

# The Effectiveness of the Angklung Bina Nusantara Application in Improving the Musicality of Students of the Madrasah Ibtidaiyah Teacher Education Study Program

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## ABSTRACT

Students of the Madrasah Ibtidaiyah Teacher Education Study Program often have diverse musical backgrounds, and many of them have limited experience in playing musical instruments. The limited availability of traditional musical instruments, such as the angklung, increases the barriers to students' independent practice. This study aims to analyze the effectiveness of the Bina Nusantara Angklung implementation in improving the musical abilities of students in the Elementary Madrasah Teacher Education Study Program. The research approach used is quantitative research with a pre-experimental design, conducting a pretest-posttest. The participants were of students of the Madrasah Ibtidaiyah Teacher Education Study Program who took the Cultural Arts course in the odd semester of the 2025/2026 academic year. Data were collected through performance observation sheets based on three musicality indicators: pitch accuracy, rhythmic accuracy, and group harmonization. The data were analyzed using descriptive statistics and a paired sample t-test. The findings show that the use of the Angklung Bina Nusantara application improved students' musicality skills. Before the course, 63% of students had low musical ability. After the course using the app, 83% of students had good or excellent musical ability. Furthermore, the app encouraged independent practice, increased self-confidence, and supported collaborative learning. These findings suggest that the Angklung Bina Nusantara app can be used as an effective digital learning tool to improve students' musical abilities while supporting the preservation of traditional music in higher education.

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## 1. INTRODUCTION

Music arts education plays a strategic role in shaping the pedagogic competence, creativity, and musicality of students of the Madrasah Ibtidaiyah Teacher Education Study Program (Awliyah & Wulan Anna Pertiwi, 2024). Students' musicality abilities include tonal accuracy, rhythmic accuracy, and harmony, which are key indicators of the success of music learning in college (Widoyoko, 2012). However, most Madrasah Ibtidaiyah Teacher Education Study Program students begin their studies without formal experience in playing music, resulting in a competency gap that has the potential to hinder the achievement of music learning standards (Simamora, 2025).

In addition to the factor of students' initial ability, the limitation of facilities and infrastructure is a significant obstacle (Munthe, 2025). Traditional instruments such as angklung require an adequate number of tools for collective practice. However, procurement costs and the risk of instrument damage limit students from playing together. This condition makes it difficult for students to improve their ability to play angklung music. Even though the intensity of the practice has a great effect on the student's ability to play music, which in this case is angklung music. As a result, lecturers face challenges in achieving students' practical competencies according to curriculum standards (Ozmentes, 2012).

The development of information technology is driving the use of mobile-based learning (m-learning). This technology can expand access to learning, increase flexibility, and maintain the quality of learning materials, while encouraging creativity and active student participation (Kusuma & Muharom, 2025). The application of digital technology-based media in learning can promote adaptive, efficient, and relevant learning styles for the digital generation.

The Angklung Bina Nusantara application is a relevant innovation in this context. The app not only provides precise simulation of tone and rhythm, but also integrates a multisensory learning approach, which engages the visual, auditory, and kinesthetic senses simultaneously. In this way, students can build a gradual understanding of musicality through fun and contextual digital interactions. In addition, this application also supports students to study independently.

This research also encourages the preservation of local wisdom in education, particularly the art of angklung, among students of the Elementary School Teacher Education Study Program. Angklung, as a traditional musical instrument, holds philosophical and pedagogical value. The use of digital angklung applications can help maintain the relevance of traditional musical instruments in the digital era and prepare students of the Elementary School Teacher Education Study Program to teach music creatively, interactively, and adaptively in elementary schools without abandoning local wisdom.

With this background, this study aims to examine the effectiveness of the use of the Angklung Bina Nusantara application in improving the musicality of Madrasah Ibtidaiyah Teacher Education Study Program students, especially in the aspects of pitch accuracy, rhythm accuracy, and group harmonization.

## 2. METHODS

This study uses a quantitative approach with a pre-experimental one-group pretest-posttest design (Scott, 2010), which aims to evaluate the effectiveness of the Angklung Bina Nusantara application in improving the musicality of students of the Madrasah Ibtidaiyah Teacher Education Study Program before and after the intervention. The research population is all of students of the Madrasah Ibtidaiyah Teacher Education Study Program who take Cultural Arts courses in the odd semester of the 2025/2026 academic year. Samples were selected using purposive sampling.

The research instrument consisted of a performance observation sheet using an assessment rubric that assessed three main indicators: pitch accuracy, rhythmic precision, and group harmonization. The assessment was carried out on a likert scale of 1–5, where a score of 1 indicates very low ability and a score of 5 indicates a very high ability. The validity of the rubric is guaranteed through expert tests, while reliability is measured through the consistency of the assessment between observers.

