

**ENHANCING MUSICAL INTELLIGENCE USING AMKA APP IN FOURTH
GRADE OF SD SUPRIYADI 02 SEMARANG**

Wawan Priyanto*

* Universitas Negeri Yogyakarta, Indonesia

wawanpriyanto.2022@student.uny.ac.id

Ali Mustadi

Universitas Negeri Yogyakarta, Indonesia

ali_mustadi@uny.ac.id

Haryanto

Universitas Negeri Yogyakarta, Indonesia

haryanto_tp@uny.ac.id

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Abstrak

Beberapa kendala yang dihadapi guru sekolah dasar dalam mengembangkan kecerdasan musikal siswanya diantaranya guru kurang memiliki pengetahuan dan keterampilan dalam bidang musik, guru belum optimal memanfaatkan teknologi dalam pembelajaran musik, dan belum banyak media pembelajaran berbasis teknologi untuk pembelajaran musik. Penelitian ini bertujuan untuk mengetahui keefektifan penggunaan AMKA App untuk meningkatkan kecerdasan musikal siswa kelas 4 SD Supriyadi 02 Semarang. Penelitian ini merupakan penelitian kuantitatif dengan menggunakan desain *One Group Pretest-Posttest*. Subjek dalam penelitian ini adalah 29 siswa kelas 4 SD Supriyadi 02 Semarang. Hasil *posttest* menunjukkan bahwa 3 siswa termasuk dalam kategori musikal, 14 siswa termasuk dalam kategori cukup musikal, dan 12 siswa termasuk dalam kategori kurang musikal. Hasil *posttest* menunjukkan tidak ada siswa yang masuk dalam kategori sangat musikal dan tidak musikal. Hasil uji *N-Gain* juga menunjukkan bahwa 4 siswa yang tidak menunjukkan peningkatan kecerdasan musikal, 20 siswa menunjukkan peningkatan dalam kategori rendah, serta 5 siswa menunjukkan peningkatan dalam kategori sedang, dan tidak terdapat siswa yang masuk peningkatan efektivitas dalam kategori tinggi. Hasil ini membuktikan bahwa penggunaan AMKA App sebagai media pembelajaran efektif meningkatkan kecerdasan musikal siswa kelas 4 SD Supriyadi Semarang.

Keywords: Kecerdasan musikal, media pembelajaran, musik

Abstract

Some problems faced by elementary school teachers in developing their students' musical intelligence included teachers lacking knowledge and skills in music, teachers not optimally utilizing technology in music learning, and there are rarely technology-based learning media for music learning. This study aims to determine the effectiveness of using the AMKA App to improve the musical intelligence of 4th-grade students of SD Supriyadi 02 Semarang. This study is quantitative research using One Group Pre-test Post-test Design. The subjects in this study were 29 4th-grade students of SD Supriyadi 02 Semarang. The post-test results showed that three students belonged to the musical category, 14 students belonged to the Quiet musical category, and 12 students belonged to the less musical category. The N-Gain test results also showed that four students showed no improvement in musical intelligence, 20 students showed improvement in the low category, five students showed improvement in the medium category, and there were no students who entered the effectiveness improvement in the high category. These results prove that the AMKA App as learning media is effective in increasing the musical intelligence of grade 4 students of SD Supriyadi 02 Semarang.

Keywords: Musical intelligence, teaching media, music

INTRODUCTION

Musical intelligence is a part of the multiple intelligence's theory proposed by Howard Gardner. Children with musical intelligence have the ability to recognize tones, imitate rhythms, and make simple musical arrangements (Djohan, 2020). Musical intelligence is the ability and sensitivity a person has to recognize musical elements such as rhythm, melody, and timbre from the music heard, and has the ability to create musical works. Children with this intelligence tend to love to listen to songs, enjoy the song, and can even sing/play the song with the right tone.

Various studies have been conducted to prove the effect of musical intelligence on child development. Some of the effects of musical intelligence include helping children develop creativity, improving reading and language skills, and processing emotional, behavioral, and social skills. Children aged 6 to 7 years old who actively engaged in language learning by experimenting directly with rhythmic and melodic musical creations can increase non-musical creativity (Cuadrado, 2018). Other research also proves that musical intelligence used to facilitate one's pronunciation of English vocabulary. Music can be used as a powerful stimulus in helping students absorb language content (Daquila, 2023). Cultivating musical intelligence can be a factor in inhibiting adolescent aggressiveness, especially in the school environment (Penelope Giannopoulou, 2018). Rhythmic training has significant impact on maths competence (Rauscher, 2014). Another study conducted at Ohio State University concluded that participation in music activities like music lessons outside of school hours or

attending concerts with family, positively affects students' achievement in subjects such as maths or reading in primary and secondary school (Rauscher, 2014).

