# A Research on the Design and Use of Colored Notes for Children in Music Education

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**Serkan Demirel**
*Gazi University, Turkey*
*https://orcid.org/0000-0003-3459-2836*

**Abstract**
*One of the essential tools of music education is the notation system. The musical notation system has evolved and attained its present form over many years. Learning the music notation system at an early age is an important step for the future of music education. For music education to start early, it may be helpful to adapt to music writing with colors without knowing how to read and write. This research aims to present a notation teaching method via colors to help music education. Although there have been some previous studies on colors and music, this research offers an approach for both using colors and removing them to adapt to today's notation system. It is an innovative study in this respect. After using the colors, it is aimed to avoid adaptation difficulties when switching to the prevalent notation system. The two stages were connected by first showing the notes with a diagram of colors and intervals and then coloring today's notation. The last stage aims to provide adaptation by removing the colors in the second stage. With the design obtained, three children's songs were applied in 3 steps and analyzed. Every stage of the research was carried out in the company of music education experts, and technical problems that may arise were tried to be prevented. As a result of the study, a teaching system has emerged that can facilitate the teaching of musical notation, especially for illiterate preschool children and educators who want to teach notation.*

**Keywords: Music Notation with Color, Colored Music, Colored Music Education, Colored Notation, Color and Music**

## Introduction

In the words of Confucius, music, which is the most significant factor in people's upbringing, historically dates back to ancient times. Education aims to develop behaviors in the desired way (Ertürk, 1984), while music education aims to gain these behaviors through music education (Uçan, 2018). The primary purpose in education is human education and its planned implementation. Education through music, an effective method in human education, is more than just gaining musical behaviors. Not only is it closely related to rhythmic, harmonic, and melodic aspects, making music can contribute to one's personal development (Biasutti & Concina, 2013). A study has revealed that music education has cognitive benefits and produces neurological benefits (Eugenia, 2015). Another study has proven that there is cognitive development in certain areas other than music with early music education (Bilhartz, Bruhn, & Olson, 2000). There are also studies showing that music improves reading skills in students with intellectual disabilities (Jacob & Pillay, 2021).

Educators have not ignored numerous benefits of music education, and new methods have been developed to make these benefits more effective. These methods generally focused on the childhood period, the beginning of human development in music education. In this sense, Dalcroze, Orff, Kodaly, and Suzuki are the leading music teaching methods. Dalcroze music teaching method, which is a method in which children learn music through rhythms (Hall, 1920), reveals, develops and improves innate musicality with rhythmic movement, ear training, and improvisation for music education (Dalcroze.org, 2022).

The method of placing the music that children hear on their bodies was applied in the first 10 minutes of the music lesson between 1987-1995 in Turkey (Çiçek, 2000). In Carl Orff's own words, Shamrock defined the movement of music as an idea to integrate speech and drama (Shamrock, 1986). The basis of the Orff method is a music teaching method consisting of rhythm and movements. Kodaly advocated that everyone should know music, based on the phrase "music is for everyone" (Boshkoff, 1991). Zoltan Kodaly argues that the real purpose of music education should be to encourage influential and talented music formation (Çiçek, 2000). The Kodaly method consists of musical notes, hearing training, singing, listening, and rhythmic movements (Howard, 1996).Suzuki's music teaching method, based on the pedagogical process of children's language development (Suzuki, 2012), has been adapted to many instruments, especially the violin. Suzuki, who saw that children learn difficult things for adults, adapted this method to music teaching (Çiçek, 2000).

Kodaly begins with singing, Orff with speech, Dalcroze with body movements (Music's Effect on Child Development, Educator's Perspectives: Comparing Kodály, Orff, and Dalcroze, 2022). On the other hand, the Suzuki method likened music education to language acquisition. Although there are differences between them, these methods, which are similar to each other, become more effective when the music educator decides which method to use and in what way according to the student.

Music notation is one of the most important tools of music education. It is the language of music. Music notation as a universal language is an art that was passed down from ear to ear before writing was invented. Music, which has had an important place as a communication tool for a long time, can present a similar way of expressing even people who do not know each other, with a universal notation system today.

