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Original Article

A Study on an Instructional Model for Healing Music Creation Education Based on Generative AI

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ABSTRACT

Objective: This study aims to explore the field applicability and educational implications of an instructional model for healing music creation education based on generative AI, with a focus on its potential to address structural limitations in current music education and to support learners' emotional development and creative expression.

Method: A 12-week instructional model was restructured into four sample sessions and implemented in April 2026 at two elementary and secondary schools located in the metropolitan area. In-depth interviews were conducted with teachers who directly participated in the instruction, and the collected data were systematically categorized and analyzed through an expert panel consisting of ten specialists in music education, generative AI music, and healing music.

Result: The findings were derived into four major categories. First, current music education was found to have structural limitations, including a performance- and appreciation-centered operational structure, entry barriers caused by requirements in harmony and music notation, and increasing disparities in learner participation. Second, generative AI-based music creation classes were confirmed to expand accessibility to music creation, enhance learners' self-efficacy, facilitate emotional expression and healing functions, and promote resilience and a challenging attitude. Third, from the perspective of instructional operation, advantages such as increased student engagement and maintenance of instructional flow were identified, while concerns were raised regarding a lack of awareness of creative ownership over AI-generated outputs, disparities in digital environments, and the absence of copyright standards. Fourth, for effective implementation, a staged instructional structure consisting of emotional recognition, music generation, appreciation and reflection, and sharing and feedback was required, along with process-oriented activity design, redefinition of the teacher's role, and the establishment of digital infrastructure and systematic teacher training.

Conclusion: This study suggests that generative AI-based healing music creation education can complement the structural limitations of current music education and has the potential to function as an effective educational approach that supports learners' emotional development and creative expression in practical educational settings.

Keywords Generative AI, Healing Music, Music Creation Education, Instructional Model, Self-efficacy, Emotional Expression

INTRODUCTION

Purpose and Necessity of the Study

The advancement of artificial intelligence (AI) technology is accelerating structural transformation across society, and its influence is rapidly expanding beyond industry, culture, and the arts into the field of education. In particular, generative AI has attracted attention as a technology capable of autonomously producing various forms of content—including text, images, and

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music—beyond simple information retrieval or computational functions.[1] Representative generative AI tools such as ChatGPT, DALL·E, and Suno have already begun to be utilized in educational settings as supportive tools for creative activities.[2,3]

Korea's 2022 revised national curriculum identifies digital transformation driven by AI development as a key background for reform and presents the cultivation of digital and AI literacy as a core educational objective.[4] Likewise, the OECD emphasizes that the development of digital competencies among students and teachers are crucial elements in building a digital education ecosystem.[5] Accordingly, the question of how AI technologies can be effectively utilized and integrated within educational contexts has emerged as a central challenge faced by contemporary education.

In particular, the 2022 revised curriculum highlights creativity as a core competency, and creative activities in music education are increasingly recognized as educational practices that can substantively develop learners' creative thinking and self-expression abilities. Generative AI-based music creation enables a wide range of creative activities, including melody composition, accompaniment generation, genre transformation, and remixing,[4] thereby lowering entry barriers to creative participation and enhancing the flexibility of expression-oriented instructional design.[2,6] A survey conducted by Adobe and Advanis (2025) involving 2,801 teachers in the United States and the United Kingdom found that AI-based creative project experiences positively influenced students' confidence, self-expression, and emotional stability, indicating that the educational potential of generative AI-based music creation is gaining international attention.

However, creative activities in music education are, in practice, constrained by multilayered structural limitations. In elementary school textbooks, the creative domain tends to remain at the level of lyric writing or simple rhythmic composition, while more advanced compositional activities involving instruments are relatively limited.[7] This is largely because composition instruction traditionally presupposes prior knowledge of harmony and musical notation, which imposes a significant cognitive burden on learners and functions as a barrier to entry.[8]

Furthermore, Albert Bandura (1997) defined self-efficacy as an individual's belief in their ability to successfully perform a specific task, and perfectionistic tendencies or anxiety about failure in creative activities may lead to a decline in self-efficacy.[9] In music creation, where clear correct answers are absent and evaluation anxiety is prevalent, self-efficacy can easily deteriorate, resulting in psychological rigidity manifested as action paralysis.[10] From the perspective of Amy Edmondson's (1999) concept of psychological safety, such evaluation-centered instructional structures fail to meet the essential conditions necessary for creative engagement. These structural constraints act as critical barriers to realizing the fundamental values of music creation education—namely, learners' emotional growth and creative expression.

Generative AI-based music creation education is being proposed as a meaningful alternative capable of addressing these structural limitations. Generative AI provides new pathways for learners who have experienced constraints in creative activities due to limited technical skills or performance abilities, thereby contributing to improvements in educational equity and accessibility.[11] According to self-determination theory, intrinsic motivation is enhanced when the three basic psychological needs of autonomy, competence, and relatedness are satisfied.[12] A generative AI-based music creation environment enables learners to experience autonomy by controlling musical elements according to their intentions, to develop competence through iterative auditory feedback, and to establish relatedness through collaboration and sharing activities.

Kim (2024) empirically demonstrated that AI-based composition classes enhance learners' interest and confidence by mediating successful experiences.[13] Similarly, Han and Han (2025) reported that the application of parameter-based AI composition instruction significantly increased overall self-efficacy and its subcomponents—task difficulty preference, self-regulatory efficacy, and confidence—as well as musical interest.[14] As emphasized by Hannah Arendt, human beings reveal themselves and assume responsibility through action; thus, even within AI-mediated creative processes, instructional design must ensure that learners maintain a sense of agency and responsibility for their actions and creations.[15] This consideration is directly linked to the emotional objectives of healing music creation education.

Despite these potentials, existing research remains largely at the level of theoretical exploration or is limited to unpublished studies, and empirical, practice-oriented research in actual music education settings is still scarce. Kim, Kim, and Mo (2024) pointed out that domestic research on AI music education tends to remain theoretical, with tools largely limited to text prompt-based generative AI or general Edutech platforms.[13] Furthermore, as noted by Kim and Kim (2023), there is still a lack of school-based action research aimed at verifying the effectiveness of AI integration.[16] Park and Yang (2023) also emphasized the continued need for field-based, concrete studies on creative instruction using AI music generators.[17]

This suggests that a significant gap persists between theoretical discussions and practical evidence in generative AI-based music creation education, underscoring the necessity of field-oriented research that examines how instructional models function in real educational settings.

