JPKS (Jurnal Pendidikan dan Kajian Seni) Vol.10, No.2, Oktober 2025
p-ISSN : 2503-4626
e-ISSN : 2528-2387

ARTIFICIAL INTELLIGENCE TO HONE MUSICAL ABILITY IN MUSIC LEARNING AT THE JUNIOR HIGH SCHOOL LEVEL

Hana Permata Heldisari[1]
Pendidikan Seni Pertunjukan, FSP, Institut Seni Indonesia Yogyakarta, Indonesia[1]
E-mail: hana.permata@isi.ac.id

Abstract: *The existence of Artificial Intelligence (AI) tools still offers many benefits and advantages. Various AI tools in the music field such as Soundful, AIVA, Ecrett Music, and Boomy have been proven to help produce a composition but reap pros and cons around copyright as well as the creative process of the creator. This research aims to find out how to use AI in music learning without eliminating creativity or essence from creating a work. This study uses a qualitative approach, namely exploratory research with a type of case study using the Miles and Huberman analysis model, namely data collection, data reduction, data presentation, and conclusion drawn. The object of this study is AIVA as one of the AI products in the field of music. The subjects of this study are 30 students in grade IX of SMP SMPN 6 Yogyakarta. Data collection using in depth interview techniques, non-participant observations, and documentation so that it will be validated using triangulation techniques. Meanwhile, secondary data sources are obtained through documentation in the form of product results using AI. The results of this study state that learning using AI also emphasizes students' skills in the aspect of musical ability from the Music Aptitude Profile (MAP) by Gordon, namely tonal imagery (melody and harmony), rhythm imagery (tempo and meter), and musical sensitivity (phrasing, balance, and style). The learning results obtained produce more creative and harmonious songs because they provide direct experience related to the sensitivity of tone to chords and rhythms produced by AIVA.*

Keywords: *AIVA; music; SMP; musical ability*

Abstrak: Keberadaan *tools Artificial Intelligence* (AI) tetap menawarkan banyak manfaat dan keuntungan. Berbagai *tools* AI di bidang musik seperti Soundful, AIVA, Ecrett Musik, dan Boomy terbukti dapat membantu menghasilkan sebuah komposisi namun menuai pro kontra seputar hak cipta juga proses kreatif pencipta. Penelitian ini bertujuan untuk mengetahui bagaimana pemanfaatan AI di pembelajaran musik tanpa menghilangkan kreativitas atau esensi dari menciptakan sebuah karya. Penelitian ini menggunakan pendekatan kualitatif yaitu *exploratory research* dengan jenis studi kasus. Objek dalam penelitian ini adalah AIVA sebagai salah satu produk AI di bidang musik. Subjek penelitian ini yaitu 30 siswa kelas IX SMPN 6 Yogyakarta. Pengumpulan data dengan teknik *in depth interview*, observasi non partisipan, dan dokumentasi sehingga akan divalidasi menggunakan triangulasi teknik. Sedangkan sumber data sekunder diperoleh melalui dokumentasi berupa hasil produk menggunakan AI. Hasil penelitian ini menyatakan bahwa pembelajaran menggunakan AI menitikberatkan keterampilan peserta didik dalam aspek kemampuan musikal dari *Music Aptitude Profile (MAP)* oleh Gordon, yaitu *tonal imagery (melody and harmony*), *rhythm imagery (tempo and meter*), dan

musical sensitivity (phrasing, balance, and style). Hasil pembelajaran yang diperoleh menghasilkan lagu yang lebih kreatif dan harmonis karena memberikan pengalaman langsung terkait kepekaan nada terhadap akor dan irama yang dihasilkan oleh AIVA.

Kata Kunci : AIVA, musik, SMP, kemampuan musikal

INTRODUCTION

In the context of Industry 4.0, artificial intelligence is considered a key component of industrial transformation that enables intelligent machines to perform tasks autonomously, such as interpretation, diagnosis, and analysis. These intelligent machines support creative industry players, such as creators, brands, and agencies, in forecasting maintenance needs and reducing downtime in production and marketing campaigns (Hanifa, Sholihin, & Ayudya, 2023).