Previous researchers on musical intelligence provide insight into how musical intelligence has positive benefits for child development. We need an effort to improve children's musical intelligence, and there are still many opportunities to apply technology in an effort to improve children's musical intelligence. Today's primary school students belong to the Alpha generation. This generation was born between 2010 and 2025. Children of this generation are very comfortable with technology. Primary school students in Indonesia are accustomed to using various technologies, especially mobile applications (Purnama, 2018). However, based on the literature study, special applications are used in learning music in elementary school rarely.

Based on observations in grade 4 of SD Supriyadi 02 Semarang, the researcher found that support for development of musical intelligence in learning has not been maximized. Music learning has been conducted once a week. The technique of learning music in the classroom is only in the form of singing. The teacher gives the assignment to memorize a song or just write the lyrics on the blackboard and then sing it together without using musical accompaniment. The teacher said that she still has obstacles in teaching music. Teachers were graduates of Primary Teacher Education (PGSD), and the teacher felt a lack of knowledge and skills in music. Teachers did not fully utilize technology in music learning. The most widely used platform for teachers and students to get music and songs was YouTube. This platform has the disadvantage that the system is only one-way use. Students only hear and see content about music on YouTube. They cannot interact directly with this platform. They need to prepare their own musical instruments to play the musical instruments shown on YouTube.

The initial investigation of students' musical intelligence at SD Supriyadi 02 Semarang was also supported by the results of the musical intelligence test using AMKA. There were total of 29 students who took the initial test. The test results showed that 15 students were "Unmusical", 12 students were "Less Musical", and 2 students were "Musical Enough" categories. Initial investigations also showed that there were no students in the "musical" and "highly musical" categories. Details of the musical intelligence test results are shown in Figure 1.

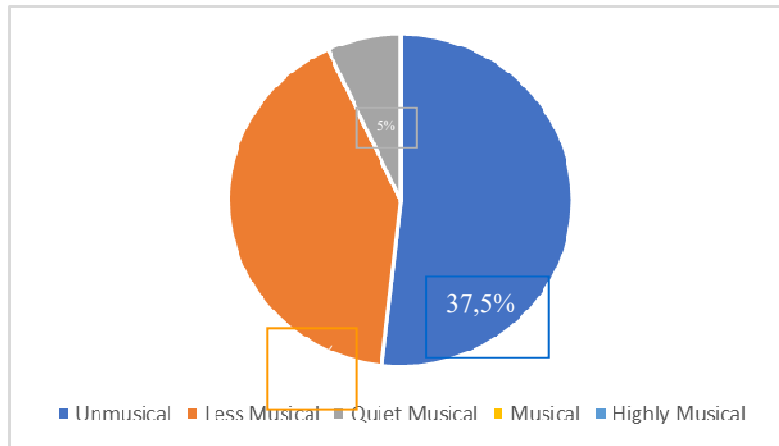


Figure 1. The Initial Investigation Of Students' Musical Intelligence At SD Supriyadi 02 Semarang

Students' knowledge of various mobile-based applications can provide opportunities to learn anything, anytime, and anywhere, including learning music to improve musical intelligence. The Various musical instruments can be played interactively in the application without having the original musical instrument. It can provide a solution for students who want to improve their musical abilities but lack music learning in class or do not have a musical instrument. Meanwhile, teachers can also utilize music applications to support music learning. Learning solfeggio using a mobile-based application called ChordIQ proved to be more fun and effective than the traditional approach (Ouyang, 2023). Thus, applications for learning music and improving musical intelligence are needed as a solution to the various problems encountered in the field.

