The use of the Synthesia application to simplify Angklung learning

J Julia¹*, D Kurnia¹, I Isrokatun¹, H Wulandari², and I Aisyah³

¹ Prodi PGSD Sumedang, Universitas Pendidikan Indonesia, Bandung, Indonesia
² Prodi PGPAUD, Universitas Pendidikan Indonesia, Bandung, Indonesia
³ Prodi Keperawatan, Universitas Pendidikan Indonesia, Bandung, Indonesia

Abstract. The majority of students in the department of pre-service elementary school teacher cannot read the notation correctly. However, they have a strong motivation to learn music composition, such as angklung music composition. This paper aims to analyze the development of students who are members of the music community in studying the composition of angklung music by using the Synthesia application. The research method was carried out in the following stages: (1) making angklung musical composition in the type of MIDI (Musical Instrument Digital Interface) files; (2) input MIDI files for the Synthesia application; (3) setting up the Synthesia application; (4) learning Angklung using the Synthesia application; and (5) evaluating the learning process. Research subjects were students who were members of the music community on campus, so that their age and musical abilities were very heterogeneous. The research subjects were 15 people, as many as one angklung player group. The results showed that angklung learning for students who had the low notation reading ability, became easier by using a touch of technology. Students can read, visual-based notation correctly. It can be concluded; that technology can provide the convenience in the process of learning music composition, especially in angklung music composition.

1. Introduction
Having the ability to read notation is needed in learning music [1-7]. However, the problem in angklung learning for the students in the pre-service elementary school teacher is their lack of ability in reading notation. Meanwhile, angklung learning really requires the skills of the learners to be able to read notation, because the composition of angklung music can be learned quickly by reading notation. There is a solution for the angklung learning process conducted by students who are weak in reading notation, involving the use of technology. One technology product that can be designed to be used in angklung learning of the condition of the learner cannot read notation is the Synthesia application.

There are various publications that explain the use of Synthesia. For example, Cremata and Powell [8] reported that four diverse media were studied concerning learning to sound like keyboard instruments on beginning grade musical assortments. Among these were Synthesia, eMedia, YouTube piano tutorials and standard Paper Notation. Results showed that Synthesia was more useful than the other three learning methods at allowing scholars to quickly mastering beginning grade songs. Villeneuve, Penhune and Lamontagne [9] use Synthesia and real music instruments to intervene in stroke sufferers. The results show that the piano exercise can effect insupportable developments in upper extremity function in chronic stroke stayers, both above studies, present Synthesia in the concept of music or single
composition. Meanwhile, using Synthesia in the concept of ensemble music has not been done. Therefore, this research is focused on the use of Synthesia on the type of ensemble music.

Referring to the research focus, the purpose of this study was to analyze angklung learning for students who were weak in reading notation, using the Synthesia application. Angklung is usually taught with number notation, but with the presence of technology today, it is necessary to try to teach with applications that highlight the visualization of the tone position, as Synthesia can do.

2. Methods
This research is carried out through the following stages: (1) making angklung musical composition in the type of MIDI files; (2) input MIDI files for the Synthesia application; (3) setting up the Synthesia application; (4) learning Angklung using the Synthesia application; and (5) evaluating the learning process. The research subjects were students of prospective elementary school teachers at one of the universities in the province of West Java, Indonesia. They are members of the music community, so angklung learning is done outside of college time, with an average of six hours of learning each week. Subjects numbered 15 people from various grade levels, so their age and even musical abilities were very heterogeneous.

3. Results and discussion

3.1. Making angklung musical composition in the type of MIDI files
MIDI files can be created using musical notation software, both free software such as MuseScore and paid software such as Sibelius. The researcher used the Sibelius software to create MIDI files. The way is to write the song's melody intact, save it in the type of a default file, and export it to MIDI files. Here is a Figure 1 that shows how to create a MIDI file in Sibelius.

![Figure 1. Create MIDI files in the Sibelius software.](image-url)
3.2. Input MIDI files for the Synthesia application

The Angklung composition that has been made into a MIDI file, then inputs into the Synthesia application. This facility for inputting MIDI files is only available in the paid version of Synthesia application. The free version of Synthesia can only play songs that are already stored in the application. The place to input or save MIDI files is located in the C directory of the computer / laptop in the music folder, as can be seen in Figure 2 below.

![Figure 2](image2.png)

**Figure 2.** The place to store MIDI files for the Synthesia application.

3.3. Setting up the Synthesia application

The initial display of the Synthesia application can be seen in Figure 3. Meanwhile, the basic settings needed for Synthesia applications are standard settings such as sounding like all tones, activating the paused button, and selecting the tone label (see Figure 4). For beginners, there is no need to change the default settings which are the default settings of the Synthesia application.

![Figure 3](image3.png)

**Figure 3.** Synthesia application.

![Figure 4](image4.png)

**Figure 4.** Synthesia features.
One of the settings that can be selected is the setting to choose the color tone that will appear based on each musical instrument. This can make learners more interested in playing musical instruments based on the colors they like. An example is Figure 5 below which shows a two-color settings (green and red) for the right hand (high tone / melody) and left hand (low tone / bass).

![Hands, Colors, and Instruments](image)

**Figure 5.** Choose colors in the Synthesia application

The results of selecting the two colors produce a display on the Synthesia application as shown in Figure 6. The left area (bass) is green, and the right area (melody) is red.