Artificial intelligence (AI) is a part of computer science that aims to make machines or computers capable of performing tasks that previously could only be done by humans. Initially, the role of computers was only limited as a calculation tool. The primary goal of artificial intelligence is to enable computers to perform tasks that typically require human thinking, analysis, decision-making, and problem-solving (Pongtambing et al., 2023).

There are three artificial intelligence opportunities, namely assistance in research, development of learning materials, and virtual assistants (Hakim, 2022). This research aid can be like looking for an idea or idea to start research. While the development of learning materials, such as the existence of updated information that was previously unknown, on virtual assistants, such as question and answer bots on lecture material if someone misses communication and information. Furthermore, artificial intelligence challenges such as technical skills, resource availability, and role replacement. This must be prepared so that this challenge does not harm the younger generation.

The use of AI in the field of music also has various functions ranging from determining chords,

composing lyrics, choosing a genre, and even making a musical composition (Zulić, 2019). Some of the music AI fields that are often used include Soundful, Aiva, ChatGPT, Ecrett Music, and Boomy. However, in this study will only discuss AIVA.

Aiva (Artificial Intelligence Coaching Emotional Contract Music) is a website that offers a unique experience in creating music, be it as a backsound or soundtrack. AIVA offers a wide variety of music genres that you can explore and adapt to your needs. It allows composers and content creators to create original works or upload their works to create new variations. The Aiva Technologies team is developing AI scripts that can create emotional soundtracks for commercials, video games, or movies. In addition to allowing users to create music from scratch, AIVA can also be used to generate variations of existing songs (Zulić, 2019). A 2023 study by Mahendra on the legal analysis of songs created by artificial intelligence in commercial use based on intellectual property rights in Indonesia states that although there are no regulations that specifically regulate artificial intelligence sounds, copyright laws and related rights products can be a reference for protecting individual rights related to recorded sounds. Phonogram producers and broadcasters can file a lawsuit if their sound is used without permission, but the evidence required in this case can be problematic. Therefore, it is important for the party controlling the AI to ensure that they have valid permission to use the recorded sounds used in the AI's work (Dai, 2021). However, research in 2020 by Daniel Dennett on motivations for using artificial intelligence in the popular music composition and production process states that technical innovations in AI have given composers and producers of popular music powerful tools for music creation. Traditionally, most AI tools for music production and composition have academic purposes (Jiang, 2022). Commercial applications of the underlying technology are increasingly being explored by tech giants such as Google and IBM, as

well as smaller independent companies such as Amper Music and AIVA. Will the use of AI also cause problems in education?

Smart education, cutting-edge virtual learning, forecasting, and data analytics are all part of artificial intelligence-powered education. In the era of society 5.0, artificial intelligence (AI) has been used in life, one of which is in the field of education. The use of artificial intelligence in the field of education is as a medium and supporter of learning. The use of artificial intelligence as a learning medium can help teachers, educators, and mentors in delivering learning to learners and make learners easier to understand learning. A 2023 study by Pongtambing et al. on the opportunities and challenges of artificial intelligence for the younger generation provides a statement that the use of artificial intelligence will benefit human resources when used in accordance with the context of their knowledge (Pongtambing et al., 2023). However, artificial intelligence can be dangerous if it is not used in accordance with the exact sciences (Yu & Ding, 2020). In the use of artificial intelligence, humans must understand their role as learners. Thus, the use of intelligence can also be applied in language learning, including music learning.