Previous researchers have made efforts to improve children's musical intelligence. Bina Indri Hapsari, M. Syukri, and Abas Yusuf used the musical instrument "angklung" to increase the musical intelligence of children aged 5-6 years in kindergarten (Bina Indri Hapsari 2016). Wahyuningsih's research used percussion playing techniques to improve early childhood musical intelligence (Wahyuningsih 2019). Many previous studies used musical instruments to improve musical intelligence. The use of musical instruments has the disadvantage that not all schools in Indonesia have musical instruments. Another tool is needed that can be used in all schools. The use of technology can replace and facilitate teachers in improving musical intelligence. This research uses application-based technology to improve the musical intelligence of grade 4 elementary school students.

Based on the discussion above, the efforts made to overcome various problems in learning music are using the Children's Creation Music App (AMKA). This study aims to

determine the effectiveness of using the AMKA App to improve the musical intelligence of 4th-grade students of SD Supriyadi 02 Semarang. AMKA App is an application devoted to learning music for fourth-grade elementary school students between 9-12 years old. AMKA App applies to Android-based devices. It can be played interactively. The music learning menu available in the application includes recognizing notation, musical instruments, musical creations, and music intelligence tests. An overview of the AMKA App is shown in Figure 2.



Figure 2. AMKA App Design Cover

The application uses illustrations, text types, and colours according to the characteristics of children. Navigation and instructions on the app designed to be as easy as possible to facilitate its use. In this study, teachers used the AMKA App as learning media. The learning process uses the Problem-Based Learning model. Students in groups collect data about the elements of music in the AMKA App. Then students present their findings using worksheets and the AMKA App. The flow of music learning activities on the AMKA App can be seen in Figure 3.

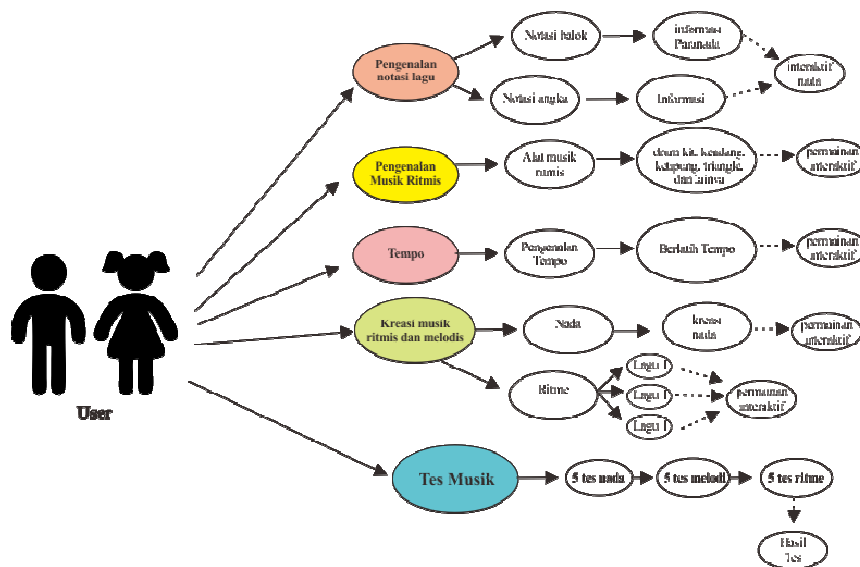


Figure 3. Use case diagram of AMKA App

METHODS

This research uses quantitative research using the One Group Pretest-Posttest Design. The subjects in this study were 4th-grade students of SD Supriyadi 02 Semarang, totaling 29 students. The sampling technique involved only one group of subjects or participants. They were tested twice: before (pretest) and after (posttest) in certain treatment or intervention was given (Sukarelawa 2024). The data collection technique used documentation in the form of a musical intelligence test. The documentation was used to obtain data on the results of musical intelligence scores. This study aims to determine the correlation of the effect of using AMKA App learning media to improve the musical intelligence of fourth-grade students of SD Supriyadi 02 Semarang. An overview of the independent and dependent variables is shown in Figure 4.

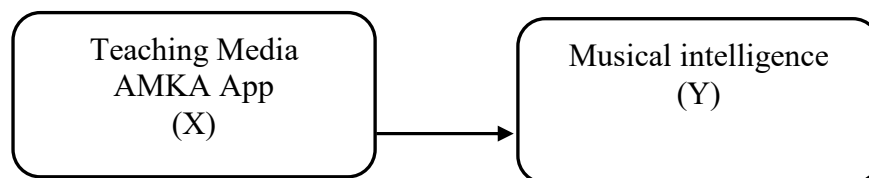


Figure 4. Independent and Dependent Variables

The musical intelligence test in this study adapts the musical ability test developed by Hanna Sri Mudjilah (Mudjilah, 2014). The musical intelligence test is packaged in the form of a test application (Wawan Priyanto, 2023). The musical intelligence test displays the navigation flow and menus available in the application. Musical intelligence test activities for elementary school children are shown in Figure 5.

