing the improvement efforts described above, several significant positive changes were observed in both the learning process and students' learning outcomes.

a. Increased Learning Interest and Motivation

Observation results showed that student attendance in music arts classes increased to 95%. Students appeared more enthusiastic about participating in practical activities and demonstrated greater interest in various musical instruments.

During interviews, students stated that learning had become more enjoyable because they were able to engage directly in creative activities and perform in front of their classmates.

b. Changes in Student Attitudes and Participation

Previously, students tended to be passive and reluctant to participate in discussions or practical activities. After the implementation of the project-based approach, however, students became more confident, actively contributed ideas, and were more willing to present their work in front of the class. Some students even began composing their own songs and uploading them to the school's social media platforms.

c. Improvement in Musical Skills

Students' average music practice scores increased from 70 to 85 after the implementation of the new approach. Students were able to play simple musical instruments in groups and demonstrated a better understanding of basic harmony, rhythm, and music notation. In addition, several student groups successfully performed highly creative arrangements of regional music, which were subsequently presented at arts activities at the regency level.

d. A More Positive Learning Environment

Music arts became one of the subjects most anticipated by students. A collaborative and enjoyable learning environment created positive interactions between teachers and students. The teacher was no longer the center of the learning process but instead served as a facilitator and motivator.

e. Impact on the School Environment

The improvement efforts also had a broader impact on the overall school climate. SMA Negeri 2 Langowan began to be recognized for its active music activities and frequently featured student performances during school commemorative events. Music became a means of fostering togetherness among members of the school community while strengthening students' creative identities and character.

4.6 Supporting Quantitative Data: Descriptive Overview

Based on observations and assessment records, the following findings were obtained:

- a. 80% of students stated that music learning had become more enjoyable.
- b. 75% of students demonstrated improved practical music skills.
- c. 90% of students became more confident performing in public.

The arts and culture teacher reported that student engagement in the learning process increased by approximately twofold compared with the previous semester. Participation in extracurricular music activities increased from **10 students to 35 students**. These findings indicate that the improvement efforts were not only effective in enhancing the cognitive aspect of learning, particularly students' musical knowledge, but also the affective aspects, including motivation and attitudes, and the psychomotor aspects, particularly musical skills.

4.7 Changes in Students' Attitudes and Motivation

The implementation of the improvement strategies also resulted in observable changes in students' attitudes and motivation.

- a. Student attendance increased to **95%**.
- b. Students became more active in asking questions, contributing creative ideas, and performing in front of their peers.
- c. During interviews, many students stated that music learning had become more

interesting and enjoyable.

- d. Female students tended to participate more actively in the choir, whereas male students showed greater interest in the school band and digital music arrangement activities.

4. Discussion

The findings of this study indicate that various improvement efforts had a positive impact on the quality of music arts learning at SMA Negeri 2 Langowan. Each strategy implemented had a theoretical foundation and produced complementary practical effects. The findings suggest that improvements in music learning cannot be attributed to a single intervention but rather to the integration of innovative teaching methods, digital technology, teacher professional development, extracurricular activities, and a supportive learning environment.

5.1 Effectiveness of Project-Based Learning

The implementation of Project-Based Learning (PjBL) was found to be effective in increasing students' creativity, independence, collaboration, and active participation. By involving students in authentic music projects, the learning process moved beyond the passive transmission of information and encouraged students to construct knowledge through direct experience. This finding is consistent with the constructivist perspective of Vygotsky (1978), which emphasizes that meaningful learning develops through social interaction and contextual activities.

The findings are also supported by recent research on project-based learning. Ferrero et al. (2021), through a systematic review, examined empirical evidence concerning PjBL and found that the approach has potential to support student learning when its core elements and implementation conditions are appropriately designed. In music education specifically, Wulandari et al. (2021) reported that project-based learning can encourage students' creative thinking in learning to play musical instruments. Similarly, Susetyo and Nugroho (2023) demonstrated that project-based learning can facilitate the development of creativity in music learning.

In the present study, students were involved in composing songs, arranging regional music, and performing musical works in classroom and extracurricular settings. Through these activities, students were not only required to understand musical concepts but also to apply them in authentic situations. The process required students to plan activities, divide responsibilities, practice collaboratively, solve problems, and evaluate their final products. Such activities potentially explain the observed increase in students' participation and practical musical competence.

