

RESEARCH ARTICLE

A Study on the Music-Based Ecological Environment Convergence Class Using Children's Songs: Focusing on Elementary School Learners

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Abstract

The purpose of this study is to devise a music-based ecological environment convergence class plan using children's songs. As the global environment is rapidly destroyed, the world is paying a lot of attention to ecological environment education. However, if it is carried out within the music subject, it is necessary to study this in that 1) the nature of the subject content and whether both categories of ecological environment education can be effectively dealt with, and 2) the rather heavy concerns of preparing sanctions suitable for ecological environment education and establishing teaching and learning method design return to the responsibility of instructors. Therefore, this study prepared an effective teaching and learning plan for elementary school learners based on hermeneutic research methodology, focusing on the aspects of 'convergence education' and 'selection of appropriate sanctions and Utilizing'. To this end, based on the music-based ecological environment teaching and learning model (Lee, 2024), a systematic and colorful teaching plan was proposed by applying the ecological environmental fluctuations previously developed for this study. The conclusion of the study is as follows. First of all, we developed this study 'A Study Model for Music-Based Ecological Convergence Education'. In order to conduct more effective classes using Environment Convergence Education, it is necessary to understand the meaning and characteristics of each step of the model and prepare teaching and learning methods and materials that can be applied immediately to one's music class after sufficient review. Second, appropriate children's songs are indispensable for music-based convergence classes in the ecological environment. Third, it is possible to raise awareness about protecting and maintaining the global environment through music-based convergence classes in the ecological environment. It may be a good idea to increase the longing for natural sounds through learning activities related to soundscape. Forth, in music-based ecological environment education, it is possible to teach and learn by using all elements of music utilized in all forms. Fourth, while conducting music-based environmental convergence classes, the natural characteristics of the music subject should not be compromised. Finally, through music-based ecological environment education, not only vocational information related to music but also vocational information related to the ecological environment can be provided.

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I. Introduction

1. Necessity and purpose of research

“We are convinced that urgent action is needed to address the dramatic interrelated challenges the world is facing, in particular, the climate crisis, mass loss of biodiversity, pollution, pandemic diseases, extreme poverty and inequalities, violent conflicts, and other environmental, social and economic crises that endanger life on our planet. We believe that the urgency of these challenges, exacerbated by the Covid-19 pandemic, requires a fundamental transformation that sets us on the path of sustainable development based on more just, inclusive, caring and peaceful relationships with each other and with nature (Unesco, 2021).”

The above is the second content of the Berlin Declaration derived

from the 2021 UNESCO ESD World Congress, and it can be said that it is easy to see how important ecological environmental education is being treated as an agenda. The international community never considers environmental destruction around the world a light issue, and this is well proven in the way environmental education takes place. Regarding school environmental education, according to the 2016 International Civics and Citizenship Education Study (ICCS), topics on environmental and environmental sustainability were generally included in the 8th grade curriculum (OECD, 2018:147; Jeong Seok-hyun, 2023). Such education is applicable to most of the subject content and is also applied and practiced in music subjects.

In particular, music education in Korea has been deeply aware of these important agendas of the international community and has been conducting environmental education within the music subject from a leading standpoint. However, it is not that easy to educate by linking the two themes of 'music' and 'environment'. The reason is 1) concerns that the nature of each school system may be diluted while teaching and learning two interdisciplinary systems of different characteristics within one unit class, and 2) it is difficult to secure sanctions suitable for ecological and environmental education. Therefore, in this study, an educational plan is established to find a way to overcome both of these challenges.

In general, convergence education refers to so-called 'applied education' that combines not only a single interdisciplinary knowledge but two or more interdisciplinary systems so that they can become more closely related to real society in the

present era (Hyun-cheol Choi, 2019). This is not a physical bond, but a chemical bond, and it would be appropriate to compare it to the formula 'A+B=C (something new)'. Therefore, when convergence education is conducted in the educational field, a rational and logical teaching and learning method that enables 'something meaningful' to be derived is needed. In that sense, even in the context of education by linking music and the ecological environment, appropriate teaching and learning methods that can utilize each characteristic are needed, and this study intends to prepare a teaching strategy based on the 'Music-based Ecological Environment Class Model (Lee, 2024).