Music learning at the junior high school level involves singing solo, playing simple musical instruments, singing folk songs, playing traditional musical instruments, analyzing songs, creating songs, and presenting musical instrument games (H P Heldisari, 2020). The mistake that often occurs during this time is to assume that music education is in the form of knowledge of musical notation, while the basics of music called musicality (musical taste) are more neglected (YETTI & KHAIRIAH, 2017). Creativity is the ability to reconstruct ideas to solve problems and activities and create an innovative and varied creative work that is valuable and useful for creators and others. Bandem states that creativity is the source of all art, science, and technology (Webster, 2016). In fact, all human cultures are produced from creative thinking and

imagination. Practice is a test of how artists enhance their creativity through their chosen materials and techniques (Hana Permata Heldisari & Ramadhan, 2021).

Creativity in music is a style of thinking and activity of a person in music. From the activity and style of thinking, a person is able to produce a piece of music and analyze it. So that in reality the process of creativity is in the form of musical works and musical analysis (Hana Permata Heldisari & Astuti, 2018). Musical creativity is the ability of a person to create a song, instrument, or arrange new music that has never been created by others, and the results of the song and music can be enjoyed by others (Wall, 2018). In musical ability, creativity holds the main key when someone wants to create a work that is original, different, and more advanced than the existing ones, as well as with the power of imagination that must develop because someone needs to play with ideas in interpreting songs. The relationship between creativity and musical ability is very close because the activity of creating, arranging, or even analyzing a song is a process of creativity by a person both in process and product. With creativity, music plays a role as a whole, not only in the form of a series of melodies.

From these materials, it is possible to utilize AI technology in the learning process. However, will it eliminate the creative process and the essence of learning in students? Or it allows to hone more in the musical aspects that are present in the student. This certainly needs to be studied further so that the usefulness of AI can be channeled wisely and not mistaken.

Therefore, it is important to research the usefulness of AI in music learning at the junior high school level, especially for those who do not have the infrastructure of musical instruments for learning. Artificial intelligence has been widely used for various needs. It is necessary to study the correct use of AI in learning so as not to eliminate the creative process of students in creating a work. AI in the field of music pours a lot of controversy, especially related to copyright.

p-ISSN : 2503-4626
e-ISSN : 2528-2387

Therefore, research is needed to overcome these problems, especially in the learning process. In addition, the need for provisions that educate in the field of music, especially at the junior high school level, in order to use AI wisely.This study aims to describe the benefits of AI in music learning at the junior high school level in order to determine whether it is really necessary and useful to use AI.

METHOD

This research is a qualitative approach (exploratory research) with a case study method because this research explores the use of AI in music learning at the junior high school level. The object of this study is AIVA as one of the AI products in the field of music. AIVA was chosen by considering the results of the music produced are still monotonous; this is a consideration so that learners are able to process the song well even though the music is very simple. In addition, the use of AIVA is also easy. The subjects of this study were 30 students of Class IX SMPN 6 Yogyakarta. Consideration of the class was chosen because the music art material that will be used for research is the song-making unit, which is in Class IX. The location of the study was chosen by considering the existing facilities and infrastructure in schools for music learning. In SMPN 6 Yogyakarta, there are no musical instruments for learning the art of music.

Primary data sources were obtained through data collection with in-depth interview techniques, non-participant observation, and documentation so that it will be validated using triangulation techniques. While the secondary data source is obtained through documentation in the form of product results using AI. Observation is used to observe the learning process using AI, while interviews are used to explore information about the learning process, achievements, and obstacles that exist during learning. Data analysis techniques using the Miles and Huberman analysis model are data collection, data reduction, data presentation, and conclusion.

Data collection is carried out continuously until the data is saturated (Weyant, 2022). Data

p-ISSN : 2503-4626
e-ISSN : 2528-2387

reduction is done as a process of selection, concentration, attention, simplification, abstraction, and transformation of rough data that emerges from field records so that the data gives a clearer picture of the results of observations, interviews, and documentation. After the data is reduced, the information that is arranged gives the possibility of drawing conclusions and taking action. The presentation of data is carried out in tabular and narrative form. Through the presentation of the data, the data is organized so that it will be easier to understand. Finally, the researcher makes a conclusion based on the data that has been processed through data reduction and display. The conclusions drawn are temporary and will change if there is no strong evidence to support them at the next stage of data collection. However, if the conclusions put forward at the initial stage are supported by valid and consistent evidence when the researcher returns to the field to collect data, the conclusions put forward are credible conclusions (Creswell, 2020).