The research procedure is carried out through three stages. The first stage is the pretest, where the student's initial musicality ability is measured using physical instruments. The second stage is

intervention, where students practice using the Angklung Bina Nusantara application, including independent exercises, simulation of tone and rhythm, as well as group practice based on multisensory features. The third stage is the posttest, where students are re-tested on the same musical composition, so that changes in musicality can be measured objectively.

The data obtained were analyzed using descriptive statistics to compare mean scores, standard deviations, and distribution of musicality ability before and after the intervention. In addition, the paired sample t-test was used to test the significance of improving students' musical abilities using the SPSS application.

### 3. FINDINGS AND DISCUSSION

Based on the results of the research, it can be seen that the use of the Angklung Bina Nusantara Application is effective in improving the musicality skills of Madrasah Ibtidaiyah Teacher Education Study Program students. Prior to the intervention, most students (63%) had low musicality ability, especially in terms of pitch accuracy, rhythm, and group cohesiveness. After the lecture using the Angklung Bina Nusantara Application, most students (83%) obtained a score in the category of Good to Very Good (4.00–5.00). This shows a significant improvement in musical playing skills. Students become more confident, actively practice independently, and are able to adjust collective games with their group mates, so that harmony is achieved in angklung games.

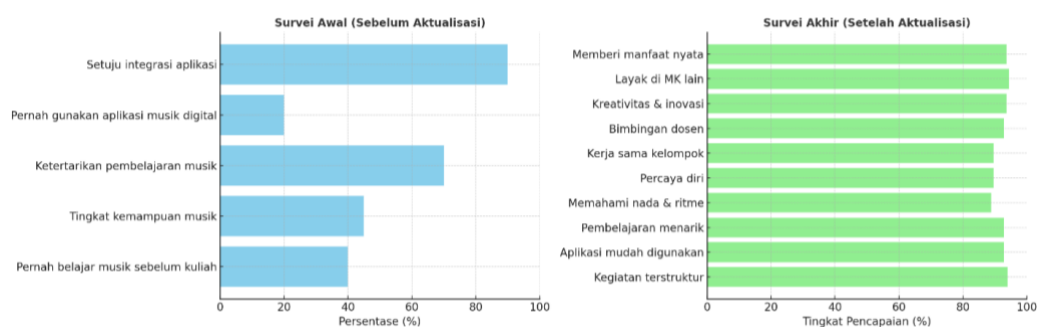


Figure 1. Comparison of Initial and End Lecture Surveys Using the Angklung Bina Nusantara Application

This application-based learning actualization also presents innovation by integrating the values of local wisdom and modern digital technology. The Angklung Bina Nusantara application allows students to practice flexibly, anytime and anywhere, without depending on the availability of physical instruments. Students show enthusiasm because they feel helped and find the learning process more fun and easy to understand. The classroom atmosphere becomes more lively, collaborative, and brings out the spirit of togetherness, thus creating a participatory learning environment and supporting learning motivation.



Figure 2. The Lecture Process Using the Angklung Bina Nusantara Application

In addition to increasing musicality, this activity also improves students' digital literacy and lecturers' pedagogic abilities. Students learn to operate digital music applications independently, while lecturers can develop more creative and adaptive teaching methods. The learning process becomes more efficient and measurable, with the assessment of students' musical abilities documented through video recordings and digital evaluation sheets. These results indicate that the use of the app not only enhances students' musical abilities but also fosters professionalism, responsibility and adaptability in 21st-century learning practices.

Challenges encountered during the learning process, such as differences in students' device specifications, unstable internet connections or limited practice time, can be overcome by using backup devices or utilising the app in offline mode. With this approach, the learning process continues to run smoothly, and all students can follow music practice optimally. Overall, the integration of the Angklung Bina Nusantara application has proven to be an effective, efficient, and innovative learning medium in increasing the musicality of students of the Madrasah Ibtidaiyah Teacher Education Study Program and supporting the modernization of digital technology-based art education.

### **Discussion**

Authors should discuss the results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted. The following components should be covered in the discussion: How do your results relate to the original question or objectives outlined in the Introduction section (what/how)? Do you provide interpretation scientifically for each of your results or findings presented (why)? Are your results consistent with what other investigators have reported (what else)? Or are there any differences?

The research findings indicate that the use of the Angklung Bina Nusantara app can significantly improve the musical abilities of students on the Primary Madrasah Teacher Education programme, particularly in terms of pitch accuracy, rhythmic accuracy and group harmonisation. This improvement is consistent with digital pedagogy theory, which emphasises that the use of technology can support a more effective, critical and adaptive learning process (Safitri et al., 2025). Students can practice independently through the app, without depending on the availability of physical instruments, so the frequency and intensity of practice increases, which directly impacts their musical skills (Santi Parlina, 2026).