![Color displays when a song's melody is played](image)

**Figure 6.** Color displays when a song's melody is played

### 3.4. Learning Angklung using the Synthesia application

Learning is designed to be carried out in three stages, namely the stage of recognizing Synthesia, studying the angklung composition, and memorizing the angklung composition. The purpose of each stage can be seen in Figure 7 below.

![Stages and objectives of learning design](image)

**Figure 7.** Stages and objectives of learning design
3.4.1. **Recognize the Synthesia application.** At this stage, students were given an explanation that Synthesia is a video game and a piano keyboard mentor who permits employers to piece a MIDI keyboard or use a computer keyboard in time to a MIDI file by tracking on-shade instructions. Moreover, Synthesia can be matched with MIDI keyboards that have irradiated keys, or with simulated performer, piano on the shade, which some people trust makes learning piano calmer for learners [10]. For some people, Synthesia is a software program adapted for people with no music reading abilities [9]. Synthesia has a feature that allegedly can make it easier for students to play angklung. Students see researchers’ explanations about the features available in the Synthesia application. Students look easy to understand this, because the features can be tried directly or can be demonstrated. Thus, students can know for certain how Synthesia functions in the angklung learning process. The following is Figure 8 when students observe the Synthesia application.

![Figure 8. Students observe the Synthesia application](image)

3.4.2. **Study the parts of Angklung composition.** Here, students are given angklung in accordance with the tone they are interested in. They chose angklung based on the size of the angklung. Women prefer to use small angklung because they are not heavy when held. There are also students who choose angklung based on the number (number of) tones played. More experienced students prefer angklung that is sounded a lot. The composition of angklung that was studied by them was entitled “Merenung Pencipta.”

3.4.3. **Memorize the angklung composition.** Students look easier to learn angklung music arrangements by looking at Synthesia. However, during the performance, of course, they could not see the appearance of Synthesia. Therefore, there are times when students ring the angklung without seeing Synthesia. After they found it easy to read angklung scores through Synthesia, it turned out that one of the other challenges was the need to get used to breaking away from seeing Synthesia.

3.5. **Evaluating the learning process**

At this stage, the researcher evaluates the results of student learning, and students show the results of angklung learning using Synthesia application. These results are analyzed primarily in the development of the way students learn angklung, and also analyzed their ability to present angklung compositions. The results of the development of how to learn angklung can be seen in Table 1 below.
Table 1. The development of students in learning angklung.

| Assessment | Condition | Implications |
|------------|-----------|--------------|
| The speed of students to ring angklung according to the melody needed. | Students can easily read, visual-based notation. | The problem of reading notation has been solved with the Synthesia application. |
| Quality of angklung composition. | Some people still have errors in sounding angklung according to their rhythm. | It is necessary to select specifically for angklung players who often ring angklung with quite a lot of frequency. |
| | Almost all students rushed to ring the angklung. | It is necessary to practice angklung by using a metronome. |

It has been identified that angklung learning with the help of technology is easier. In other words, several characteristics of the learning progression are affected by the cognitively related appearances of media: their technologies, symbol systems, and processing proficiencies [11]. Music learning can develop with various touches of media and tools [12]. Synthesia becomes a solution in mediating students who cannot read notation to learn angklung composition easily. In principle, this method develops from learning by using the concept of Augmented Reality, as it allows a user to see the real world, with virtual objects superimposed upon or composed with the real-world [13, 14].

4. Conclusion

Angklung learning by using a touch of technology carried out in the music community has had a positive impact. Students who cannot read notation can play angklung compositions more easily by using Synthesia. Students can also learn music composition more quickly.

References

[1] Kopiez R and In Lee J 2008 Towards a general model of skills involved in sight reading music Music Education Research 10 41-62.
[2] Cappelletti M, Waley-cohen H, Butterworth B and Kopelman M 2000 A selective loss of the ability to read and to write music Neurocase 6 321-332.
[3] Picking R 1997 Reading music from screens vs paper Behaviour & Information Technology 16 72-78.
[4] Kopiez R and In Lee J 2006 Towards a dynamic model of skills involved in sight reading music Music Education Research 8 97-120.
[5] Jacobi B S 2012 Kodály, Literacy, and the Brain:Preparing Young Music Students to Read Pitch on the Staff General Music Today 25 11-18.
[6] Alexander M L and Henry M L 2015 The Effect of Pitch and Rhythm Difficulty on High School String Sight-Reading Performance String Research Journal 6 71-85.
[7] Joseph W 1965 Music Reading: When and How Music Educators Journal 51 66-68.
[8] Cremata R and Powell B 2016 Digitally mediated keyboard learning: Speed of mastery, level of retention and student perspectives Journal of Music, Technology & Education 9 145-159.
[9] Villeneuve M, Penhune V and Lamontagne A 2014 A Piano Training Program to Improve Manual Dexterity and Upper Extremity Function in Chronic Stroke Survivors Frontiers in Human Neuroscience 8 1-9.
[10] International O 2014 Synthesia (USA: Omicsgroup).
[11] Kozma R B 1991 Learning with Media Review of Educational Research 61 179-211.
[12] Scheid M 2014 Music education – privately, personally and professionally The school subject of Music, digital media and tools Education Inquiry 5 23255.
[13] Huang F, Zhou Y, Yu Y, Wang Z and Du S 2011 Piano ar: A markerless augmented reality based piano teaching system Intelligent Human-Machine Systems and Cybernetics (IHMSC) (China: IEEE) 2 47-52.
[14] Azuma R T 1997 A survey of augmented reality Presence: Teleoperators & Virtual Environments 6 355-385.