Song creation by using computer music notation

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Abstract. Creating songs by using intuitive method often faces deadlock because it requires high level of ideas and creativity. Through this research paper, the researchers have analyzed the alternative path of creativity in creating a song based on computer music notation. The application used is Sibelius 7 First software (hereinafter abbreviated Sibelius), which is also used as a method to create the songs. The researchers tested it by making a number of songs in a one month. The results showed that the process of creating songs using Sibelius was relatively fast because, within a month, it could create nine songs that were quite varied both in melody and rhythm. The melodies of the created songs were recorded directly in the computer, could be evaluated and modified directly according to the creator's wish, and could be heard directly without having to involve others to sing. When the songs were filled with vocals and tested for quality by being played directly to students, their responses showed a positive acceptance of the quality and aesthetics of the melody and the rhythm of the song. Thus, it can be concluded that the use of computer music notation could increase creativity in creating quality songs.

1. Introduction
Creativity in creating songs is a fundamental requirement for music educators since song learning is more appropriate if the material is tailored to the learners’ needs in every school. This is in accordance with the educational curriculum in Indonesia, which suggests students to be educated with songs that are contextual to their daily lives. As stated in the Core Skill (Kompetensi Inti) number 4 for Grade 2 students, sub point 4.7 states that in the end of the semester the students are expected to be able to sing simple children's songs using their own words that are meaningful [1]. However, many music educators have insufficient song materials, which make them use the same song every year, hence not being contextual. However, good and interesting song materials can actually be provided to solve such problems [2]. Therefore, the offered solution is to be creative in creating the song.

The process of creating songs nowadays can be done in various ways. In fact, the use of computers in the music industry has grown rapidly. The latest method in the field of music science is by integrating intuitive skills with technology through the use of computer music. Computer music is an integrated discipline of engineering systems combining information science and music science [3]. They are various software that can be used to create technology-based songs, including the music notation software. In its present development, music notation software (such as Finale and Sibelius) and web applications (such as Noteflight) are invaluable tools in this digital age [4]. Computer music production technology includes not only the digital processing of audio, but also MIDI production technology [3, 5, 6].
This research paper aims at describing and analyzing the use of computers as a device to create songs. The computerization process in song creation can serve as a solution for music educators who need songs with melodies and lyrics that fit their needs in teaching at various levels of education. This has been supported by computer music that has become a device that can make either the process of learning, analyzing, creating, and implementing the music easier [7, 8], especially for music educators who are highly motivated in acting and thinking creatively.

2. Methods
Computational method is the main method during the research process. Computation allows the creation of educational music tools [9-11], using Sibelius to create songs. There were two main activities in this research, including the process of composing the songs and testing their quality.

There were six steps taken as the basic skill in operating the Sibelius to develop song compositions, namely setting up a score, entering and editing notes, adding score expressions and articulations, adding text elements, setting basic score layout, and changing key and time signature [4].

The first step is setting up a score. In this step, the researchers set the documents’ layout, time signature, key signature, and score information. These initial settings represented the researchers’ ideas and desires in terms of the choice of instruments or the melodies. Figure 1 shows some initial settings to create a song in the Sibelius

The second step is entering and editing notes. By selecting the notes on the Keypad menu and writing them on the staff (lines and spaces), the melodic strings of the songs were assembled. The song structures and melodic contours could be developed instantly, tested by pressing the play button on the Transport menu, and changed or edited as desired. Figure 2 shows a staff that was ready to be filled with notes.

After that, the third step is adding score expressions and articulations. After the melodies were arranged and had clear song structures, score expressions were added through the application of sound dynamics. Figure 3 shows a song’s melody that has been complemented with expression element through the application of sound intensity with mp (mezzo piano) mark, which is moderately low volume of sound, and slur (perform legato) mark under the notes, which means that the sounds or words run into one another. In the Sibelius, adding an expression mark can be done through the Text menu on the top window. In addition, adding the slur mark can be done through the Notations menu on the top window as well.

The next step is adding text element. After the songs’ melodies were developed well and fitting the researchers’ preferences, the next step was to fill each note with lyrics. The themes were determined based on researchers’ choice. The first song created by the researchers was projected towards the direction of religious theme. Filling the notes with lyrics can be done through the Text menu. Figure 4 shows the notes that have been filled with religious-themed lyrics from a song piece.