Learning notation, which is the language of music, is among the basic stages of music teaching. Like language, it was spread by word of mouth among people before systematic writing emerged (Karolyi, 1999). Ancient Greek is considered the period when the scientific foundations of music writing and music theories began to form.Music writing, whose known foundations are based on Ancient Greek, is accepted as the period in which the foundations of scientific theories were created.

Roman philosopher Boethius was the first person to think of naming sounds (Mimaroğlu, 1990). After Boethius (480-524 AD) started to use the sounds in music with the letters A, B, C, D, E, F, G (Kaygısız, 1999), the transmission between generations in music started to become more organized. Boethius used a writing method that shows the descent and ascent of the melody, based on the Greek word "neuma," meaning "sign." Guido de Arezzo used the syllables he received from a hymn by transforming them into notes such as UT, RE, MI, FA, SOL, LA (Mimaroğlu, 1990).The staff, which was previously composed of four lines and used to write notes on it, took its current form by adding a fifth line in the 16th century (Kaygısız, 1999). Arezzo used colored lines similar to today's staff (Say, History of Music, 1997). With the use of sharps in the 17th century and the use of today's notation in the 19th century, the music notation system gained its present appearance (Kaygısız, 1999).

There are various methods used in music education. These methods increase the quality of education and increase its effectiveness. Music notation, an effective tool for memorizing, coding, storing, and retrieving music (Lee, 2013), is an important stage in music education. According to the modern education concept, a seven-year-old child can learn the notes in a few weeks (Say, 2001, p. 21). Nevertheless, notation teaching is a subject where teachers sometimes have problems due to the learning situations that vary from person to person. Therefore, many special teaching methods are applied to facilitate notation teaching. The basis of these teaching methods is the research on children. Several studies have been conducted on how children code musical notation.

Similarly, Barret (1997) and Lee (2013) had children listen to music and draw their musical note symbols. It was observed in both studies that children determined their systematic structure. Thus, it is foreseen that it will not be a problem to teach the theoretical structure of music to children in a simple system.

The success of using colors in education has been examined by Wilkins- has two separate studies- and Wilkins and Sihra (Wilkins, Sihra, & Myers, 2005), (Wilkins, 2005). The fact that music is a branch of art perceived by ear and colors are perceived by sight may actually lead to thinking of painting and music as two different arts. However, it is scientifically possible for an affective stimulus known as synesthesia to affect another effective stimulus (Buluttekin, Hevedanlı, & Yapıcı, 2020). The use of visual assistance in music is not a new concept. For example, Aristotle stated his thoughts on colors and sounds in his book (Poast et al., 2000). Rogers has done a lot of work on colors and music. The effect of the use of color-coded notation in teaching materials on some performances of students(Rogers, Effect of Color-Coded Notation on Music Achievement of Elementary Instrumental Students, 1991), and the effect of colored rhythmic notation on students' rhythm reading skills (Rogers, 1996) emphasized the importance of using colors in music education. Solis (2010) found that using color in music is effective in children with reading difficulties. Today, there are methods that use colors in music notation. One of them is "figurnotes" (Figure notes, 2022), and the other is the notation system proposed by Kuo and Chuang (Kuo & Chuang, 2013). The color hearing test developed by Karaelma and Demirel (2021) for the "musical hearing perception in children" test in Turkey and applied to the 9-12 age group is important research for the concept of music with colors.

The notation system, which is the language of music, is important for understanding music in all its fields. Just as learning the letters to speak a language is the first step of that language, learning the notes is the first step of learning music. Methods have been developed to teach this important step in the science of music education, and studies have been carried out on how this step can be more effective. The tendency of the researches has emerged in the form of directing people to music education by emphasizing the importance of music with the gains of music education and encouraging people in this regard. However, the main problem, the individual planning of education, has been ignored. In addition, it is seen in the studies on teaching notes with colors that although these are groundbreaking studies in the field, an important issue has been overlooked. Even though the aim is to teach notation, which is widely used today, research on teaching music notation with colors only examined the contribution of colors to teaching music notation, ignoring the problems that would arise when colors were removed.