If the content discussed in the above paragraph is a methodological foundation that corresponds to a large framework of the class, a specific educational strategy is needed. For example, it is a content corresponding to what kind of children's song will be used and how to lead the song to effective ecological environment education. It will not be somewhat easy to find an appropriate educational sanction song related to ecological environment education. Therefore, it is sometimes a good way for instructors to create songs that suit their students' level and interests. Furthermore, by using various music composed by oneself-for example, changing lyrics, including sounds that imitate nature, expressing the body, and producing concert-like results-the content of the class can be devised. In other words, in this study, various measures will be specifically sacrificed so that the flow of music class described above can be viewed as a blueprint.

In summary, it is to devise a music-based ecological environment convergence class plan using the children's songs of this study. It is hoped that through this study, effective ecological environmental education will be achieved within the music subject and serve as a good example for the practice of 'sustainable education' proposed by the international community.

2. Research Method

The method of this study was conducted based on an analytical research method. The interpretive research methodology refers to a method of deeply interpreting and understanding the human subjective motives or objectives contained in social phenomena. The purpose of this study is to understand and describe social phenomena in depth, and this study reflected issues in various parts of the world where environmental destruction is accelerating. The strategies of various teaching and learning tools and measures that enable ecological environmental education to be carried out in the field of elementary music education in Korea were described and presented from an interpretive perspective.

II. Theoretical background

1. Understanding Music-Based Convergence Education¹

1. Convergence-based music class

Music activity refers to the act of expressing music by sound and understanding music by listening to music. In other words, it is to feel the beauty of music and understand its musical characteristics and historical, cultural, and social values or significance (Jongmo Yang, 2018, 10). People also express and communicate in words and writings about

the music they enjoy. Music has already been studied and explained in connection with a wide variety of academic fields. This fact means that music already has a convergent relationship with various fields. Music is very easy to approach convergence with other subjects including science, society, and mathematics as well as art fields such as literature, art, and dance. Convergence is a way of thinking in which knowledge related to the humanities, sociology, and natural sciences meet each other to create new knowledge, and it is not simply convergence to connect different knowledge and increase the amount (Jeong Hee-jin, 2020). Convergence music classes have true meaning in exploring and realizing the relationship between music and various surrounding phenomena.

The 2022 revised music curriculum emphasizes the relevance of other art areas and other subjects centered on music (Ministry of Education, 2022). As suggested in the curriculum, it is very meaningful to discover the unique characteristics of music in the process of linking music with other arts. Furthermore, it is different from music Developing an eye for looking at music from a new perspective from the perspective of humanities, society, and natural sciences through connection with the subject can not only develop musical literacy, but also increase the learning effect of related subjects (Ji Min-ju 2019). Through the act of expressing and listening to music, music and related to music can be improved Creating new knowledge by thinking about various contexts is a major function of convergent music classes.

2. Principles of Applying Convergence in Music Classes

The following principles apply to the design of fusion music classes. First, it is designed around the music subject. The characteristics of the music subject may be lost by placing the center of gravity in content other than music. Learners not only effectively learn the core contents of the music subject by thinking about music in various creative ways, but also learn about other subjects and other art genres

You will also be able to increase your understanding.

Second, use interesting learning content. When the content used in the convergent music class is an element that can attract students' interest and interest, students' participation in learning can increase and creative thinking can be promoted.

Third, use learning contents that can derive various results. The goal of convergent music classes is to derive new learning results by

linking with other learning contents and making creative thinking based on the learned music knowledge and experience. Rather than flowing the flow of thinking in one direction, it is to draw new learning results in various directions

In order to enable diffuse thinking, it should be designed to explore various possibilities by predicting the expected learning outcomes at the level of students at the design stage of the class.