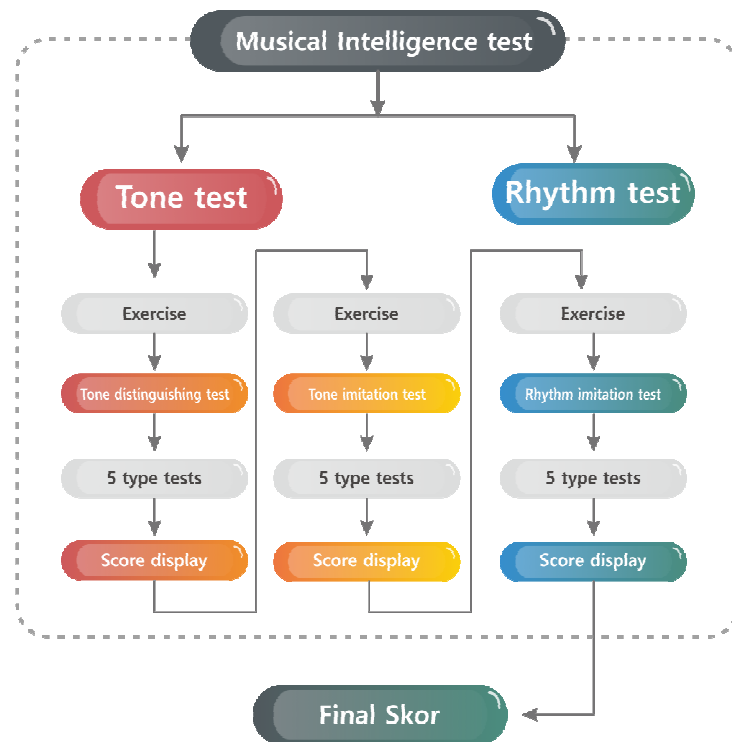


Figure 5. Musical Intelligence Test Activity

After passing the test such as imitating the tone, distinguishing the tone, and imitating the rhythm, the user will get a display of the score results. The total correct score is 300. The music intelligence category on each score is shown in Table 1.

Table 1. Scoring Categories of Musical Intelligence Test

Categories	Score
Highly Musical	240-300
Musical	179-239
Quiet Musical	118-178
Less Musical	57-117
Unmusical	0-56

The test data was analyzed with the independent sample test and N-gain score. The Independent sample test analysis was conducted to see the difference in test scores between pretest and posttest. The N-gain score was conducted to determine the effectiveness of using AMKA in increasing musical intelligence. The n-gain score can be calculated with the formula:

$$N\text{-gain } (g) = \frac{X_{\text{posttest}} - X_{\text{pretest}}}{X - X_{\text{pretest}}}$$

X_{posttest} = Score *posttest*

X_{pretest} = Score *pretest*

X = Maximun score

The results of the N-gain calculation were then interpreted following the criteria in Table 2.

Table 2. N-gain Interpretation Criteria

N-Gain Value	Interpretation
$0,70 \leq g \leq 100$	High
$0,30 \leq g < 0,70$	Medium
$0,00 < g < 0,30$	Low
$g = 0,00$	No increase
$-1,00 \leq g < 0,00$	Decrease occurred

(Sukarelawa, 2024)

The standard gain value obtained is categorised in percentage as follows.