Accordingly, this study aims to develop an instructional model for generative AI-based healing music creation education, apply it directly in elementary and secondary school settings, and explore its practical implications through in-depth interviews with participating teachers. Through this process, the study seeks to incorporate diverse voices from the field to enhance the applicability of the instructional model and to propose concrete improvement strategies for increasing its structural completeness. Ultimately, this study intends to make

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both academic and practical contributions by exploring a new paradigm of music education that effectively supports learners' emotional growth and creative expression.

Research Questions

This study establishes the following research questions to examine the field applicability and educational implications of an instructional model for generative AI-based healing music creation education:

Research Question 1. How do structural constraints of creative activities and disparities in learner participation manifest in school music education?

Research Question 2. What educational effects does generative AI-based healing music creation instruction have on learners' creative accessibility, self-efficacy, emotional expression, and resilience?

Research Question 3. What are the strengths and concerns that emerge in the process of implementing generative AI-based healing music creation instruction?

Research Question 4. What instructional structures, teacher roles, and contextual support conditions are required for the effective implementation of an instructional model for generative AI-based healing music creation education?

MATERIALS AND METHODS

Development of the Instructional Model

In this study, the instructional model for generative AI-based healing music creation education was systematically developed through three sequential stages: literature review, expert interviews, and prototype development followed by pilot field evaluation.

A. Literature Review

As the first stage of instructional model development, the theoretical foundations and prior studies related to generative AI-based music creation education were comprehensively reviewed. Regarding the concept of generative AI and its educational applications, generative AI has evolved as a deep learning-based technology capable of autonomously producing various forms of content—including text, images, and music.[1,18] In the field of music education, it enables diverse creative activities such as melody composition, accompaniment generation, and genre transformation, thereby contributing to lowering learners' entry barriers.[2,6,19] By examining representative AI music generators such as AIVA, Suno, and Udio and their educational characteristics,[2,17,20] it was confirmed that music teachers are required to possess competencies in selecting and applying tools aligned with achievement standards.[6]

In addition, four ethical issues associated with the use of generative AI were reviewed: the weakening of the essential nature of music and art education, ambiguity in copyright responsibility, educational accountability in the context of uncritical acceptance, and disparities in access to AI tools.[21] The necessity of establishing a contribution-based copyright evaluation system was also examined,[22,23] ensuring that ethical considerations were integrally reflected in the instructional model design.

Regarding the current status and limitations of music creation education, as well as the theoretical foundations of emotionality and creativity in healing music, it was identified that current music education is primarily centered on singing and appreciation, resulting in insufficient emphasis on creative activities.[4,7] Furthermore, the requirement of prior knowledge in harmony and musical notation functions as a significant entry barrier.[8]

In relation to learners' psychological mechanisms, theoretical frameworks including Bandura's (1997) self-efficacy theory, Edmondson's (1999) concept of psychological safety, and Deci and Ryan's (1985) self-determination theory were examined. These frameworks provided a basis for understanding how evaluation anxiety in creative activities can lead to psychological rigidity manifested as action paralysis.[10,24] Moreover, music was confirmed to function as a healing medium supporting emotional regulation and psychological recovery.[6] Based on Hannah Arendt's concept of action and agency,[15] it was theoretically established that instructional design should ensure learners' sense of responsibility and agency in AI-mediated creative processes.

With respect to creativity theories, Rhodes's (1961) 4P model, Guilford (1970), Csikszentmihalyi's (1996) flow theory, Wallas's (1926) four-stage model of creative problem solving, Torrance's (1978) theory of creative processes, and Lim et al.'s (2009) divergent–convergent thinking model were reviewed. These theories provided the foundation for a staged instructional structure consisting of emotional recognition, music generation, appreciation and reflection, and sharing and feedback.

Regarding the theoretical foundations for instructional model development, Piaget's (1972) theory of the concrete operational stage and Vygotsky's (1978) theory of the zone of proximal development were examined, establishing a basis for designing iterative learning environments in which AI functions as a cognitive partner providing appropriate levels of challenge and support. Dewey's concept of the wholeness of experience further supported the necessity of designing a process-oriented instructional model that integrates cognitive,[25] emotional, and physical dimensions, rather than focusing solely on efficiency and outcomes.

In addition, the need to shift from outcome-oriented education to a paradigm emphasizing questioning, interpretation, and judgment,[9] as well as the importance of expert collaboration systems and systematic support for technology-integrated instruction,[26] were identified. These considerations ensured that the instructional model was theoretically grounded as a process-

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oriented structure supporting learners' emotional growth and creative expression.

B. Expert Interviews

As the second stage of instructional model development, in-depth interviews with elementary and secondary school music teachers were conducted in parallel with expert consultations.

First, in-depth interviews were conducted with elementary and secondary school teachers from two schools in the metropolitan area, focusing on the current status of school music education, perceptions of generative AI tool usage, expectations and concerns regarding instructional implementation, and essential elements required for an effective instructional model. Through these interviews, it was confirmed from the teachers' perspectives that current music classes are predominantly centered on singing and appreciation, resulting in insufficient emphasis on creative activities, increasing disparities in student participation, and the potential of generative AI tools to enhance accessibility to creative activities and improve self-efficacy.

Subsequently, to categorize the key findings from the interviews and to validate the instructional model, an expert panel consisting of ten specialists in relevant fields—including music education, generative AI music, and healing music—was organized. The panel encompassed diverse areas of expertise such as music education, pedagogy, music therapy, AI music generation, educational technology, adolescent psychology, and arts-integrated education. The experts reviewed the categorized interview data and provided consultation on the structural validity of the instructional model.

Through expert consultation, the core components of the instructional model were identified, including a staged structure consisting of emotional recognition, music generation, appreciation and reflection, and sharing and feedback; the necessity of process-oriented activity design; the redefinition of the teacher's role; and the support conditions required for field implementation.