Fourth, consider the level between convergence elements. The level of students who want to apply the level of other subjects or other art areas that make up the convergence class, such as adjusting the hierarchy between subjects by grade group during the curriculum, increases academic achievement and leads to creative results You'll be able to pull it out.

2. Understanding of Ecological Environmental Education

Throughout the past 35 years, much of environmental education has focused on how humans negatively impact their environment, and has implied that humans are separate from rather than part of nature and ecosystem processes (Keith G. Tidball & Marianne E. Krasny, 2011). Korea's Ministry of Education is focusing on supporting school sites to recognize environmental problems and climate crises from an early age and to foster global ecological citizens who actively cope with, act, and practice in their daily lives. In particular, the Korean Ministry of Education's school environment education will be promoted in three directions: Δ guaranteeing environmental learning rights for a sustainable society Δ establishing a school environmental education center for the transition to a carbon-neutral society Δ innovating the implementation system to respond to the new climate system (happy edu, 2021). This is not limited to the Korean education system, but a global issue, and the figure that relates the sustainable development goals (SDGs) set by the United Nations to convergence education (STEM) is shown in Figure 1. Here, many factors related to the ecological environment can be seen, and interest in the international community in ecological environment education can be examined. Furthermore When the conventional STEM is added with arts, it is commonly known as STEAM. One of the best things about STEAM is that it enables students to discover the artists within them. Take, for instance, creating seed necklaces or building the same bridge with ice-cream sticks are not only just science-based but also promote artistic expressions among children. This fact can be said to bring a lot of meaning to this study.