Table 3. Category Percentage N-gain score Students

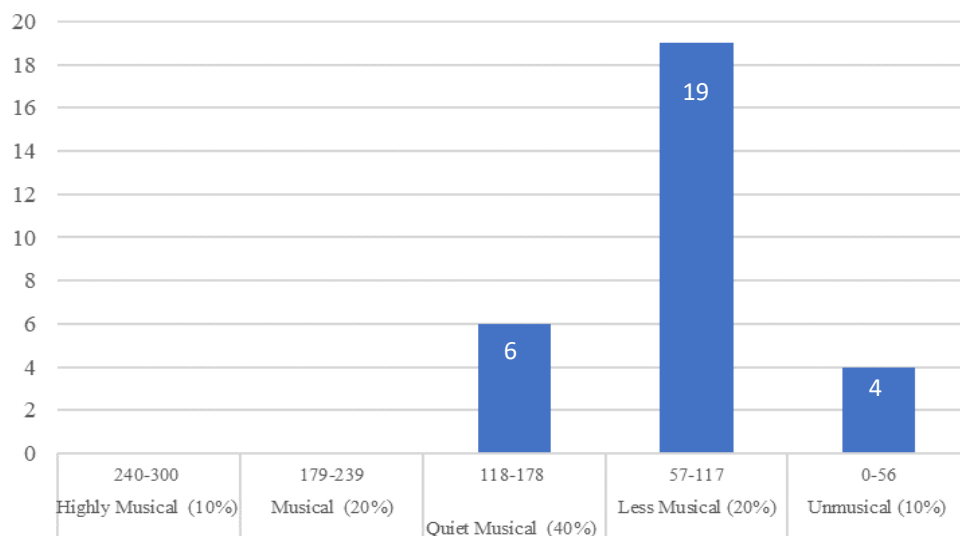
Percentage	Categories
< 40	Not Effective
40-55	Less Effective
56-75	Moderately Effective
>75	Effective

RESULTS AND DISCUSSION

The learning was conducted using AMKA App and Problem Based Learning (PBL). The PBL learning model has a syntax consisting of five stages of learning: (1) organizing students into problems, (2) organizing students to learn, (3) assisting independent and group investigations, (4) developing and presenting works and exhibitions, and 5) analyze and evaluate the problem-solving process (Agustina , 2017).

The researcher conducted a pre-test using a musical intelligence test before learning using the AMKA App. The pre-test results showed that grade 4 students of SD Supriyadi fell into three categories, quiet musical, less musical, and unmusical. There were no students in the highly musical and musical categories. There were six students in the quiet musical

category, 19 students in the less musical category, and four students in the unmusical category. The results of the musical intelligence pre-test are shown in Graph 1.



Graph 1. Pre-test Results of Musical Intelligence

The teacher started the lesson by giving problems about tone and rhythm in music. The teacher divided the class into five groups. Each group got a worksheet. The teacher explains the work steps and technicalities of using the AMKA App. Students use the AMKA App to find information about pitch and rhythm. The learning process using the AMKA App is shown in Figure 6.



Figure 6. Learning Activities Using The AMKA App

The lesson continued with each group's presentation using the AMKA App. Each group plays the tones and rhythms according to their creations. The teacher evaluates and provides explanations at the end of the lesson. After the lesson was over, the researcher conducted a post-test. The post-test results were obtained from the musical intelligence test

results on the test menu in the AMKA App. The test was conducted by 29 students. The test process is shown in Figure 7.

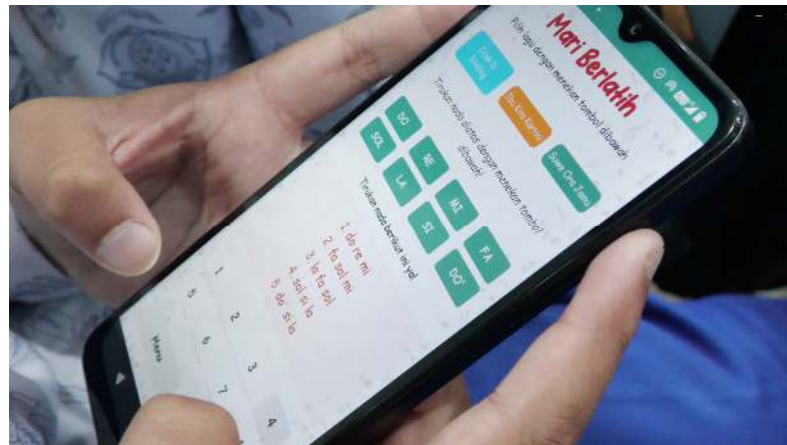
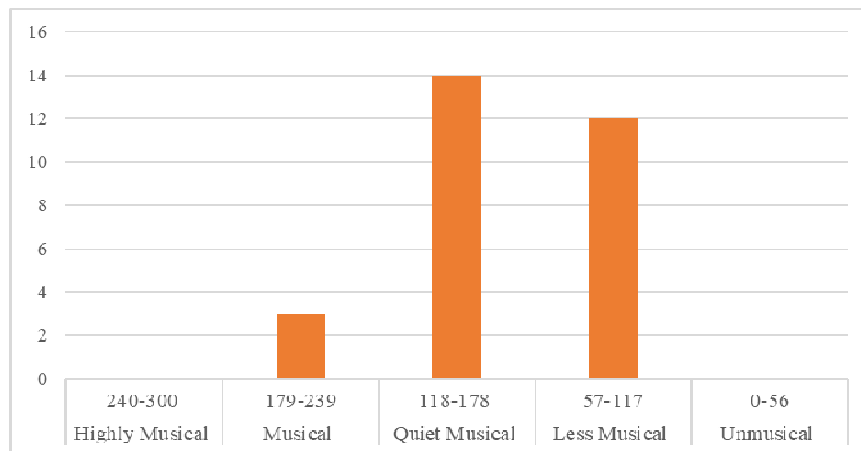