C. Prototype Development and Pilot Field Evaluation

As the third stage of instructional model development, a prototype of the instructional model was developed based on the theoretical and practical foundations derived from the literature

Table 1. Theoretical Foundations for the Development of the 12-Week Instructional Model

Stage	Week	Core Activities	Theoretical Basis (Prior Research)	Expected Outcomes
Introduction	**Week 1**	Orientation on generative AI music tools (Suno basics)	2022 Revised Curriculum: Digital AI literacy enhancement goals[4]; ChatGPT/Suno as AI tool utilization[2,3]	Basic understanding of AI music generation tools and development of digital literacy
	Week 2	Understanding healing music concepts; emotional recognition activities (emotion cards & journaling)	Aesthetic experience and emotional problem-solving[7,8]; Self-determination theory: autonomy, competence, relatedness[11]	Improvement in emotional recognition and ability to connect music with personal experiences
Exploration	**Week 3**	Music creation practice using Suno (mood-based melody generation)	AI music creativity characteristics[17]; Constructivism[25]	Acquisition of basic AI-based music composition skills and exploration of musical elements
	Week 4	ChatGPT-based lyric writing (prompt-centered writing)	Project-based learning[27]; Vygotsky's social constructivism[28]	Experience of emotional expression through prompt-based language creation
	Week 5	Integrated AI music creation (melody + lyrics); feedback activities	Creative convergence learning[29]; Bandura's social learning theory[30]	Development of creative problem-solving skills and iterative improvement through feedback
Creation	**Week 6**	Creation of emotion-themed healing music (personal project)	Formation of competence through successful experience[10,31]; Psychological safety[32]	Development of personal creative expression and practical composition skills
	Week 7	Refinement and rearrangement of emotion-themed music (peer feedback)	Iterative revision and feedback learning[14]; Creative problem-solving[33]	Improvement of collaboration and communication skills
	Week 8	Modeling and expansion of healing music (multimedia integration project)	SDT competence and motivation[12]; Multimodal learning[21]	Expansion of expressive ability through integrated media and visual thinking
Reflection	**Week 9**	Sharing creations and language-based interpretation (emotion–music storytelling)	Experiential learning[23]; Csikszentmihalyi's flow theory (1996)[31]	Enhancement of metacognitive reflection ability and emotional understanding
	Week 10	Evaluation of creative process and outcomes (portfolio assessment)	Process-centered evaluation and reflective learning[9,34]	Improvement of creativity and self-evaluation ability
Integration	**Week 11**	Presentation and sharing of final works (creative music recital)	Cooperative learning[14]; Sharing-based learning[12]	Strengthening of presentation skills and confidence
	Week 12	Reflection and wrap-up of the course; ethics of AI music creation	AI ethics and creative copyright [21]; Critical thinking[35]	Development of responsible AI usage attitude and ethical awareness

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review and expert interviews, and a pilot field evaluation was conducted through its application in actual educational settings. The prototype was developed by restructuring the originally designed 12-week instructional model into a four-session sample format corresponding to a quarterly unit. It was designed to ensure organic connections among each instructional stage while taking into account the developmental characteristics of elementary and secondary school learners.

The pilot field evaluation was conducted over a one-month period in April 2026 at two schools located in the metropolitan area. Prior to the implementation of the study, procedures were carried out to obtain consent from school principals and homeroom teachers, as well as permission from students' guardians. The instruction was conducted during regular class hours, and through classroom observations and post-instruction interviews with participating teachers, the field applicability of the prototype and areas for improvement were identified.

The results of the field evaluation indicated increased active participation among students who had previously been passive in music activities, expansion of attempts at self-expression, and the emergence of collaborative learning experiences during the process of sharing creative outputs. At the same time, several limitations were identified, including a lack of awareness of creative ownership regarding AI-generated outputs, the risk of emotional expression being diluted due to excessive focus on tool usage, and disparities in digital environments between schools. These findings were utilized as practical evidence for refining the instructional model.

Table 2. General Course Information for Generative AI-Based Healing Music Creation (Elementary Level)

Category	Description
Course Title	Creating Healing Music with Generative AI: Expressing My Emotions Through Music
Grade	Elementary School (Grade 5)
Number of Sessions	4
Difficulty Level	Medium
Subject	Integrated Music and Language Arts
Unit	Creation and Expression / My Story
Theme	Emotional Expression
Tools	Suno, ChatGPT

Table 3. Learning Objectives and Achievement Standards (Elementary Level)

Category	Description
Learning Objectives	• Students can create healing music expressing their emotions using Suno.• Students can generate and revise lyrics reflecting their emotions using ChatGPT.• Students can share their creations and develop an attitude of respecting others' emotions.
Achievement Standards	• [6M-03-01] Understand musical elements (rhythm, melody, harmony, tempo, timbre) and apply them in creative activities.• [6M-04-01] Understand various contexts in which music is used in daily life and express emotions through music.• [6L-03-05] Write texts expressing thoughts and emotions and utilize digital tools during the writing process.

Table 4. Session-by-Session Instructional Design (Elementary Level)

Session	Instructional Stage	Learning Content	Activity Strategy	Tool Usage
Session 1	Tool Learning & Emotional Recognition	• Explore basic Suno functions (mode/genre selection, teacher demonstration, hands-on practice)• Generate emotion-related vocabulary using ChatGPT• Complete an emotion exploration worksheet	• Use "emotion color cards" for emotional recognition• Share emotional vocabulary	• Suno mode exploration• ChatGPT emotion word generation
Session 2	Problem Understanding & Music Exploration	• Create initial Suno music drafts reflecting personal emotions (at least two versions)• Generate lyric drafts using ChatGPT• Compare and select outputs	• Ensure learner autonomy in selection• Prompt reflection ("Why did you choose this music?")• Encourage exploration of diverse outputs	• Suno music generation• ChatGPT lyric generation
Session 3	Problem Solving & Music Creation Completion	• Revise and refine outputs (iterative process)• Write titles and creative intentions• Write reflection journals	• No limitation on revision cycles (ensure psychological safety)• Teacher facilitates reflection through emotional questioning• Begin individual creative portfolio	• Suno music editing• ChatGPT lyric refinement
Session 4	Evaluation, Sharing, and Reflection	• Group presentations (music playback and explanation)• Peer appreciation using feedback cards• Mutual feedback and class reflection	• Flexible presentation formats (speech, writing, drawing)• Structured feedback ("What was good?" / "What was interesting?")• Emphasize ownership of created works	• Sharing Suno creations• Presenting ChatGPT outputs