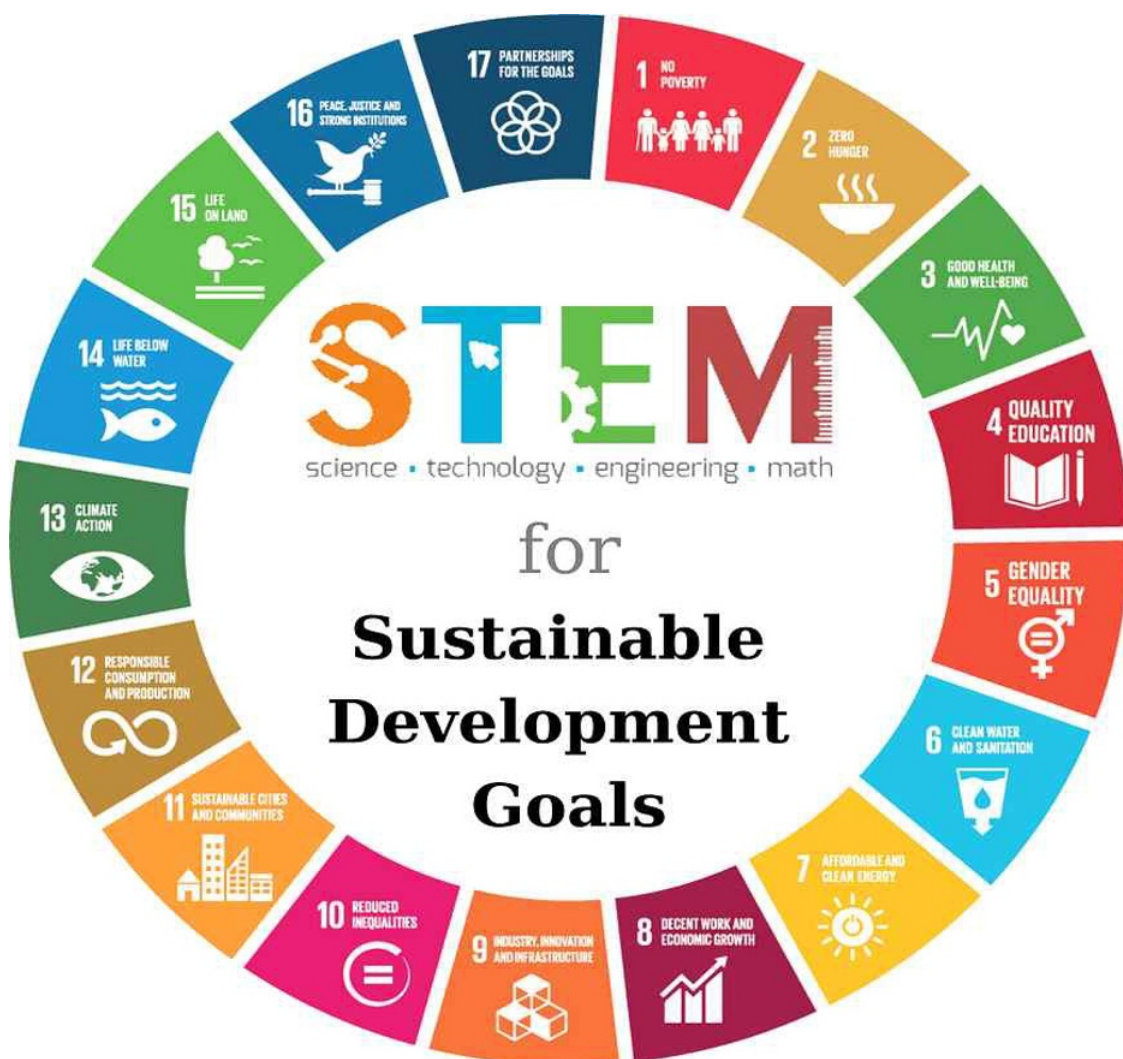


Figure 1. STEM Education for Sustainable Development Goals (Hundred, 2018)* <https://hundred.org/de/innovations/stem-education-for-sustainable-development-goals>

3. Understanding 'Music-based Ecological Environment Class Model(MbEEC model) (Lee, 2024)'

The Music-based Ecological Environment Class Model is an educational program model developed by researcher Lee in April 2024. This is an effective basis for conducting a music-based ecological environment education program, and it is a model devised by integrating Leonardo da Vinci's creative fusion thinking organized by Michael J. Gelb and the 13 tools of thinking by the Root Bernstein couple. In this study, the possibility of convergence between music subject and ecological environment education was explored through this program model, and in this study, the procedure and content of this program are applied as an important basis. The overall overview is shown in Table 1.

No.	Da Vinci's Principles of Thought	Principles of Convergence Music Classes Based on Da Vinci Thought Principles (Lee et al., 2021)		No.	Root Bernstein's Theory 'Thinking Tool'	13 tools of thought reconstructed for convergence education in the field of culture and arts (Lee, 2022)		No.	Music-based Ecological Environmental Education Program
1.	Curiosity	a curiosity about music	+	1.	Observation	sensory observation		a.	Interest in music and the environment
2.	The spirit of experimentation	the use of music		2.	embodiment	the embodiment of the senses		b.	Looking for ways to protect the ecosystem using music
3.	Sense	a musical sense		4.	Pattern recognition	Structuralization		c.	To be sensitive to the ecological
4.	Embracing Uncertainty	an inclusiveness to a variety of musical subjects			Pattern formation	Create a new structure			
					An analogy	Search for Relativity			
				6.	Thinking	embodiment			

				with your body		environment through musical elements
5.	Art and science	a wide range of thoughts centered on music	3.	Empathy	Empathy	d. Making music out of nature
6.	Physical character	the expressive power of music	5.	Dimensional thinking	Reconfiguration through perspective	e. Symbolizing Music and Nature in New Dimensions
				Model making	symbolization	
7.	Connection relationship	Exploring musical relevance	7.	Play	liberalization	f. Enjoying music freely in nature
			8.	Transformation	Metapattern	g. Use your body to express music in nature and nature in
				Integration	Convergence	
						music
						h. Combining music with nature and digital media

Table 1. ‘The process of deriving the theme of ‘Music based Ecological Environment Class (MbEEC)’ (Model)
**In this model, color plays an important function.*