Newton observed the colors that make up the visible spectrum, red, orange, yellow, green, blue, indigo, and violet, in his experiments with light passing through a prism (Smithsonian Libraries, 2022). The 7-color series, based on these colors, forms the basis of the musical notation system. Although teaching music with the help of colors is a useful method, the absence of colors can create a challenge for children since the main target music text is colorless. The results of the adaptation to the widely used notation system after the removal of colors in previous studies were not mentioned. Since it was considered that it would be difficult to adapt to the common notation system after the colors were removed, a 3-stage notation system was designed in this research, the final stage of which is the process of adapting to the widely used musical notation today. In the first stage, only the colors are shown with steps, and in the next stage, the notes are shown with colors. In the 3rd stage, the system taught in the basic stage aims to adapt to today's notation by removing the colors from the same song. Thus, it is thought that colors will contribute to musical notation learning. With this aspect, the research is fundamental both for music educators and for future research.

In the literature review section, a problem was determined to facilitate the teaching of notes, which is the missing aspect of teaching methods in music education. This problem has revealed the need to standardize a method that will form the basis of teaching the notation system used today for illiterate and pre-school children. The notation system used in the research has been created in such a way that it can be adapted to many instruments, especially the piano. Temporarily sticking the colors used in the first stage on the target instrument will be sufficient for this system to be used.

## Methods

This section contains information on how the

research was conducted. The research is descriptive research conducted qualitatively. According to Karasar (2005) Descriptive research is research that aims to obtain a description of the subject or activities of interest. The research falls into the descriptive research class as it includes the description of the use of colors in musical notation with sample songs.

The study design of the research is shown below;

- Literature review
- Defining the problem make the necessary design for the solution to the problem
- Expert opinion for the validity of the tool produced to solve the problem
- Arrangements after expert opinion
- Application of the music notation system to some children's songs
- Expert opinion for applied songs
- Conclusion of the research

The literature review was examined with studies on the notation system, and the ways of better teaching notation, which is one of the most important elements of educational education, were sought. A note design has been made inside for music when properly placed so that no music is made with colors. After the design phase was reviewed with the help of 3 academicians who are experts in the field of music education, three children's songs were arranged according to the notation system with colors. Therefore, the children's songs, which were adapted according to the teaching system with colors consisting of three different stages, were reviewed with the same experts, the conclusion of the research was started. Two of the experts are professors of music education, and the other is an associate professor of musicology. In addition, during the design of the notation system, the pre-school teacher was assisted at every stage.

Since the subject of the research is music with colors, which is a facilitating aspect in music education, an instrument was designed to be a color notation system. The developed tool was applied to sample songs, and the songs were evaluated in the 3-stage teaching system.

The design is suitable for the subject of the research. In case of repetition of the research, sufficient information is available. The procedures followed are sufficient to define the trial. For all those reasons, it has the feature of leading to future research.

**Findings**

In this part of the research, firstly, the introduction of the designed notation system, and then the adaptation of three known children's songs to the designed system is shown.

**Findings on the Design of the Notation System**

There are three stages in the notation teaching system of the research.

- Only colors and range stage
- The colors are shown together with the musical notes
- The colors shown in the previous stages are removed

In the research, the notation system used is as limited as the intervals on the piano keyboard shown below. The pitch, which consists of notes C-E (interval 10), is shown below.