In addition, increased musicality can also be explained through multisensory learning theory, which emphasizes the simultaneous involvement of the visual, auditory, and kinesthetic senses in the learning process (Aziz et al., 2025). The digital angklung application provides note visualization, audio simulation, and kinesthetic practice through physical or virtual instruments, so that students are able to process music information more effectively. This not only improves students' technical skills, but also builds their confidence in playing music collectively. These findings are consistent with previous research showing that the use of interactive media can accelerate the learning of musical skills while fostering learning motivation (Fauziyah et al., 2025).

Furthermore, the implementation of this application also strengthens the pedagogic aspect for students of the Madrasah Ibtidaiyah Teacher Education Study Program. With technology-based learning experiences, students not only learn to play angklung, but also gain music digital literacy skills that can be applied when they become teachers in elementary school. This approach supports 21st century education, where teachers are required to be able to integrate technology in the learning process without neglecting traditional cultural values (Saefina et al., 2025). This also reflects the effectiveness of digital learning media in creating a collaborative, participatory, and fun learning atmosphere, so that group harmony and active student involvement in the learning process are achieved (Slamet et al., 2021).

In addition to the pedagogic aspect, this study shows that the application of Angklung Bina Nusantara also contributes to cultural preservation. Angklung as a traditional musical instrument remains relevant because it is integrated with modern digital technology, so that students of the digital generation are still exposed to the values of local wisdom. These findings support the idea that the digitization of traditional music learning media is not only a practical solution to the limitations of means, but also a strategic means to maintain cultural sustainability (Nazara, 2026).

However, there are several obstacles that arise during implementation, such as differences in device specifications, unstable internet connections, and limited training time. The adaptive solutions implemented, including the use of backup devices, the offline mode of the application, and the setting of exercises on a rotating basis, show that the implementation of digital pedagogy must be accompanied by appropriate technical management for optimal learning outcomes (Rosyidah & Supriyanto, 2025). This confirms that the success of technology integration in learning depends not only on the application itself, but also on an adaptive, accountable, and collaborative implementation strategy.

Overall, the findings of this study confirm that the Angklung Bina Nusantara application is effective in increasing the musicality of students of the Madrasah Ibtidaiyah Teacher Education Study Program, strengthening digital music literacy, and supporting the preservation of traditional culture. The integration of digital pedagogy and multisensory learning in this learning practice proves that digital technology can be a catalyst for the transformation of art education, improving students' practical skills, and preparing them to become creative, adaptive, and professional teachers in the 21st century learning era.

#### 4. CONCLUSION

Based on the results of the research and discussion, it can be concluded that the use of the Angklung Bina Nusantara application has proven to be effective in increasing the musicality of students of the Madrasah Ibtidaiyah Teacher Education Study Program. Improvements were seen in pitch accuracy, rhythmic accuracy, and group play harmony, where the majority of students showed good to very good category scores after the intervention. This effectiveness is supported by the application of digital pedagogy, which allows students to practice independently, obtain instant feedback, and learn with high flexibility, as well as multisensory learning, which involves the visual, auditory, and kinesthetic senses simultaneously, thereby accelerating the mastery of musical skills.

In addition to increasing musicality, this application also has a positive impact on students' digital literacy, lecturers' pedagogic abilities, and the preservation of traditional culture. The integration of digital media allows students to understand the values of local wisdom through angklung instruments,

while lecturers can develop creative, adaptive, and collaborative teaching methods. The implementation of this application also confirms the importance of technology-based learning innovations in 21st-century education to create a fun, participatory, and effective learning experience.

Based on the findings of the research, it is recommended that Students of the Madrasah Ibtidaiyah Teacher Education Study Program make optimal use of the Angklung Bina Nusantara application for independent practice, so that their musicality skills continue to improve. Students are encouraged to integrate digital learning with physical instrument practice so that their collective skills in playing music are stronger. For lecturers of the Madrasah Ibtidaiyah Teacher Education Study Program and study programs, the use of application-based digital learning media should be part of the music teaching strategy, especially for students with diverse musical backgrounds. Lecturers are also advised to provide technical guidance and adequate device support so that all students can access digital media without barriers. In addition, for future researchers, it is recommended to examine the long-term effects of the use of digital applications on students' musicality and teaching ability in elementary schools, as well as explore the development of similar applications for other traditional musical instruments as an effort to preserve culture. With this approach, technology-based learning innovations can continue to be developed so that they have a wider impact on art education at the university level.

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