III. A Study on the Method of Convergence Education for Ecological Environment Based on Music

1. A Study Model for Music-Based Ecological Environment Convergence Education

No	Music-based Ecological Environmental Education Program	The Level Interpretation of Program Process	special Characteristic by step
a.	Interest in music and the environment	Find sounds that can be heard in nature, such as the sound of birds, breezes, and grassworms, and look at the elements of sounds that are considered music.	Introduction – Observation about nature sound
b.	Looking for ways to protect the ecosystem using music	We investigate various spaces on Earth where the ecological environment has been destroyed and look for necessary musical treatments. For example, it can play cold and cool music for polar bears who are struggling because the temperature continues to rise, or it plays music that resembles clear air for trees dying of fine dust.	Playing music to the natural environment I (Walking and playing singing and instrumental music directly)
c.	To be sensitive to the ecological environment through musical	Enjoy music depicting nature, such as spring, summer, autumn, winter, flowers, snow, rain, and	Playing music to the natural environment II (listening to

	elements	wind, and sympathize with each natural element and ecological environment more.	music with nature through audio)
d.	Making music out of nature	It actually 'musicizes' natural sounds that resemble music. Various activities such as melody, rhythm, harmony, and lyrics are possible.	Nature from my point of view I: Making sound effects with natural sounds
e.	Symbolizing Music and Nature in New Dimensions	Express music and nature with 'poetry' or 'art'. Objects of expression include both music and nature.	Nature from my point of view II: Changing the Lyrics of Sanjeok
f.	Enjoying music freely in nature	Play, appreciate, or create music in a place where nature unfolds. This activity is an activity that is not 'foundational' at all, and can be said to be improvisation, appreciation of desired music, and free creation.	Nature, Music and Me: Free time with nature that comprehensively utilizes singing instrumental appreciation creative activities
g.			
h.	Use your body to express music in nature and nature in music	A short melody is created and sung spontaneously, and this melody is expressed with leaves, stones, soil, water, etc. And the various climates in natural ecosystems are expressed through music.	Dedicating the melody to nature and expressing it back to nature (using e.g., body expression)
	Combining music with nature and digital media	It integrates music and nature in a digital situation where there is	Nature and music in the video:

Table 2. The Class Model “Music-Based Ecological Environment Convergence Education”

2. A step-by-step strategy of the class model

1. Interest in music and the environment

Teaching and learning example:

- **Activities:** Provide presentations that introduce students to the relationship between environmental issues and music. For example, you can introduce famous music projects or campaigns for conservation (e.g., "Earth Song" by Michael Jackson).
- **Discussion:** Discuss environmental issues and the role of music with students, and share ideas about how music can contribute to environmental protection.
- **Work:** Try writing a simple musical idea that expresses your interest in the environment. For example, you can conduct activities to create short melodies or lyrics that are themed around environmental issues.

2. Finding ways to protect the ecosystem using music

Teaching and learning example:

- **Activity:** Research music projects to protect the ecosystem, and research how students can use music to address environmental issues.
- **Workshop:** Working with local environmental organizations, we can hold workshops to learn how to express their work musically.
- **Work:** Let students suggest ways to protect the ecosystem through musical ideas, and express the ideas in songs.

3. Sensitive to the ecological environment through factors

Teaching and learning example:

- **Activity:** Listen to various sounds of nature (e.g., wind, rain, birdsong, etc.) and conduct activities to explore how they react emotionally.
- **Experiment:** Record or directly compare sounds from nature to sounds or instruments, experiment with how each sound can express a sensitive response to the ecological environment.
- **Work:** Analyze musical elements (rhythm, melody, harmony, etc.) associated with natural sounds and express sensory responses to the environment.

4. Making music in nature

Teaching and learning example:

- **Activity:** Encourage students to make their own music in nature. For example, you can use branches as percussion instruments or make simple songs using the sounds of water and wind.
- **Explore:** Conduct outdoor exploration to get musical ideas in nature, and let students explore the sounds and rhythms of nature.
- **Work:** Try making small pieces of music using sounds and materials that students have found in nature.