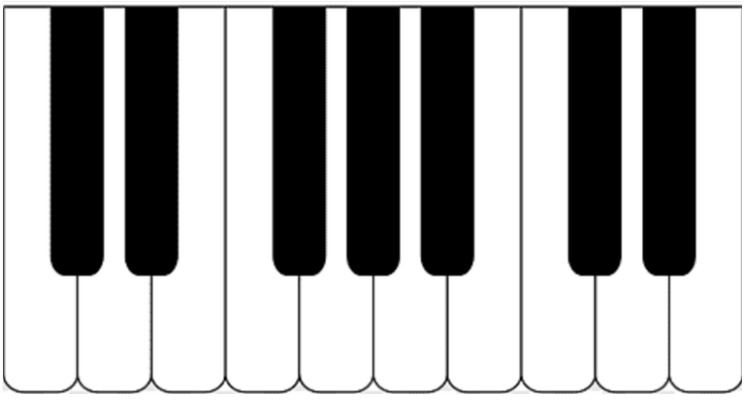

**Figure 1 Piano Keyboard**

In order to help the teaching of musical notes, the natural notes in C major, which are white on the piano keyboard, are used.

**First Stage Design, Only Colors, and range**

The main point and the most important point of the research, the first part C, D, E, F, G, A, B, C, D, E notes are in the form of steps, paired with a sequential seven colors in its color.

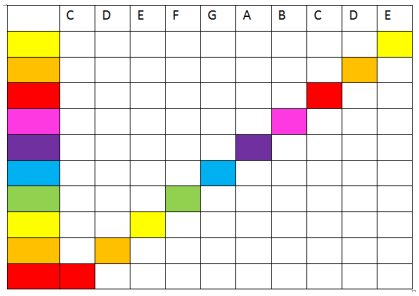


**Figure 2 Music Notes Palette of 7 Sequential Colors**

The colors in the diagram above are used instead of the notes in the first stage. With a system in which both colors and intervals are displayed, it is planned to teach sound pitches and intervals easily. The rows of the color palette are created according to the color hierarchy in the rainbow. With the use of the steps, it is easy to switch to the colors and notes used in the next stage.

After this palette, the notes on the piano keyboard are seen as follows After this palette, the notes on the piano keyboard are shown in the figure below. Thus, this system can be transferred to many instruments, especially the piano.

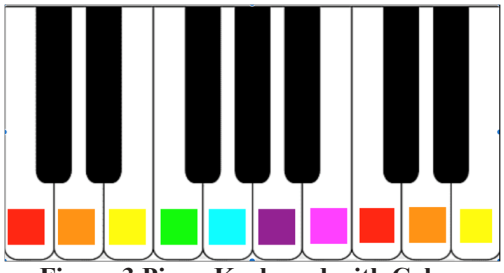

**Figure 3 Piano Keyboard with Colors**

This system can be transferred to many instruments, especially the piano. The screenshot of the audio and video prepared to help this system can be seen below.

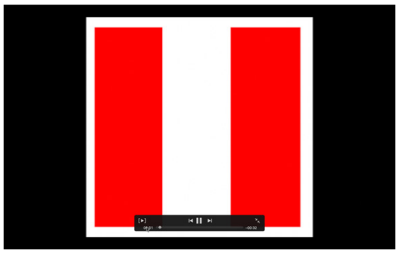

**Figure 4 Two C Notes Screenshot of Video and Sound**

The table above shows an example of the screenshot given in the color-enhanced video while playing music. The image on the screen represents the notes C C. The image on the screen should change with each note. Thus, the note corresponding to the playing note should be displayed on the screen. The videos shown on the screen can be used in the next step.

**Second Step Design, the Colors are Shown Together with the Musical Notes**

At this stage, it is aimed for the student, who was taught interval knowledge by using the colors used in the previous stage, to make an easy transition to today's notation. This section is different from today's notation using commonly; the inside of the notes are designed in a colorful way.

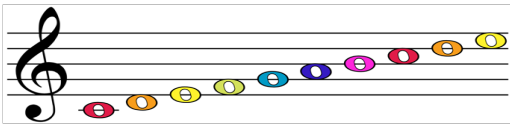

**Figure 5 Notes with Colors**

Above are the colors designed in the previous stage with a range of notes C, D, E, F, G, A, B, C, D, E. It is appropriate to use the video (figure 4) used in the previous stepin this section as well.