RESULT AND DISCUSSION

Music Learning using AIVA

Music learning in junior high school in Class VII with an independent curriculum is divided into 4 units, namely solo singing, playing simple musical instruments, singing together, and playing ensembles. Class VIII is divided into 4 units, namely folk songs, traditional musical instruments, foreign music, and Asian music performances. Then in Class XI with an independent curriculum divided into 6 units, namely singing and making simple creations, analyzing songs, presenting music, music documentation, making songs, and music appreciation. From the summary of the material of each unit at each level, the use of artificial intelligence will be maximized in Class IX, although at each level there is singing material. However, students' knowledge is more complete when entering class IX because they have received material on solo and joint singing techniques, knowledge of diatonic and pentatonic tone systems, as well as singing ornaments in the material to make

p-ISSN : 2503-4626
e-ISSN : 2528-2387

simple creations. Therefore, this study is focused in Class IX when entering the material of Unit 5, namely making songs.

This is in accordance with the 5th learning achievement in outline each year, namely (1) students are able to make simple creations and sing them in the way that has been taught; (2) students are able to elaborate and perform simple analysis of music/national compulsory songs and regional songs; (3) students are able to play music and make simple music offerings; (4) students; (5) students are able to create simple songs; (6) students are able to document songs into the form of song scripts and audio; and (7) students have the ability to do music appreciation by making reviews.

The use of AI in this learning is as a learning medium because it can be one way out for schools or students who do not have musical instruments. The AI used is AIVA. AIVA is a website that offers a unique experience in creating music, be it as a backsound or soundtrack.

Composing and composing music is a creative thinking skill in music that is one of the long-term learning goals. However, before reaching the stage of composing music, some educators advise students to start from a simpler form of arranging existing songs or performing a planned or spontaneous improvisation. In more basic education, it refers to simple creations. Baker (1980) mentions creation as one of the effective musical learning tools to improve children's skills musically and, if applied properly, can be a link for various purposes of music education. Chandler (2018) explains the importance of creation as part of music education, causing the aspect to appear in various educational curricula such as Kodaly's method, Euritmis Dalcroze, and Gordon's Music Learning Theory.

In addition to having a variety of musical benefits, such as improving understanding of musical structure, the process of making creations also has a positive impact psychologically and socially. Learners who learn to create have a

space of expression for psychological aspects such as emotions, and cognitive creativity includes imitation, memory, and motive development. When creating collectively, there is an interaction between students that allows them to learn to listen to the opinions of others, consider the execution of personal ideas with the approval of the group, and identify the role of themselves in the group. Various musical and nonmusical benefits in the process of music creation led to various methods and approaches to apply this concept in music learning in the classroom.

Before entering the learning to make songs, learners are given a diagnostic assessment to ensure they have known the simple structure of the song, namely intro, verse, bridge, chorus, interlude, modulation, ending, and coda. In this lesson, at least students can make a song consisting of verse, brigde, and chorus. After understanding the structure of the song parts that have been described, the next process is to create a song.

The first meeting in making a song is to determine the theme of the song. The theme song can be used as an initial source of ideas or ideas in song creation. There are various themes that can be used as a source of inspiration, such as beauty, environment, family, education, spirituality, social criticism, romance, sadness, and anger, among others. The theme is determined by the teacher so that the evaluation criteria are not too broad. Learners are divided into 5 groups, each group consisting of 6 people. One of the processes of making a song can be done by using the inspiration of a picture. Teachers can display or show a picture to be used as a source of inspiration for songmaking. The theme offered to students is friends.