Then, the next step is setting basic score layout. In this stage, all of the song creation processes were done. This was the step for printing-out and setting score layout purposes. For instance, the setting for the number of measures-per-system, distance between staves in a system, distance between systems, etc. [4]. In other words, if the standard layout has already been satisfying, then making any changes is not necessary.

Finally, the last step is changing key and time signature. Principally, the sixth step is identical with the fifth step; only taken when necessary. This step is the most useful when the songs are about to be tested to the students. If the key of a song is too low or too high, the key signature can be adjusted. The same thing applies to the melody where adjustments can be made in the time signature. This process can be done by right-clicking the mouse to bring out a menu box that consists of the settings for bar, key signature, time signature, etc.

Nine songs that have been created and filled with vocals and instruments were played for a class of 41 students in a university in Sumedang, West Java, Indonesia through an audio player on a laptop connected to a speaker. The songs were played three times and the students were instructed to listen carefully and were allowed to take notes on the songs. During each playback, the students were observed to attempt to follow the songs’ melodies and lyrics. After the playback of the nine songs, the students...
were instructed to fill out a survey through Google Form to give their subjective opinions. The following table is the survey results regarding the songs’ melodies and lyrics.

| Item Number | Questions                                           | Answer |
|-------------|-----------------------------------------------------|--------|
| 1           | Can you follow all the songs’ melodies?             | Yes: 23 No: 19 |
| 2           | Can you understand all the lyrics?                  | Yes: 33 No: 9  |
According to table 1, it was identified that 22 students (53.7%) could follow (imitate) the songs’ melodies, while 19 students (46.3%) could not follow the songs’ melodies. The songs’ melodies were followed by the students by singing or imitating them after listening to each song three times. It can be assumed that if they were given more time to listen to the songs more or even specially learn them, there would have been more students that could follow the melodies better. In terms of the lyrics, the majority of the students showed good understanding.

In the other section of the survey, the students were asked to rate their answers using Likert scale. From the following survey item, “Do all the songs have good quality to enjoy?” there were 5 students (12.2%) who stated rather agree, 21 students (51.2%) who stated agree, and 15 students (36.6%) who stated strongly agree. This data shows that the students’ opinions affirmed the fact that the songs had a good quality because only five of them stated rather agree, with their reasons not being investigated.

In the open-ended question section of the survey, the students were asked the following questions, “Which song do you find the most interesting? What are your reasons?” and from 41 students, 29 students (70.7%) chose the song entitled Merenung Pencipta (Contemplating the Creator), which was religion-themed; 6 students (14.6%) chose the song entitled Belajar Mandiri (Learning to be Independent), which was independence-themed; while the rest of them chose different songs with the average percentage under three percent. Their interest in a song theme showed their inseparability from their cultural education [12, 13] and religious background. This affirms that songs have been a major source of entertainment worldwide that transcends culture, race, and religion [14].

Furthermore, there were various reasons given by the students with a relatively short argumentation, for example “the lyrics are easy to remember and the melodies are catchy”. One of the students stated:

“First, the melodies and lyrics of the song entitled Merenung Pencipta was really good and gave me goosebumps—I can feel the song. And the second song [that I like is the one] entitled Bangun Toleransi (Build Tolerance) because of its vivacious melodies. Actually, all of the songs are good and have good meaning to build characters and motivation. I hope that the songs can be spread so that other people can hear them too.”

Through the questions above, it can be identified that the students with different musical skills had their own perspective in analyzing the songs. The activity of listening to songs with different-themed lyrics encouraged the students to learn and think based on their own personal context. This indicates that the songs had a socio-cultural perspective in terms of student engagement and also from a cognitive perspective as students were able to make connections in learning [15].

Therefore, the results of this research is in accordance with the others similar research that the use of music notation software can aid the creative processes of creating songs or music compositions and it can serve as an additional tool for music reading-writing in dictation tasks or even in elemental composition tasks [16]. The implication is that music educators still need more training to build their capacity in contemporary music and facilities to get the software through school development programs.

4. Conclusion
This research has drawn a conclusion that the use of music notation software can aid the music educators to create songs and can improve productivity in the creation of contextual songs. To operate the application is considered not difficult, therefore, the application can serve as an alternative for music educators who are interested to try making songs and teaching them to their students.

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