**Third Stage Design, Removing the Colors**

The third stage, which is the main target of the music education system, consists of the notation system that is widely used today. Until this stage, the notation, which was shown with only colors, notes, and colors, is shown in its traditional form. Below is the representation of the notes used in color in the previous stages in the traditional notation system.

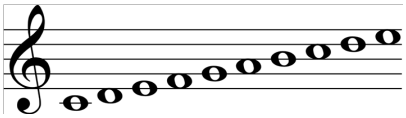

**Figure 6 Notes without color**

The issue of removing colors, which music education systems ignore with colors, has been taken into consideration in the research.

**Findings on the use of the Notation System**

The findings regarding the use of children's songs, Twinkle Twinkle Little Star, Old McDonald, Yankee Doodle, are designed which were designed in the first section, are shown below.

**Twinkle Twinkle Little Star, First step**

**Figure 7 Twinkle Twinkle Little Star Range**

The above figure shows the notes of C C G G A A G F F E E D D C. These notes form the first sentence of the children's song Twinkle twinkle little star.

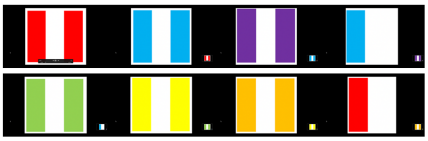

**Figure 8 Twinkle Twinkle Little Star Video Screenshot**

Screenshot of the video of the notesC C G G A A G F F E E D D Cshown in the previous figure is seen above. This video can be used in the next stage as well.

**Twinkle Twinkle Little Star, Second Step**

The use of the song twinkle twinkle little star in the second stage is shown above. At this stage, the video (figure 8) used in the first stage can be used as well.

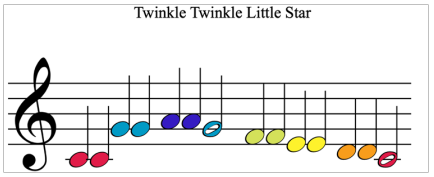


**Figure 9 Twinkle Twinkle Little Star Notes with Colors**

**Twinkle Twinkle Little Star, Third step**

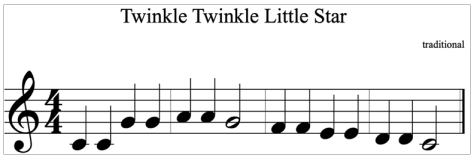


**Figure 10 Twinkle Twinkle Little Star Notes without Colors**

Above is the song Twinkle twinkle little star after the colors have been removed. The implementation of this stage is important in terms of teaching the notation system. If colors are used only in the first two stages, the situation when the colors are removed can be problematic.

**OldMc Donald, First Step**

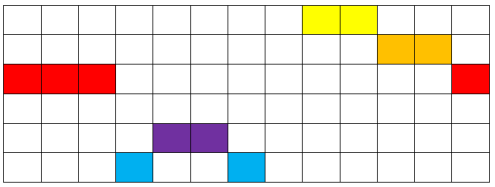

**Figure 11 Old Mc Donald Range**

The above figure shows the notes of C C C G A A G E E D D C. These notes form the first sentence of the children's song Old Mc Donald.

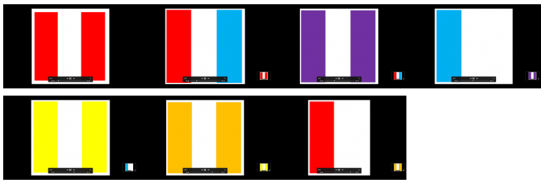

**Figure 12 Old Mc Donald Video Screenshot**

Screenshot of the video of the notesC C C G A A G E E D D Cshown in the previous figure is seen above. This video can be used in the next stage as well.

**OldMc Donald, Second Step**

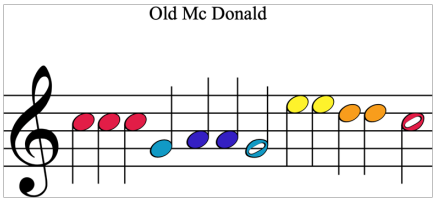


**Figure 13 Old Mc Donald Notes with Colors**

The use of the song Old Mc Donald in the second stage is shown above. At this stage, the video (figure 12) used in the first stage can be used as well.