When learners have determined the theme, the next step in the first meeting is to determine the title of the song. The title of the song is a derivative of the theme that has been determined at the beginning of the song creation process. The title of the song usually describes the story or the big meaning in the song to be conveyed. Some of the song

p-ISSN : 2503-4626
e-ISSN : 2528-2387

titles the results of thinking learners are *Langkah Kita Bersama, Sahabat dalam Cerita, Satu Hati Satu Impian , Pelangi Persahabatan, Selalu Bersama*.

After determining the theme and setting the title, the next task for learners is to string words. Stringing words has its own challenges because the process requires the right relationship between one word and another so as not to produce multiple interpretations for the listener. A series of suitable words will produce charming song lyrics. Charming song lyrics can lead the listener to feel certain emotions in accordance with the emotions that the songwriter wants to convey to others. At the stage of stringing words, the creator is still doing the process of replacing, adding, and subtracting until finding the desired lyrics and in accordance with the intent to be conveyed. As for some of the results of the activities, they are stringing words.

In the second meeting, students were asked to forward the results of the activities of stringing words into lyrics. Good song lyrics can usually be performed also in the form of poetry. Some songwriters actually create songs from poems they create first. There are song lyrics that pay attention to the same rhyme or final sound in each sentence. However, this material suggests that teachers provide freedom for learners to explore their language skills without being bound to certain rules.

In the third meeting, the teacher and the students use AIVA to create songs based on the genre of choice of the students. The stages of making music with AIVA are visiting the official Aiva website and logging into an account. After logging in, a new window will open. Find the "Create Track" button in the left corner of the screen and click on it. The second step in the next window is to choose a preset or search for a specific one using the search bar as in Figure 3. The third step is to click the "Create" button, then set the "Key Signature and Duration" to determine the basic tone and duration of the music as in Figure 3. The basic tone is leveled in C major and is 3 minutes in duration. Preset variants can also be changed

p-ISSN : 2503-4626
e-ISSN : 2528-2387

to the desired "number of intruments" value. When finished, click the "Create tracks" button. At this third meeting, students sorted out which music results were interesting to them for the songs they would write. The music choices chosen from AIVA include EDM, HipHop, FolkRock, and Solo Piano (Pop).

In the fourth meeting, students began to create a melody for the lyrics they had made. At the stage of providing melodies, learners as songwriters are very likely to make changes to the words or sentences of the lyrics to find the point of conformity between the lyrics and the melody of the song. On the other hand, there are usually different stages in the song creation process. Some songwriters start creating songs by composing melodies first, followed by the process of writing lyrics. The stage may be done by the creator of the song freely because there is no patent sequence in the creative process. However, in learning for beginner musicians, in this case students, teachers are advised to guide students by writing lyrics first. . At this stage, it is different from making songs in classes that do not use AIVA. Here the melody is arranged according to the chord progressions and rhythms that already exist from AIVA.

In the fifth meeting, students are still refining the results of the lyrics and melody by discussing between group members. After it has been agreed, each group gives the results of their work to the teacher to get corrections and explanations from the teacher. Learners describe what they know about the music they choose as EDM, HipHop, FolkRock, and Pop (solo piano). Then tell the lyrics they made and demonstrate the melody because learners have not yet reached the stage of writing notation. After getting feedback from the teacher, the students again discussed agreeing on the final results that will be presented at the next meeting. In the sixth meeting, students presented the results of the song made in front of the class.

Learning to make songs with the help of AI as the music runs smoothly and requires a minimum of 6 (six) meetings. Learners seem enthusiastic about learning new

p-ISSN : 2503-4626
e-ISSN : 2528-2387

things using AI after usually dominant learning by observing activities through YouTube. Teachers are also more happy because they can provide musical experiences to develop students musical sensitivity, even though the school does not have adequate infrastructure in the field of music. This is considered more able to develop musical sensitivity than the previous year, when students create songs with the stages of making lyrics and then write notation, then they read from the notation. Such a move makes them already limited by music theories when writing notation, such as adjusting the number of beats and pitch intervals. So that even though they have not been sung, they feel not fit or not good. After the notation is finished, it feels stiff because they are burdened with reading the notation while adjusting the lyrics they make, plus there is no accompanying music. While through this new stage, learners are more free to explore the tones with the provision of listening to the melody they make, whether it sounds comfortable with the existing music. They also learn whether they sing in a scale that matches the music. This achievement is certainly more in line with the essence of art education in formal schools, which provide musical experience by fostering musical sensitivity and musical ability that is expected to be useful for social-emotional learners.