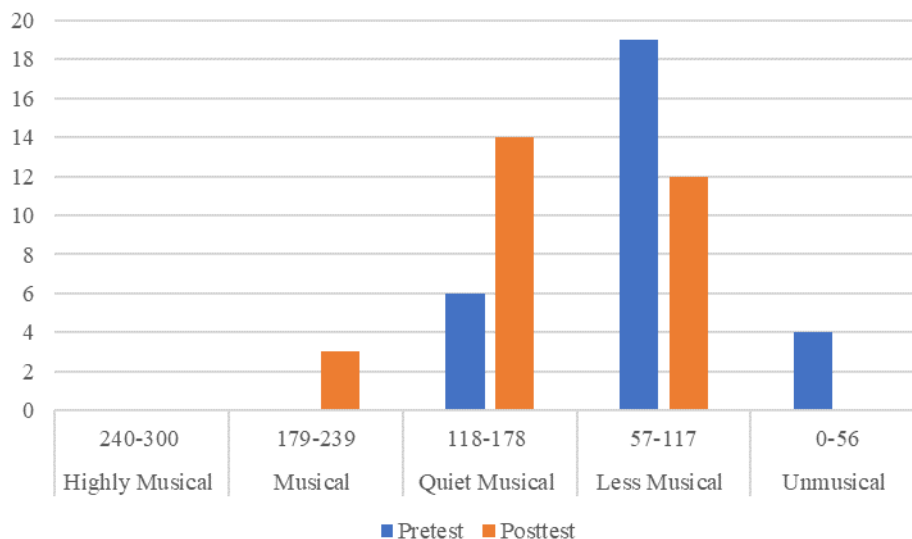
Figure 7. Pretest And Posttest Using The AMKA App

Each student took turns using their mobile phone to take the test. There were fifteen questions contained in the post-test. Students seemed to be proficient in taking the musical intelligence test. The post-test results showed a positive increase in each category of musical intelligence. The post-test results are shown in graph 2.



Graph 2. Post-test Results of Musical Intelligence

There were three students in the musical category. The quiet musical category has 14 students, and the less musical category has 12 students. The post-test results showed that there were no students in the highly musical and unmusical categories. A comparison of pre-test and post-test results is shown in graph 3.



Graph 3. Musical Intelligence Pre-test and Post-test Results

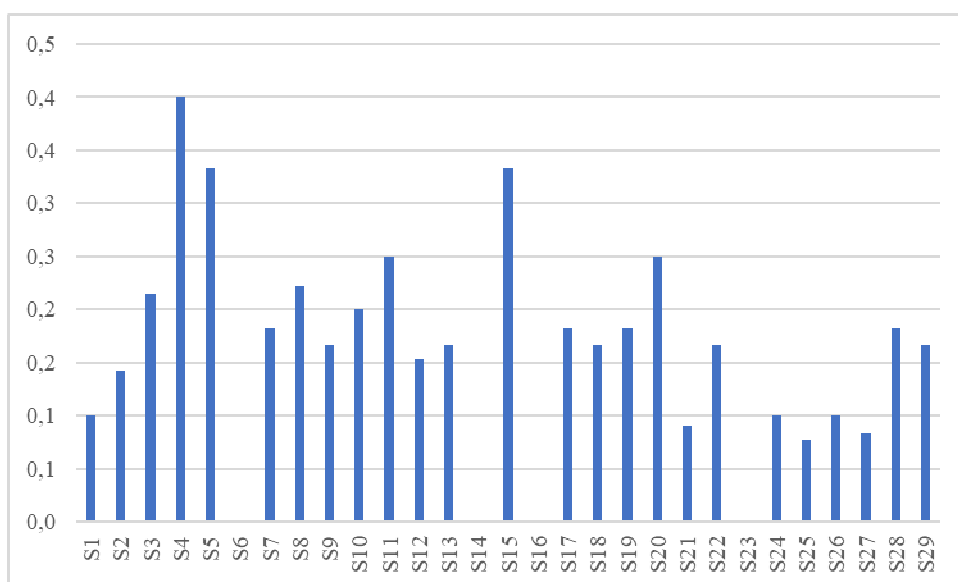
There was an increase in the average pre-test and post-test in each category of musical intelligence. Even, students not found in the unmusical category in the post-test, show that there is an effect of learning using the AMKA App on musical intelligence. The average results in each category of musical intelligence are shown in Table 4.