5. Symbolizing music and nature in new dimensions

Teaching and learning example:

- **Activity:** Work on musical representations of elements of nature. For example, teach me how to transform certain natural phenomena (rainy sounds, wind sounds, etc.) into musical symbols.
- **Work:** Have students compose new songs or rewrite existing songs by converting images of nature into musical symbols.
- **Project:** You can work on a project that combines nature and music to create a new form of musical expression.

6. Enjoy music freely in nature

Teaching and learning example:

- **Activities:** Allow students to have time to freely make music in nature. For example, encourage them to use a musical instrument freely outside or improvise with the sounds of nature.
- **Workshop:** Hold workshops to learn different ways to enjoy music in nature, and help students explore music freely.
- **Work:** Let students find ways to enjoy nature through musical activities that harmonize with nature.

7. Using your body to express music in nature and in nature in music

Teaching and learning example:

- **Activities:** Encourage students to learn movements and dances that express elements of nature. For example, practice gestures that express wind flows or waves.
- **Experience:** Provides an experience for students to integrate music and gestures through activities that express sounds or senses of nature with their bodies.
- **Work:** Work on a project that expresses music and natural elements through the body, and let students create creative works based on those expressions.

8. Connecting Music and Nature with Nature and Digital Media

Teaching and learning example:

- **Activity:** Use digital media to learn how to incorporate natural sounds or images into your music. For example, try sampling natural sounds or making nature-themed music using digital instruments.
- **Project:** Have students work on a project that connects nature and music through digital media, creating musical works with natural sounds and videos, for example.
- **Work:** Let students use digital tools to create creative media projects that combine nature and music.

Through specific activities and examples at each stage, students can effectively link music and the ecological environment. An Analysis of Sanje Song for Ecological Environmental Education Based on Music Curriculum

1. Children's Song: Nature is Orchestra

- ① the Whole Music



자연은 오케스트라

작사 이보림
작곡 박영신



1. 조그마한 보라색 꽃에 이슬방울 맺히는 소리
2. 예쁜 빛깔 파란 하늘에 하얀 구름 떠지는 소리

리 기쁨을 노래하는 청아한 박새 소리
리 호수 물 떠다니는 우아한 백조 소리

리 시원한 그늘만 들어주는 키 큰 단풍 나무
리 번갈아 없이 그 자리에 서나 의친구 되는

들과 산들바람의 이 중창소리 녹색찬디들의 편안 한 소리
산과 모슬길따라 발자국소리 바쁘게 다니는 다람쥐 소리

리 사랑해 자연아 나와 함께 해 주고 마워 오래토록 듣고 싶어
리

21 너의 소리 모든 소리에 울려 몇진 색깔만드네 아름다운 자연은

23 오케스트라 세계 최고의 오케스트라

The Music and Sheet of Children's Song for Music Class

◦ ② Text of Song²

■ Verse 1:

(1-4 bars) Small - the sound of dewdrops on purple flowers, (5-8 bars) The clear sound of a woodpecker singing joy,
(9-12 bars) The tall maple trees that always make you cool,

(bars 13-16) The sound of the double-wind of the mountain breeze, the comfortable sound of the green grass,
 (17-20 bars) I love you Nature, stay with me Thank you I want to hear you for a long time,
 (21-25 bars) All sounds good together to make a wonderful color beautiful nature is the orchestra -
 (26-29 bars) The best orchestra in the world-

■ Verse 2:

(1-4 bars) Pretty color - the sound of white clouds spreading in the blue sky,
 (5-8 bars) Elegant swans floating through the lake,
 (bars 9-12) Unchanging - the mountains that are always my friends in those places,
 (13-16 bars) The sound of a squirrel busy its footsteps along the path, (17-20 bars) I love you Nature, stay with me
 Thank you I want to hear you for a long time,
 (21-25 bars) All sounds good together to make a wonderful color beautiful nature is the orchestra -
 (26-29) The best orchestra in the world-

2. An Analysis of Sanjeok for Effective Ecological Environmental Education

The music composed for this study, "Nature is Orchestra," is a work with a melody based on poetry made against the backdrop of natural beauty, and it can be said to be an educational work for the ecological environment. If ecological environment education is conducted in the school field, existing works can be used, but as in this study, it can be effective for instructors to compose songs in consideration of students' level and taste. The lyric of "Nature is Bolim Lee (Dr.&Prof.)" is "Nature is O'Kestrang," and the composition is "Youngshin Park (a child's songwriter)."