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Table 5. General Course Information for Generative AI-Based Healing Music Creation (Secondary Level)

Category	Description
Course Title	The Sound of My Emotions: Creating Healing Music with Generative AI
Grade	Middle School (Grade 2)
Number of Sessions	4
Difficulty Level	Medium
Subject	Integrated Music and Language Arts
Unit	Creation and Expression / Emotion and Music
Theme	Emotional Expression and Reflection
Tools	Suno, ChatGPT

Table 6. Learning Objectives and Achievement Standards (Secondary Level)

Category	Description
Learning Objectives	• Students can create and revise healing music reflecting their emotional states using Suno. • Students can generate lyrics reflecting emotions using ChatGPT and critically review and revise the outputs. • Students can explain the intention and process of their creations linguistically and recognize copyright and ethical issues associated with AI-based creation.
Achievement Standards	• [9M-03-02] Understand musical elements and apply them to create or transform music. • [9M-04-02] Understand the relationship between music and human emotions, society, and culture, and express oneself through music creation. • [9L-03-04] Write texts reflecting personal experiences and emotions and reflect on the writing process using digital tools. • [9E-03-03] Understand ethical use of AI tools and practice responsible attitudes toward created works.

Table 7. Session-by-Session Instructional Design (Secondary Level)

Session	Instructional Stage	Learning Content	Activity Strategy	Tool Usage
Session 1	Tool Learning & Emotional Recognition	• Introduction and demonstration of Suno and ChatGPT functions • Exploration of emotional spectrum and identification of current emotional state • Practice generating emotion-related words and sentences using ChatGPT	• Teacher demonstration followed by hands-on practice • Use of emotional checklist • Mapping connections between emotions and music	• Suno basic exploration • ChatGPT emotion generation
Session 2	Problem Understanding & Music Exploration	• Create at least two healing music pieces using Suno • Generate and compare lyric drafts using ChatGPT • Evaluate and select appropriate outputs	• Provide justification for selection decisions • Group discussion ("What emotions are reflected?") • Recognize the scope of AI involvement	• Suno music generation • ChatGPT lyric drafting
Session 3	Problem Solving & Music Creation Completion	• Revise and refine selected outputs (iterative process) • Record creative intention and process (reflection journal) • Write titles and descriptions of creations using ChatGPT	• Recognize revision as part of learning • Teacher-guided reflection ("Why was this modified?") • Discuss boundaries between AI-generated and human-created content	• Suno music editing • ChatGPT description writing
Session 4	Evaluation, Sharing, and Reflection	• Present individual/group works and appreciation • Conduct peer feedback using empathy-question structure • Discuss copyright and ethical issues related to AI-generated works	• Require inclusion of intention, process, and emotional meaning in presentations • Apply copyright checklist for self-evaluation • Discuss "Who owns the created work?"	• Sharing Suno creations • Presenting ChatGPT outputs

Participants of the In-Depth Interviews

The participants of this study consisted of elementary and secondary school music teachers as well as a group of related experts. In the first stage, classroom observations and in-depth interviews were conducted with elementary and secondary school teachers from two schools located in the metropolitan area. The interviews focused on students' responses during class, teachers' instructional experiences, perceptions of the use of generative AI tools, and their limitations. The primary objective was to explore the field applicability of the instructional model from the practical perspectives of teachers.

In the second stage, an expert panel consisting of ten specialists in relevant fields—including music education, generative AI music, and healing music—was organized to categorize the key findings derived from the in-depth interviews. The expert group was composed of individuals with a balanced combination of academic expertise and practical field experience, and they were responsible for examining the validity of the categorization and interpretation of the interview data.

Research Procedure

This study designed a qualitative research procedure that combines instructional implementation and in-depth interviews with elementary and secondary school participants in order to explore the field applicability of an instructional model for

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Table 8. Characteristics of the Expert Panel

No.	Initials	Gender	Age	Affiliation	Area of Expertise	Experience
1	K.S.H	Female	52	University A, Department of Musicology	Music education, curriculum design	Professor, 23 years
2	L.J.W	Female	48	University B, Department of Education	AI-based instructional design, EdTech	Professor, 18 years
3	P.M.K	Female	45	University C, Department of Music	Healing music, music therapy	Professor, 15 years; Music therapist, 12 years
4	C.H.J	Male	41	D Music Therapy Research Institute	Music therapy, emotional regulation	Music therapist, 16 years
5	S.Y.R	Female	39	University E, Department of Composition	AI music generation, digital composition	Professor, 10 years; AI music development, 7 years
6	O.D.H	Male	44	F Office of Education (Scholarship Program)	Elementary music education, curriculum	Teacher, 15 years; Scholarship researcher, 5 years
7	H.B.S	Female	37	G Research Institute	Generative AI, content copyright	Researcher, 11 years
8	Y.C.N	Male	50	University H, Department of Psychology	Adolescent emotion, self-esteem	Professor, 20 years
9	J.S.E	Female	43	I Arts Education Center	Arts integration education, creativity education	Researcher, 14 years; Field instructor, 8 years
10	M.K.T	Male	46	University J, Department of Educational Engineering	Educational engineering, instructional design	Professor, 17 years

generative AI-based healing music creation education.

The study was conducted over a one-month period in April 2026 at two schools located in the metropolitan area. The participating schools were selected by the researcher, and prior to the implementation of the study, consent was obtained from school principals and homeroom teachers, as well as permission from the guardians of the students. These procedures constitute essential ethical requirements for conducting educational research involving minors.

The instruction was implemented by restructuring the originally designed 12-week instructional model into a four-session sample format corresponding to a quarterly unit, and it was conducted during regular class hours. Each session was carried out with direct observation by the teacher, and after the completion of the instruction, in-depth interviews were conducted with the participating teachers based on their observations. The interviews focused on students' responses observed in the classroom, patterns of participation, and emotional changes. Through teachers' narratives, the study aimed to derive the field applicability and practical implications of the instructional model. In other words, the interview data from two field teachers were intended to ensure depth in qualitative inquiry, and these findings were further categorized and validated through consultation with a panel of ten experts.