**Old Mc Donald, Third Step**

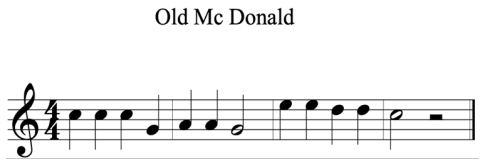


**Figure 14 Figure 13 Old Mc Donald Notes without Colors**

Above is the song Old Mc Donald after the colors have been removed. The implementation of this stage is important in terms of teaching the notation system.

**Yankee Doodle, First Step**

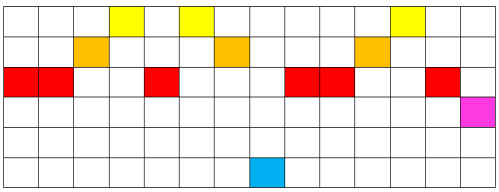

**Figure 15 Yankee Doodle Range**

The above figure shows the notes of C C D E C E D G C C D E C B. These notes form the first sentence of the children's song Yankee Doodle.

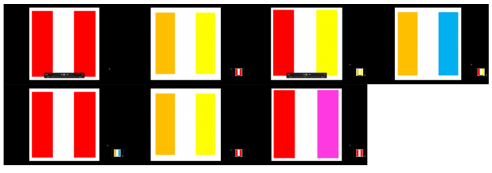

**Figure 16 Yankee Doodle Video Screenshot**

Screenshot of the video of the notes C C D E C E D G C C D E C B shown in the previous figure is seen above. This video can be used in the next stage as well.

**Yankee Doodle, Second Step**

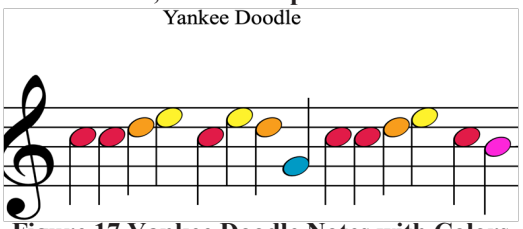


**Figure 17 Yankee Doodle Notes with Colors**

The use of the song Yankee Doodle in the second stage is shown above. At this stage, the video (figure 16) used in the first stage can be used as well.

**Yankee Doodle, Third Step**

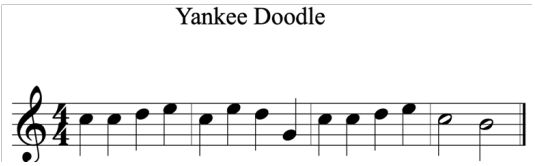


**Figure 18 Yankee Doodle Notes without Colors**

Above is the song Yankee Doodle after the colors have been removed. The implementation of this stage is important in terms of teaching the notation system.

**Discussion and Conclusion**

In music, note writing is the two most important elements, together with recording technologies, for the transfer of music. Learning notation, which is an important step, especially for music education, is a common feature for those who speak the same language, that is, for those who speak the language of music, after learning it because it is the language of music. For this reason, learning musical notation, which is the writing of music, is an important initial step in music education.

Color notes are an important teaching method in the methods developed for teaching musical notes. However, due to the absence of colors in the widely used notation system, the adaptation problem that occurs after the colors are removed in the

notation system taught with colors is an important problem that may arise. This problem was taken into consideration in the research, and the stages of notation system design were adjusted accordingly.
In the research, examinations were made about the music teaching program with the colors created for easier learning of musical notation. The three stages in the program were evaluated with 3 sample children's songs, and examples were examined for their usability.