Project-based learning also contributed to the development of communication and interpersonal skills because students had to negotiate ideas, distribute responsibilities, and make collective decisions. This finding reinforces the social dimension of learning proposed by Vygotsky (1978), in which interaction with peers and more knowledgeable others contributes to cognitive development and creativity. Therefore, music learning that emphasizes authentic practice and collaborative production appears more capable of fostering engagement than instruction dominated by lectures and written assignments.

However, the effectiveness of PjBL should not be interpreted as automatic. Ferrero et al. (2021) emphasized that the effectiveness of PjBL can vary depending on implementation quality, instructional design, teacher support, and the extent to which the essential characteristics of project-based learning are maintained. Thus, the positive outcomes observed at SMA Negeri 2 Langowan may be associated not merely with the adoption of the PjBL label but with the teacher's active role in designing meaningful projects and facilitating students throughout the process.

5.2 The Utilization of Digital Technology and Media in Music Learning

The findings also demonstrate that digital technology played an important role in increasing students' musical engagement and learning opportunities. The use of applications such as BandLab, MuseScore, and Soundtrap enabled students to compose, arrange, record, edit, and evaluate musical works. Digital technology therefore functioned not merely as an instructional aid but also as a medium for musical exploration, creativity, collaboration, and self-expression.

This finding is consistent with Liu and Hwang's (2023) systematic review of mobile technology-supported music education. Their review identified learning motivation, learner perceptions, project-based learning, inquiry-based learning, and the development of digital music resources as important themes in technology-supported music education. More recent evidence from Mohammadian et al. (2026) similarly indicates that technology-enhanced music learning has expanded substantially and is associated with learning approaches, musical performance, and other learning outcomes. Their systematic review also shows that constructivist approaches remain dominant in technology-enhanced music learning.

The use of digital applications in this study also helped reduce the limitations created by the lack of physical musical instruments. Students who did not have access to instruments at home could still experiment with digital music production. This suggests that technology can expand opportunities for participation, particularly in contexts where physical resources are limited.

Digital technology also broadened students' musical horizons. Through YouTube and other online resources, students could explore different musical genres, performance techniques, arrangements, and international musical practices. This finding is important because contemporary music learning increasingly takes place across formal and informal learning environments. Digital platforms enable students to move beyond the boundaries of the classroom and engage with diverse musical resources according to their interests.

Recent research further confirms the growing importance of digital technologies in music education. Hernández-Marín et al. (2025), in a scoping review of digital technologies in compulsory music education between 2020 and 2024, identified extensive use of digital tools across educational levels and documented a wide variety of pedagogical applications. Likewise, Ho Weatherly et al. (2024) reviewed digital game-based learning in music education and demonstrated the growing integration of digital technologies into both formal and informal music-learning environments.

Nevertheless, technology should not be viewed as a substitute for pedagogy. Mohammadian et al. (2026) emphasize that pedagogical challenges may be at least as important as technological barriers in technology-enhanced music learning. Thus, the effectiveness of BandLab, MuseScore, Soundtrap, YouTube, or similar platforms depends on how teachers integrate them into meaningful learning activities.

5.3 Improvement of Teacher Competence and Its Impact on Learning

The findings demonstrate that teacher competence is an important factor in determining the success of music-learning innovation. The arts and culture teacher's participation in training and workshops enabled the teacher to develop more varied, interactive, and adaptive learning strategies.

This finding is consistent with Shulman's (1986) concept of pedagogical content knowledge (PCK), which emphasizes the importance of teachers' ability to transform subject knowledge into forms that are accessible and meaningful to learners. In the context of music education, teachers need not only musical knowledge but also pedagogical competence and the ability to select appropriate technologies and learning strategies.

Recent research provides additional support for this finding. Partti et al. (2021/2023) found that professional development in music education technology can support teachers'

skills and knowledge in technology-supported composition and creative music-making. Their study also emphasizes that professional development should extend beyond technical skills and include critical reflection and the development of teachers' capacity to learn within digital environments.

Similarly, Calderón-Garrido et al. (2020) examined digital technologies in music education within primary teacher training and highlighted the importance of teachers' habits, profiles, and technological competencies in determining how digital technologies are integrated into music teaching. These findings suggest that the availability of technology alone is insufficient. Teachers must possess the competence and confidence to transform technology into meaningful pedagogical experiences.

In the present study, the teacher's improved competence was reflected in the ability to design music projects, integrate digital media, facilitate collaborative learning, and adapt instructional strategies to students' interests. The teacher consequently shifted from being the central source of information to becoming a facilitator, mentor, and motivator. This transformation was important in creating a more student-centered learning environment.