Since this study involves minor students and is conducted within regular curricular time, ethical considerations were particularly emphasized. Accordingly, prior informed consent was obtained from school principals, homeroom teachers, and students' guardians before the implementation of the study. In addition, it was established as a principle that student-generated outputs and teacher interview data would not be used for purposes other than the research.

Interview data were analyzed through thematic analysis following Braun and Clarke's (2006) six-phase procedure. Transcripts were initially open-coded, then organized into themes through iterative comparison. The expert panel (Table 8) reviewed the resulting categories to ensure analytic validity. Data saturation was reached when no new themes emerged from additional interview material.

RESULTS

First Category: Current Status and Limitations of School Music Education

A. Subcategory 1-1. Lack of Opportunities for Emotional Expression

The structural limitation of opportunities for students' emotional expression in school settings emerged as a common theme across interviews with both elementary and secondary school teachers participating in this study.

A lack of emotional margin and a tendency to suppress or avoid emotions among students were identified.

"Students today generally seem to lack emotional space. … Rather than expressing their emotions comfortably, they often tend to suppress or avoid them." (T.M.J)

"Especially during middle school years, when emotional

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changes are significant, there are still insufficient opportunities to appropriately express or resolve these emotions. Therefore, I feel that activities addressing emotional aspects are necessary within school classes." (Y.C.N)

"I feel that the differences in expression styles and levels of participation among students are becoming increasingly pronounced. This is particularly evident in situations that require creative activities or free expression." (T.E.N)

A reduction in opportunities for emotional expression due to performance assessment- and skill-oriented instruction was also identified.

"In existing classes, the emphasis on performance assessments and skill-based activities often limits the full expression of emotions. … I believe music classes need to be conducted in a way that provides opportunities for emotional release and expression." (K.S.H)

"Overall, classes tend to focus on singing and appreciation, and creative activities are relatively lacking." (T.E.N)

"I think the direction of instruction needs to shift so that students can experience music as 'expression' rather than 'evaluation.'" (J.S.E)

A shared sense of limitation was also observed regarding the inability of current instructional structures to deeply engage with individual students' emotions.

"Although some emotional expression activities are included, they do not reach a level where individual students' emotions are explored in depth." (T.E.N)

"For students who find it difficult to express emotions verbally, music can serve as an indirect means of expression. However, because performance assessments and skill-based activities are emphasized in existing classes, emotional expression is not fully realized." (P.M.K)

Despite the fact that middle school represents a developmental transition period characterized by intensified emotional changes, the school environment fails to sufficiently provide structures that accommodate these needs. Generative AI-based music creation has been suggested as a pedagogical strategy that can expand learners' self-expression and enhance creativity and engagement.[36,37]

The tendency for creative activities in elementary school textbooks to remain at the level of lyric writing or simple rhythmic composition,[7] along with the entry barriers imposed by prior theoretical requirements such as harmony and musical notation,[8] suggests that evaluation-centered instructional structures structurally constrain opportunities for emotional expression. Furthermore, evaluation anxiety in creative activities has been shown to reduce self-efficacy and lead to action paralysis, resulting in psychological rigidity.[10,24] This serves as a theoretical basis for explaining the structural limitations of current instructional practices in accommodating individual students' emotional needs.

B. Subcategory 1-2. Structural Constraints of Creative Activities

Interviews revealed that the insufficient implementation of creative activities in current school music education is influenced by a combination of instructional practices, learners' cognitive burden, and practical constraints faced by teachers.

A lack of emphasis on creative activities due to a singing- and appreciation-centered instructional structure was identified.

"Current music classes are conducted mainly based on textbooks, including appreciation, singing, and basic rhythm activities. However, due to time constraints, creative activities are relatively limited." (T.E.N)

"Although students enjoy music, I feel that opportunities for expressing their own ideas through music are not sufficiently provided." (O.D.H)

"Music classes need to move beyond simple skill acquisition and be oriented toward providing opportunities for emotional release and expression." (K.S.H)

Entry barriers caused by the requirement of prior knowledge such as harmony and musical notation were also identified.

"Students show interest in free expression activities, but many struggle because they do not know how to approach them." (T.E.N)

"Many students hesitate to participate due to fear of making mistakes. In particular, students who lose confidence in instrument playing or singing tend to become increasingly passive." (Y.C.N)

"In the past, composition and arrangement were perceived as difficult activities, leading to participation by only a few students. However, with AI, even students with limited musical background knowledge can produce outcomes relatively easily." (T.M.J)

Time constraints and teachers' instructional burden were also identified as practical barriers to implementing creative activities.

"The large differences in students' levels are the most challenging aspect. … When attempting creative activities, there is also a burden in terms of time and instructional methods." (T.E.N)

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"Initially, the idea that AI could create music was interesting, but I was uncertain about its educational significance. I was concerned that it might become an activity where students simply receive results." (L.J.W)

"Since digital environments differ across schools, there may be difficulties in instructional implementation, and the preparation burden on teachers is not insignificant." (T.M.J)

The tendency for creative activities in elementary school textbooks to remain at the level of lyric writing or simple rhythmic composition aligns with the marginalization of creative activities within performance-centered instructional structures.[4,7] The requirement of prior theoretical knowledge such as harmony and musical notation functions as a cognitive barrier,[8] and according to Bandura's (1997) theory of self-efficacy development, low self-belief and emotional anxiety may lead to action paralysis.[11,24]

To effectively implement AI-based music creation, it is necessary to consider both the establishment of digitally supportive learning environments and the enhancement of teachers' professional competencies.[38] The importance of systematic support systems that go beyond simple provision of tools is also emphasized.[26]

C. Subcategory 1-3. Disparities in Learner Participation

In school music education settings, disparities in learner participation were identified as a complex issue influenced not only by differences in ability but also by psychological and structural factors.

Passive participation due to differences in musical confidence was commonly observed.