Table 4. The Average Pre-Test and Post-Test of Musical Intelligence Test

No	Musical intelligence category	Pre-test average	Post-test average
1	Highly Musical	0	0
2	Musical	0	627
3	Quiet Musical	888	2072
4	Less Musical	1653	1044
5	Unmusical	120	0
	Mean value	532,2	748,6

Based on the table above, the average increase in pretest and posttest is in the less musical and quiet musical categories. While on the average posttest, there were no students in the unmusical category, this shows that there is a good influence on children's musical intelligence. Based on the data, there were no 4th-grade students of SDN Supriyadi Semarang in the highly musical category.

The next research step was measuring the N-Gain test. The N-Gain test was used to measure the effectiveness of using the AMKA App for musical intelligence. The N-Gain approach measures the relative change between the level of understanding of learners before and after the implementation of learning. The results of the N-Gain test for each student are shown in graph 4.



Graph 4. The Results of The N-Gain Test Each Student

The N-Gain test results show that there were no students who got scores under 0 or minus. This shows that the interpretation of the N-Gain value does not decrease. There are four students whose N-Gain score is 0, which indicates that there are four students who do not experience an increase in musical intelligence after participating in learning. There are 20 students whose N-Gain test results are <0.30 , which indicates that there is an increase but not significant and falls into the low category. There are five students whose N-Gain test results are between $0.30 \leq g < 0.70$, which indicates that there is an increase but not significant and is in the medium category. There were no students who increased in effectiveness in the high category.

The N-gain results prove that the AMKA App can improve students' musical intelligence. In line with Djohan's opinion that musical intelligence is the capacity to feel, distinguish, transform, and express musical forms (Djohan , 2020). Through the AMKA app, students can learn to distinguish tones, imitate melodies, distinguish rhythms, imitate rhythms, and make simple musical creations. The use of this Android-based application is proven to have an influence on learning music. Other studies have also proven the use of AR Musical App for Children's Musical Education can increase students' sensitivity to music (Correa , 2016). Students' learning motivation also increases when learning using gadgets. Students prefer apps that have a high frequency of visual stimulation, are easy to navigate, and/or have familiar music (Burton , 2015).

CONCLUSION

Based on the results of the musical intelligence test, the AMKA App proved to be effective in improving the musical intelligence of grade 4 of SD Supriyadi 02 Semarang. There was an increase in the pretest and posttest scores. A total of 25 students whose post-test results improved, while four students did not improve. The post-test results show that three students were in the musical category, 14 students were in the Quiet musical category, and 12 students were in the less musical category. The post-test results showed that there were no students in the highly musical and unmusical categories.

Based on the N-Gain test, shows that there were no students who scored under 0 or minus. It shows that the interpretation N-Gain value does not decrease. The N-Gain test results also showed that four students did not show an increase in musical intelligence, 20 students showed an increase in the low category, five students showed an increase in the medium category, and there were no students who increased in effectiveness in the high category. These results prove that the use of the AMKA App as a learning media is effective in increasing the musical intelligence of grade 4 students of SD Supriyadi Semarang. The use of AMKA in Grade 4 music learning has an impact on increasing children's musical intelligence, creating fun learning, and producing new music teaching concepts using technology. The teachers of Elementary schools can utilize technology in teaching. This study only used one school as the object of the trial. Further research can use more research subjects so that the comparison of effectiveness is more valid.

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