5.4 Strengthening Extracurricular Music Activities

Extracurricular music activities at SMA Negeri 2 Langowan also played an important role in strengthening students' interest and motivation. The school band, choir, traditional Minahasa ensemble, and inter-class music competitions provided opportunities for students to apply classroom knowledge in authentic performance contexts.

These activities are particularly important because musical competence develops through sustained practice, performance, feedback, and social interaction. Students who participated in extracurricular activities were able to practice musical skills more intensively while developing discipline, responsibility, cooperation, and confidence.

The findings can also be interpreted through Gardner's (1983) theory of Multiple Intelligences, particularly musical intelligence. Providing students with opportunities to express musical abilities through authentic activities allows schools to recognize forms of competence that may not always be visible through conventional academic tasks.

The strengthening of extracurricular activities also contributed to the development of a positive school culture. Students were provided with opportunities to perform their work in front of peers and the wider school community. Such opportunities can strengthen students' sense of belonging and recognition while creating social connections through shared musical experiences.

The social and emotional dimension of music education is supported by Váradi (2022), whose review of the literature indicates that music education can contribute to social-emotional learning, including emotional awareness, interpersonal relationships, empathy, and responsible social behavior. Zhang and Abu Talib (2023) similarly found evidence that music education approaches can support social-emotional competence through cooperation and adaptive interaction.

5.5 Impact on Motivation, Creativity, and Student Achievement

One of the most important findings was the improvement in students' motivation, creativity, and musical achievement. The data indicated that student motivation increased from 30% to 80%, average music practice scores increased from 70 to 85, and extracurricular participation increased almost threefold. These changes suggest that the combination of PjBL, digital technology, teacher professional development, and extracurricular activities contributed to the creation of a more supportive learning environment.

These findings can be interpreted through Self-Determination Theory (SDT) developed by Deci and Ryan (1985). SDT proposes that intrinsic motivation is strengthened when individuals experience autonomy, competence, and relatedness. The learning strategies

implemented in this study addressed all three psychological needs. Students were given opportunities to make decisions and create musical products, thereby supporting autonomy; they practiced and developed musical skills, thereby supporting competence; and they collaborated with peers, thereby supporting relatedness.

Recent research provides strong support for this interpretation. Ryan and Deci (2020) explain that autonomous motivation is facilitated when learning environments support students' basic psychological needs. Howard et al. (2021), through a meta-analysis involving 344 samples and more than 223,000 participants, found that intrinsic motivation is associated with positive academic and well-being outcomes, while more autonomous forms of motivation are associated with persistence and student adjustment.

This perspective is particularly relevant to music education because motivation is closely related to sustained practice and participation. Oliveira-Silva et al. (2021), in a systematic review of motivation in instrumental music learning, found that motivation is a central issue in music education and is influenced by social and contextual factors. More recent research on classroom music motivation likewise emphasizes the importance of teachers' instructional strategies and motivational climate in encouraging students' engagement.

The increase in practical music scores from 70 to 85 can therefore be interpreted not simply as an improvement in technical ability but also as an indication of increased opportunities for meaningful practice. Students who are more motivated and actively involved are more likely to invest effort in practice, collaboration, and creative production.

5.6 The Role of Music Arts Learning in Character Development

Music arts learning also contributed to students' character development. Musical activities required students to demonstrate discipline through regular practice, responsibility through completion of group projects, confidence through public performance, and tolerance through collaboration with peers.

These findings are consistent with Lickona's (1991) perspective on character education, which emphasizes the development of moral values through educational experiences that involve knowledge, feeling, and action. Music education provides a particularly valuable context because students must coordinate individual goals with collective performance.

The social-emotional benefits identified in this study are supported by recent literature. Váradi (2022) argues that music education can contribute to social-emotional development by creating opportunities for students to recognize emotions, develop empathy, establish relationships, and participate responsibly in social environments. This is particularly evident in ensemble activities, where individual musical performance must be synchronized with the collective performance of the group.

Thus, music education at SMA Negeri 2 Langowan should not be viewed solely as an activity aimed at improving musical knowledge and performance. It also functions as a medium for developing interpersonal skills, emotional expression, cooperation, discipline, and self-confidence.