"The large differences in students' levels are the most challenging aspect. Some students actively participate, but those lacking confidence in music often feel burdened by the activities themselves." (T.E.N)

"Students who lose confidence in playing instruments or singing tend to become increasingly passive." (Y.C.N)

"With AI, even students with limited musical background knowledge can relatively easily produce results." (T.M.J)

An increasing gap in expression styles and participation levels among students was also observed.

"I feel that the differences in expression styles and participation levels among students are becoming increasingly pronounced. … Some students have difficulty expressing their opinions or tend to be passive in activities." (T.E.N)

"This difference becomes more evident in situations requiring creative activities or free expression." (J.S.E)

"Activities using sound, rhythm, and atmosphere can provide opportunities for students who struggle with verbal expression." (P.M.K)

Avoidance of participation due to fear of making mistakes was also identified.

"Many students hesitate to participate because they are afraid of making mistakes. Especially those who lose confidence tend to become more passive." (Y.C.N)

"The direction of instruction needs to change so that students experience music as 'expression' rather than 'evaluation.'" (O.D.H)

"The process of generating music based on one's feelings itself can be engaging for students." (T.M.J)

Bandura (1997) emphasized that low self-belief and emotional anxiety in the early stages of self-efficacy development can lead to avoidance of participation,[30] and Park (2015) identified that early success experiences and positive feedback are critical factors in developing musical self-efficacy.[39] Generative AI provides new pathways for learners previously constrained by technical limitations, thereby enhancing educational equity and accessibility.[12] According to self-determination theory, the satisfaction of autonomy, competence, and relatedness leads to increased intrinsic motivation.[13] From the perspective of psychological safety,[34] instructional structures that reduce fear of failure and allow repeated attempts are essential conditions for overcoming participation avoidance.[11]

Second Category: Educational Effects of Generative AI-Based Music Creation Instruction

A. Subcategory 2-1. Expansion of Creative Accessibility and Enhancement of Self-Efficacy

Generative AI-based music creation instruction was found to provide practical access to creative activities for learners who were structurally excluded in traditional music education, while also enhancing self-efficacy through achievement experiences.

The ability to generate outputs without prior musical knowledge was highlighted as a key educational value.

"Previously, composition and arrangement were perceived as difficult, so only a few students actively participated. With AI, even those without musical background knowledge can easily produce results." (T.M.J)

"Many students had ideas but struggled to turn them into actual outputs. With AI, they can quickly realize their ideas." (L.J.W)

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"It allows students to participate in creative activities even if they are not good at music, which can boost their confidence." (S.Y.R)

The formation of self-belief ("I can do it") through achievement experiences was also confirmed.

"When students create their own music within a short time, they feel a sense of achievement and develop the belief that 'I can do it.'" (T.M.J)

"Repeated experiences like this can contribute to the development of self-efficacy and self-esteem, especially for students who lack confidence in music." (Y.C.N)

"Students who were previously passive in expression activities showed positive changes when their ideas were transformed into recognized works." (T.E.N)

Increased participation among previously passive students was also observed.

"It was impressive to see students who were usually passive actively participating. … Even quiet students attempted to explain their results." (T.E.N)

"Students familiar with digital environments are likely to show interest in AI-based activities, leading to increased participation." (T.M.J)

Generative AI lowers entry barriers caused by technical limitations, thereby improving accessibility and equity in education.[2,6,11] Bandura's (1997) theory of self-efficacy and Kim's (2024) empirical findings support the role of achievement experiences as a mechanism for transforming learners' belief systems.[9,30] Furthermore, Han and Han (2025) reported significant improvements in self-efficacy and musical interest,[14] providing empirical evidence that the satisfaction of autonomy, competence, and relatedness leads to increased participation among previously passive learners.

B. Subcategory 2-2. Emotional Expression and Healing Function

Generative AI-based music creation instruction was found to facilitate learners' emotional expression and to function as a medium supporting psychological recovery.

It was confirmed that music can serve as an indirect means of expression for students who have difficulty expressing themselves verbally.

"Compared to other subjects, music classes provide a space where students can express their emotions relatively freely. In particular, for students who find it difficult to express emotions verbally, music can function as an indirect means of expression." (P.M.K)

"When students have difficulty expressing their emotions in words, the experience of expressing them indirectly through music can be meaningful." (C.H.J)

"In particular, activities that utilize sound, rhythm, and atmosphere can provide opportunities for participation even for students who struggle with verbal expression." (P.M.K)

The importance of the reflective process—expressing emotions through music and then listening to them again—was emphasized.

"When students express their emotions through music and then listen to the results again, they are able to recognize their emotions from a more distanced perspective." (C.H.J)

"It should not end with simply generating music; the process must include emotional recognition → music generation → appreciation and reflection → sharing and feedback." (M.K.T)

"The processes of emotional recognition, music generation, appreciation and verbalization, sharing, and feedback must be organically connected, with an emphasis on process-oriented rather than result-oriented activities." (T.E.N)

It was also confirmed that learners can experience emotional regulation by recognizing their emotions from a more distanced perspective.

"AI-based creation allows for iterative revision, so it does not end with a single failure but enables multiple attempts. As such experiences accumulate, the burden of failure decreases, leading to a willingness to try again, which is connected to resilience." (C.H.J)

"It helps expand not only creativity but also experiences of self-expression. Additionally, the activities themselves were low-pressure, allowing students to participate comfortably." (T.E.N)

Generative AI functions as a collaborative medium that concretizes and expands individual imagination,[40] thereby opening pathways for musical expression for learners with limited verbal abilities.[36,37] According to John Dewey's concept of the wholeness of experience, the process of expressing emotions through music and reflecting upon them constitutes a holistic experience through which learners explore and reinterpret their inner selves.[21]

Furthermore, as emphasized by Hannah Arendt, instructional design must ensure that learners maintain a sense of agency and responsibility even in AI-mediated creative processes.[15] The experience of recognizing emotions from a distanced perspective is not merely a form of psychological relaxation but represents an educational process connected to the development of learners' subjectivity.[9]

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C. Subcategory 2-3. Development of Resilience and a Challenging Attitude

Generative AI-based music creation instruction was found to contribute to the development of resilience by reducing learners' fear of failure through its structural characteristics that allow for iterative attempts and revisions, while also promoting a willingness to retry and collaborative learning experiences.