The first stage is the basic stage and is a suitable initiation stage, especially for illiterate and pre-school children. At this stage, seven colors are shown with the help of steps by matching seven diatonic notes. At this stage, there are no notes, only steps, and colors. The purpose of this is to grasp the heights of the notes with the help of colors only. In addition, the sound recording to be played with the video editing program is given with the note colors used at this stage, and it is aimed to match the sound and the image. Three well-known children's songs such as Twinkle Twinkle Little Star, Old Mc Donald, Yankee Doodle are shown with colors and steps at this stage. As a result of the research, it is considered that this section is especially suitable for illiterate and pre-school children.

The second stage is both a beginning in itself and a continuation of Stage 1. It is a beginning in itself because; It is designed in such a way that children with faster perception can start directly from this stage and move on to the next stage. It is the continuation of Phase 1 because; It will be a correct method for both illiterate and children to understand the system established with colors better and move on to this stage. As can be seen, this system proposed in the study is suitable for student-centered use. In other words, to whom this system will be applied, the teacher should decide according to the situation of the student and should apply the teaching of notes with colors.

For the second stage usage analysis, the colors and steps given in the first stage are shown with the colors and notes created by the coloring of today's note system. The introductory parts of the songs Twinkle Twinkle Little Star, Old McDonald, Yankee Doodle are illustrated with today's notation coloring. The colors are the same as in the first part, but this time, stave and notes are also included in the work. The videos used in the first part can also be used here. It has been concluded that the colors suggested in the research and the 2nd part of the note system have the feature of being both a beginning and a part of the system. It is recommended to teach this system for both pre-school teachers and music teachers.

The third stage is the last link of this system and contains the main goal to be achieved. In this section, it is planned to teach the widely used notation system by removing the colors used in the previous two stages. The introductory parts of the songs Twinkle Twinkle Little Star, Old McDonald, Yankee Doodle are shown with their notes. The presence of this stage in the research is both to prevent students from sticking to colors only and to show the instructor the target position of the curriculum with colors.

In many previous studies, notation systems related to the use of colors were designed. While some take colors from color groups that are very far from each other, others have designed a method for the use of colors only. The strength of the research is that the teaching of notes with colors is designed to consist of 3 stages. While the strength of the music education programs made with colors is to ensure that the notes are taught more easily, the weakness is seen as the fact that the students need to learn by adding the color variable to the notation system that is intended to be taught. In other words, there are no colors in commonly used music writing. Therefore, students may find it difficult to discard the colors they learned at first. However, if a system consisting of stages, as suggested in the research, is included in music education, the colors can be disabled when desired, and notation teaching can be realized at the intended level. With this aspect, the research took the strengths of other researches and eliminated the weaknesses.

Music writing is an important element for music. This system used in the research should be included in music education. But in order for it to happen, the infrastructure must first be prepared. Music education with colors must be included in teacher education. In addition, it is recommended to carry out studies on musical hearing by using this system.

**References**

Barret, Margaret. "Invented Notations: A View of Young Children's Musical Thinking." *Research Studies in Music Education*, vol. 8, no. 1, 1997, pp. 2-14.

Biasutti, Michele, and Eleonora Concina. "Music Education and Transfer of Learning." *Music: Social Impacts, Health Benefits, and Perspectives*, edited by Simon, Peti, and Tamas Szabo, Nova, 2013.

Bilhartz, T.D., et al. "The Effect of Early Music Training on Child Cognitive Development." *Journal of Applied Developmental Psychology*, vol. 20, no. 4, 2000, pp. 615-36.

Boshkoff, Ruth. "Lesson Planning the Kodály Way." *Music Educators Journal*, vol. 78, no. 2, 1991, pp. 30-34.

Buluttekin, Özlem, et al. "What is Synesthesia? Biological Dimension, Relationship with Autism and Education." *International Pegem Conference on Education*, 2020, pp. 9-18.

Çiçek, Sebahattin. *Music Teaching in Primary Education*. Ezgi Library, 2000.

"What is Dalcroze?" *Dalcroze.org*, https://dalcrozeusa.org/about-dalcroze/what-is-dalcroze

Ertürk, Selahattin. *Curriculum Development in Education*. Yelkentepe Publishers, 1984.