Musical ability through AIVA-assisted music learning

Students in Junior High School Class IX are at the age of early adolescence, where they begin to experience significant changes in physical, emotional, and social. This learning is carried out by the group method, considering the social development of friends began to be very important. Therefore, learners need to learn more. How to build a social relationship to be comfortable in everyday life. Music learning with AI is designed taking into account the characteristics of early adolescence so that the process is carried out according to interest, namely in the selection of music and in groups because in early adolescence students need to learn to build social relationships.

p-ISSN : 2503-4626
e-ISSN : 2528-2387

The AI in music learning used is AIVA. Music learning with AIVA is applied in Class IX with consideration that students have acquired basic knowledge about singing techniques, playing music, knowing traditional songs and music as well as Asia, and getting material about notation in the music documentation unit. Utilization of AIVA is used as an alternative to schools that do not have musical instruments. Because in fact, there are still schools that do not have musical instruments or have some musical instruments but no treatment. Therefore, AIVA can be used to provide a musical experience while still in accordance with the achievements that have been designed. In addition to achieving learning goals, learners explore knowledge about the music they choose, such as what is EDM, HipHop, FolkRock, and Solo Piano (Pop).

In this learning, students compose song lyrics first, then choose the music they like; after that, students just start composing the melody of the song to the rhythm and chord progressions that already exist. It certainly requires a sense of rhythm, a sense of pitch, and a sense of harmony. They were asked to sing first instead of writing so that the results of their work were not limited or fenced off by music theory, so that they could maximize their musical sensitivity from what they heard. This is in accordance with the statement that proficiency in mastering musical instruments and reading notation is only an automatic participation in the process of music education (Djohan, 2009). This learning step also emphasizes the skills of learners in the musical ability aspect of the Music Aptitude Profile (MAP) by Gordon, namely tonal imagery (melody and harmony), rhythm imagery (tempo and meter), and musical sensitivity (phrasing, balance, and style). In addition, it is also in accordance with the aspects of musical sensitivity, according to Djohan (2009). has sensitivity to tone, has sensitivity to timbre, has sensitivity to rhythm patterns, is able to listen to melodies, easily perceive music, know the

p-ISSN : 2503-4626
e-ISSN : 2528-2387

structure of music, and can express music/song.

Learners have a sensitivity to pitch; that is, they can compose melodies with existing chords. It also gives the ability to listen to melodies and develops sensitivity to rhythmic patterns. Learners know the structure of music; in this learning, learners learn the song with verse, bridge, and chorus structure. Learners are also able to express the song according to the meaning of the song. While the sensitivity to the new timbre is limited to analyzing the sound produced from the AIVA, what instrument? Therefore, the AIVA application is held by the teacher because it is a written instrument produced by AIVA.

CONCLUSION

The application of artificial intelligence in music learning in schools can help students express their problems in the process of music learning, cover a variety of rich music resources, and provide students with the music learning resources they need to improve the efficiency of music education and learning. But in music education may also have some limitations: first, derived from the limitations of the specificity of music education. The application of artificial intelligence in music education mainly plays a supporting role, such as the ability to create tone, rhythm, and harmony, but for emotional aspects such as musical emotion., dynamics, and ornament, artificial intelligence has certain limitations. Secondly, it comes from the limitations of industry recognition. Artificial intelligence technology in music still needs to be widely recognized and accepted by the industry, also related to the pros and cons of IPR. Therefore, in utilizing AI for music learning, the right strategy is needed so that it is not abused and can actually provide a musical experience for learners.

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