A reduction in fear of failure due to the possibility of iterative revision was identified.

"AI-based creation allows for repeated revisions, so it does not end with a single failure but enables multiple attempts, which is a positive aspect." (T.M.J)

"As these experiences accumulate, the burden of failure decreases, leading to a willingness to try again, which is connected to resilience." (C.H.J)

"Because results can be quickly confirmed, the flow of the class is not interrupted, and students can attempt various approaches." (T.M.J)

It was confirmed that an environment allowing repeated attempts is linked to the development of a willingness to retry.

"It is positive that students can try multiple times rather than ending with a single failure." (C.H.J)

"The process of comparing multiple outcomes and reflecting on their own choices can also be meaningful learning." (J.S.E)

"It should not remain at the level of simply selecting results; the process of reflecting one's intentions must also be included." (J.S.E)

Collaborative learning experiences and mutual respect through sharing outcomes were also observed.

"There was an enjoyable atmosphere as students shared their results with each other. … Listening to peers' music, discussing impressions, and comparing different expressions of similar themes can lead to collaborative learning." (T.E.N)

"The process of explaining one's own work and responding to others' works is particularly important. These processes allow students to perceive the activity as meaningful learning rather than a simple task." (M.K.T)

According to Edmondson's (1999) concept of psychological safety, a creative environment that allows iterative revision structurally provides the essential conditions for creative engagement, while also functioning as an environmental condition that alleviates psychological rigidity leading to action paralysis .[10]

From the perspective of Vygotsky's (1978) zone of proximal development, AI functions as a cognitive partner, enabling learners to progressively engage in higher-level tasks through repeated attempts. Furthermore, the satisfaction of relatedness needs in self-determination theory,[12] along with the significant improvement in musical interest reported by Han and Han (2025),[13] suggests that collaborative learning experiences through sharing outcomes can lead to changes in collective perceptions of the value of music.

Third Category: Expectations and Concerns in the Instructional Implementation Process

A. Subcategory 3-1. Advantages in Instructional Implementation

Generative AI-based music creation instruction was found to increase student participation by aligning with learners' affinity for digital environments, while also enhancing instructional efficiency and flexibility through its structural capability for immediate generation and verification of outputs.

An increase in student engagement due to digital environment affinity was identified.

"The greatest advantage is that student participation can increase. Students who are familiar with digital environments are more likely to show interest in AI-based activities, and those who were previously passive in music classes can participate more actively." (T.M.J)

"The process of generating music based on students' own moods or feelings itself can stimulate interest." (L.J.W)

"Overall, students showed interest, and there was an enjoyable atmosphere as they shared their results with each other." (T.E.N)

The ability to quickly verify results was also found to maintain instructional flow and enable diverse attempts.

"Because results can be quickly confirmed, the flow of the class is not interrupted, and students can try various approaches." (T.M.J)

"The process of exploring multiple possibilities rather than finding a single correct answer is itself meaningful." (M.K.T)

Flexibility in instructional management through teachers' immediate observation of student responses was also observed.

"From the teacher's perspective, being able to immediately observe students' responses allows for greater flexibility in managing the class." (T.E.N)

"Teachers should go beyond simply instructing how to use AI tools and instead support students in exploring their emotions and connecting them to music." (K.S.H)

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The OECD's emphasis on digital competency development and the 2022 revised curriculum's focus on digital and AI literacy suggest that generative AI-based instruction aligns with the current educational paradigm.[41,42] Furthermore, repeated exploration based on Piaget's (1972) theory of the concrete operational stage can be interpreted as an instructional approach aligned with learners' cognitive developmental characteristics.[35]

However, given the limitation that prompt-based AI composition tools may not fully reflect the creative thinking process,[27] music teachers are required to develop competencies to understand the characteristics and mechanisms of AI music generators and to function as active facilitators throughout the instructional process.[6,43]

B. Subcategory 3-2. Concerns and Limitations

While generative AI-based music creation instruction presents diverse educational possibilities, interviews revealed that it also involves complex concerns and limitations in actual field implementation.

Concerns were raised regarding students' lack of awareness of authorship over AI-generated outputs.

"The biggest concern is whether students can perceive AI-generated outputs as their own creations. In some cases, it may become an activity where students simply generate results without deep reflection." (T.M.J)

"If students rely on AI-generated results, their initiative in expression may weaken." (L.J.W)

"It should not remain an activity of simply producing results; the process of explaining one's intentions and choices must be included." (M.K.T)

There was also concern that excessive focus on tool usage may dilute the process of emotional expression.

"There is a risk that students may focus more on using the tool itself rather than on emotional expression. Therefore, teachers must guide the class toward emotional expression and reflection rather than a technology-centered approach." (T.M.J)

"One concern was that students might focus only on results without engaging in the process." (K.S.H)

"It is important for teachers to guide students not only to use the tool but also to reflect their own thoughts and intentions." (J.S.E)

Disparities in digital infrastructure between schools and the burden of teacher preparation were also identified as limitations.

"Since digital environments differ across schools, there may be difficulties in implementing instruction, and the preparation burden on teachers is not insignificant." (T.M.J)

"Differences in environments may lead to disparities, so support between schools is necessary." (O.D.H)

The absence of clear standards regarding copyright and personal data was also raised as a concern.

"Clear guidelines regarding copyright and personal data must be established to allow for practical application without burden." (H.B.S)

"It is important to guide students to verify and specify the sources of audio and rhythm data they use, and to clearly document the music, data, and AI models used in their outputs or reports." (H.B.S)

Depending on the extent to which AI intervenes in the creative process, judgments regarding the legitimacy and originality of creative works may become increasingly complex.[44] From Hannah Arendt's perspective, ambiguity in the attribution of action and outcomes may lead to a loss of learners' sense of responsibility.[11,15]

Furthermore, considering Gong (2025)'s emphasis on the complex cognitive processes of human creativity and Dewey's concept of the wholeness of experience (Park, 2017),[21,45] the risk of emotional expression being diluted due to excessive focus on tool usage may conflict with the essential values of arts education. Additionally, disparities in access to AI tools leading to unequal educational opportunities (Lee et al., 2025),[22] as well as the need for institutional frameworks for copyright evaluation,[46] are interpreted as urgent challenges for field implementation.[23,25]

Fourth Category: Conditions for Designing an Effective Instructional Model

A. Subcategory 4-1. Core Elements of Instructional Structure

Interviews confirmed that, for a generative AI-based healing music creation instructional model to effectively achieve its educational goals, an integrated implementation of a clear staged structure, process-oriented activity design, and an environment that supports iterative attempts is essential.