Table 3. "Nature Is an Orchestra" song analysis

No.	Elements of music education	Analysis
1.	The Beat	6/8 beat (including 3/8 beat variations), double beat.
2.	The Tonality / Melody	A Flat Major/ Leap Progress is also used, but it is mainly sequential.
3.	Lyrics	The lyrics are set in nature.
4.	Rhythm	Point quarter notes, eighth notes, and sixteenth notes are mainly used in rhythms.
5.	Mood	It creates a warm and lyrical atmosphere.

IV. Conclusion

The purpose of this study is to conduct the following research in this way. Accordingly, the conclusion of the study is as follows.

First of all, we developed this study ' A Study Model for Music-Based Ecological Convergence Education' In order to conduct more effective classes using Environment Convergence Education, it is necessary to understand the meaning and characteristics of each step of the model and prepare teaching and learning methods and materials that can be applied immediately to one's music class after sufficient review. Second, appropriate children's songs are indispensable

for music-based convergence classes in the ecological environment. If teachers compose songs that take into account their students' situations, they will be able to lead to more effective classes. Third, it is possible to raise awareness about protecting and maintaining the global environment through music-based convergence classes in the ecological environment. It may be a good idea to increase the longing for natural sounds through learning activities related to soundscape. Forth, in music-based ecological environment education, it is possible to teach and learn by using all elements of music utilized in all forms. For example, it is possible to change lyrics, change melodies, record sounds from nature, and add body expressions depicting nature. Fourth, while conducting music-based environmental convergence classes, the natural characteristics of the music subject should not be compromised. In other words, the instructor must be aware of the fact that the music subject teaches around the main ideas in the subject that must be provided to learners, and it is necessary to make great efforts to promote the learner's musical achievement and confirm the results. Finally, through music-based ecological environment education, not only vocational information related to music (e.g., composer, performer, etc.) but also vocational information related to the ecological environment can be provided.

Through this study, we hope that effective ecological and environmental education will be achieved within the music subject and serve as a good example for the practice of 'sustainable education' assumed by the international community.

Appendix

(full Music with accompaniment part)

♩ = 60 자연과 함께 노래하듯이

5

8

1.조그마한 — 보라색 꽃 에 이슬방울 맺히는 소
2.예쁜 빛깔 — 파란 하늘 에 하얀 구름 퍼지는 소

13

리 기 뽐 을 노 래 하 는 청 아 한 딱 새 소 리
리 호 수 를 떠 다 니 는 우 아 한 백 조 소 리

17

시 원 한 그 - 늘 만 들 어 주 는 키 큰 단 풍 나 무
변 할 없 이 - 늘 그 자 리 에 서 나 의 친 구 되 는

20

들 과 산 들 바 람 의 이 중 창 소 리
산 과 오 슬 길 따 라 발 자 국 소 리

23

독 색 잔 디 들 의 편 한 한 소 리 사 랑 해 자 연 아
바 뻘 게 다 니 는 다 람 쥬 소 리

26

나 와 함 께 해 줘 고 마 워 오 래 토 록 듣 고 싶 어 너 의 소 리

29

모 든 소 리 어 울 러 몇 진 색 깔 만 드 네 아 름 다 운 자 연 은

32 오케스트라 - 세계 최고의 오케

35 1. 스트라 - 2. -

Footnotes

¹ This item is based on the work of (Lee et al., 2021).

² Due to the need to translate the Korean song into English, there's a minimal discrepancy with some of the words used.

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