5.7 Integration of the Improvement Strategies

Taken together, the findings indicate that the most important contribution of the improvement program was the integration of several complementary strategies. PjBL provided an authentic structure for students to create and perform music; digital technology expanded access to musical resources and creative tools; teacher professional development strengthened pedagogical capacity; and extracurricular activities provided additional opportunities for practice and performance.

This integrated approach is consistent with contemporary developments in music education, which increasingly emphasize learner-centered, technology-supported, collaborative, and creative learning environments. Recent systematic reviews indicate that

technology-supported music education frequently combines digital tools with active learning approaches, including project-based and inquiry-based learning. Meanwhile, research on teacher professional development demonstrates that teachers' digital competence remains an important condition for translating technological possibilities into meaningful classroom practice.

The findings therefore suggest that improving music arts education requires more than providing additional instruments or introducing digital applications. Sustainable improvement depends on the interaction between pedagogical innovation, teacher competence, technological resources, student motivation, and opportunities for authentic musical participation.

Overall, the experience at SMA Negeri 2 Langowan demonstrates that music learning can become more engaging, participatory, and meaningful when students are positioned as active creators rather than passive recipients of musical knowledge. The improvement in attendance, motivation, participation, practical performance, and extracurricular involvement provides evidence that a multidimensional improvement strategy can contribute to the development of students' cognitive, affective, social, and psychomotor competencies.

5. Conclusion

This study concludes that music arts learning at SMA Negeri 2 Langowan initially faced several challenges, particularly the dominance of conventional and teacher-centered learning methods, limited musical instruments and learning facilities, low student interest and motivation, and limited extracurricular music activities. These conditions resulted in relatively passive student participation and restricted opportunities for students to develop their musical skills, creativity, and confidence.

The improvement efforts implemented by the school and the arts and culture teacher involved four complementary strategies: the implementation of Project-Based Learning (PjBL), the utilization of digital technology and media, the improvement of teacher competence, and the strengthening of extracurricular music activities. PjBL provided students with opportunities to compose songs, arrange regional music, perform musical works, collaborate in groups, and take responsibility for their learning products. Digital applications such as BandLab, MuseScore, and Soundtrap expanded students' opportunities to create, arrange, record, and explore music despite limitations in physical instruments. Teacher training strengthened the teacher's capacity to implement student-centered and technology-supported learning, while extracurricular activities such as school bands, choirs, traditional Minahasa ensembles, and music competitions provided additional opportunities for practice and performance.

The implementation of these strategies was followed by positive changes in students' participation, motivation, musical skills, and learning environment. Student attendance increased to 95%, average practical music scores increased from 70 to 85, 80% of students reported that music learning had become more enjoyable, 75% demonstrated improved practical skills, and 90% became more confident in performing publicly. Participation in extracurricular music activities also increased from 10 to 35 students. Students became more active in discussions, more willing to express creative ideas, more confident in performing, and more capable of collaborating in producing musical works.

Overall, the findings demonstrate that improving music arts learning requires a multidimensional and integrated approach rather than reliance on a single teaching strategy. The combination of pedagogical innovation, digital technology, teacher professional development, and extracurricular activities created a more active, creative, collaborative, and meaningful learning environment. Therefore, music arts education at SMA Negeri 2 Langowan has the potential not only to improve students' musical knowledge and psychomotor skills but also to foster motivation, creativity, confidence, cooperation,

discipline, and social-emotional development. Sustainable improvement should consequently be supported through continuous teacher development, adequate learning facilities, appropriate use of technology, and consistent opportunities for students to engage in authentic musical experiences.

Acknowledgments

The authors would like to express their gratitude to State Senior High School 2 Langowan for providing support and access during the research process. The authors also extend their appreciation to the supervisors and the Program Studi Pendidikan Seni Drama, Tari, dan Musik, Fakultas Bahasa dan Seni, Universitas Negeri Manado for their academic guidance and support.

Funding

No external funding was received for this research.

Conflict of Interest

The authors declare that there is no conflict of interest related to this research or its publication.

Authors' Contribution

Franklin Dumais: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, and Project Administration.

Meyny S. C. Kaunang: Supervision, Methodology, Validation, Writing – Review & Editing, and Project Administration.

Marselino S. Malonda: Investigation, Data Curation, Validation, and Writing – Review & Editing.

All authors have read and approved the final version of the manuscript.

Statement of the Use of AI

Artificial intelligence (AI) was not used for data analysis or interpretation. AI tools were used to assist with translation during the preparation of the manuscript. The authors remain fully responsible for the accuracy, interpretation, and final content of the manuscript.

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