Eugenia, Costa-Giomi. "The Long-Term Effects of Childhood Music Instruction on Intelligence and General Cognitive Abilities." *Update: Applications of Research in Music Education*, vol. 33, no. 2, 2015, pp. 20-26.

"What is Figurenotes?." *Figurenotes*, https://figurenotes.org/what-is-figurenotes

Hall, Lucy Duncan. "Dalcroze Eurythmics." *Francis W. Parker School Studies in Education*, vol. 6, 1920, pp. 141-50.

Howard, Priscilla M. "Kodaly Strategies for Instrumental Teachers." *Music Educators Journal*, vol. 82, no. 5, 1996, pp. 27-33.

Jacob, Udeme Samuel, and Jace Pillay. "Effectiveness of Music Therapy on Reading Skills of Pupils with Intellectual Disability." *Cypriot Journal of Educational Science*, vol. 16, no. 1, 2021, pp. 251-65.

Karaelma, Baris, and Serkan Demirel. "Scale Development for Children's Musical Hearing Perception." *Journal of World of Turks*, vol. 13, no. 1, 2021, pp. 293-311.

Karasar, Niyazi. *Scientific Research Method*. Nobel Publishers, 2005.

Karolyi, Otto. *Introduction to Music*, translated by Mehmet Nemutlu, Pan Publishing, 1999.

Kaygısız, Mehmet. *The Evolution of Music from the Beginning of Music History to the Present.* Category Publishing, 1999.

Kuo, Yi-Ting, and Ming-Chuen Chuang. "A Proposal of a Color Music Notation System on a Single Melody for Music Beginners." *International Journal of Music Education*, vol. 31, no. 4, 2013, pp. 394-412.

Lee, Pyng-Na. "Self-Invented Notation Systems Created by Young Children." *Music Education Research*, vol. 15, no. 4, 2013, pp. 392-405.

"Educator's Perspectives: Comparing Kodály, Orff, and Dalcroze." *Music's Effect on Child Development*, 2012.

Mimaroğlu, İlhan. *Music History*. Asset Publications, 1990.

Poast, Michael, et al. "Color Music: Visual Color Notation for Musical Expression." *Leonardo*, vol. 33, no. 3, 2000, pp. 215-21.

Rogers, George L. "Effect of Colored Rhythmic Notation on Music-Reading Skills of Elementary Students." *Journal of Research in Music Education*, vol. 44, no. 1, 1996, pp. 15-25.

Rogers, George L. "Effect of Color-Coded Notation on Music Achievement of Elementary Instrumental Students." *Journal of Research in Music Education*, vol. 39, no. 1, 1991, pp. 64-73.

Say, Ahmet. *Music History*. Music Encyclopedia, 1997.

Say, Ahmet. *The Book of Music*. Music Encyclopedia, 2001.

"The Science of Color." *Smithsonian Libraries*, https://library.si.edu/exhibition/color-in-a-new-light/science

Shamrock, Mary. "Orff-Schulwerk an Integrated Foundation." *Music Educators Journal*, vol. 72, no. 6, 1986, pp. 51-55.

Solis, Madonna A. *The Effects of Colored Paper on*

*Musical Notation Reading on Music Students with Dyslexia*. Texas Tech University, 2010.

*Suzuki Violin School 1-Collectivw*. Porte Music Education Center, 2012.

Uçan, Ali. *Music Education: Basic Concepts - Principles - Approaches and Situation in Turkey*. Friend Publications, 2018.

Wilkins, Arnold J., et al. "Increasing Reading Speed by using Colors: Issues Concerning Reliability and Specificity." *Perception,* vol. 34, no. 1, 2005, pp. 109-20.

Wilkins, Arnold. "Colored Overlays and their Effects on Reading Speed: A Review." *Ophthalmic and Physiological Optics*, vol. 22, no. 5, 2005.

**Author Details**

**Serkan Demirel,** *Gazi University, Turkey,* ***Email ID****: sekole@gmail.com*