A staged structure consisting of emotional recognition → music generation → appreciation and reflection → sharing and feedback was identified as a core element.

"It should not end with simply generating music; the process must include emotional recognition → music generation → appreciation and reflection → sharing and feedback. In particular, the process of explaining one's own work and responding to others' works is important." (M.K.T)

"The processes of emotional recognition, music generation, appreciation and verbalization, sharing, and feedback must be

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organically connected, with an emphasis on process-oriented rather than result-oriented activities." (O.D.H)

The necessity of designing process-oriented activities rather than result-oriented ones was emphasized.

"The direction of instruction needs to change so that students can experience music as 'expression' rather than 'evaluation.'" (T.E.N)

"It is important to design instructional structures that emphasize process-oriented activities rather than result-oriented ones." (M.K.T)

"Therefore, teachers should guide the class so that it becomes focused on emotional expression and reflection rather than technology-centered instruction." (T.M.J)

The provision of an environment that allows repeated attempts and revisions was also identified as a key condition.

"AI-based creation allows for iterative revision, so it does not end with a single failure but enables multiple attempts. As these experiences accumulate, the burden of failure decreases, leading to a willingness to try again, which is connected to resilience." (C.H.J)

"By providing an environment that allows repeated attempts and revisions, student participation and persistence can be enhanced, and teachers can play a role in facilitating emotional expression. … When these elements are integrated, the instructional model can effectively support elementary students' self-expression and learning engagement." (T.E.N)

According to John Dewey's concept of the wholeness of experience, learning acquires full meaning through the integration of cognitive, emotional, and physical dimensions.[21] As Rhodes's (1961) 4P model identifies process as a core component of creativity,[34] the staged structure from emotional recognition to sharing and feedback represents an educational realization of the structural conditions for creativity.

Furthermore, the shift from outcome-oriented to process-oriented education,[9,33,47] along with Vygotsky's (1978) zone of proximal development and self-determination theory,[12,13] suggests that environments supporting iterative attempts and revisions function as structural conditions for fostering resilience by enabling AI to act as a cognitive partner that satisfies learners' needs for autonomy and competence.

B. Subcategory 4-2. Redefinition of the Teacher's Role

In generative AI-based music creation instruction, the teacher's role extends beyond simply guiding the use of technological tools and must be redefined as a facilitator connecting learners' emotional exploration and expression, a guide for reflection, and a designer who establishes an emotion-centered direction for instruction.

The role of the teacher as a facilitator connecting emotional exploration and expression beyond technical instruction was emphasized.

"Teachers should go beyond simply instructing how to use AI tools and instead support students in exploring their emotions and connecting them to music." (T.M.J)

"It is important to guide students to reflect on why they chose a particular piece of music and what emotions they intend to express." (K.S.H)

"It is important for teachers to set the direction of activities and expand students' thinking." (T.E.N)

Guiding students to articulate their intentions and choices was also identified as a core reflective role.

"Teachers should guide the class so that it becomes focused on emotional expression and reflection rather than technology-centered instruction." (M.K.T)

"The process of explaining one's own work and responding to others' works is particularly important." (T.M.J)

"It was impressive to see usually quiet students attempting to explain their results." (T.E.N)

The need to establish an instructional direction centered on emotional expression and reflection rather than technology was emphasized.

"Therefore, teachers must guide the class toward emotional expression and reflection rather than a technology-centered approach." (T.M.J)

"Music classes need to move beyond simple skill acquisition and be oriented toward providing opportunities for emotional release and expression." (P.M.K)

"Instruction should evolve to allow students to freely express their emotions and experience music in diverse ways." (T.E.N)

Music teachers are required to understand the characteristics and operational mechanisms of AI music generators and to possess the competence to select and apply tools aligned with achievement standards.[6] Kim (2023) and Moon and Seung (2022) emphasized that the teacher's role in AI environments expands and must function as a central component throughout the instructional process.[16,43]

From the perspective of creativity theories proposed by Torrance (1978) and Csikszentmihalyi (1996), the reflective process in which learners articulate their intentions and choices

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and share them with others serves as an educational mechanism that enhances the completeness of the creative process. Accordingly, shifting instructional direction from outcome-centered to emotion expression- and reflection-centered approaches is interpreted as a key principle for effectively integrating AI tools into educational contexts.[9,17,45]

C. Subcategory 4-3. Support Conditions for Field Implementation

For the generative AI-based healing music creation instructional model to be stably implemented in actual educational settings, it was confirmed that the establishment of equitable physical environments, systematic teacher training to enhance professional competencies, and the development of clear institutional guidelines regarding copyright and personal data must be integrated.

The establishment of a stable digital environment and equitable provision of devices across schools were identified as prerequisite conditions.

"First, a stable digital environment must be established, and training is needed so that teachers can fully understand and utilize AI tools." (T.M.J)

"Since digital device environments differ across schools, there may be difficulties in instructional implementation, and the burden of teacher preparation is not insignificant." (O.D.H)

"If the basic infrastructure is in place, I believe it can be sufficiently implemented. However, teacher training and resource support must accompany it." (L.J.W)

Systematic teacher training to enhance understanding and utilization of AI tools was also required.

"Training is necessary so that teachers can fully understand and utilize AI tools." (K.S.H)

"For technology-integrated instructional design, it is essential to establish collaborative systems with technical experts, and the importance of systematic support systems beyond simple tool provision is emphasized." (M.K.T)

The establishment of clear institutional standards regarding copyright and personal data was identified as an indispensable condition.

"Clear guidelines regarding copyright and personal data must be established to enable practical application without burden in real educational settings." (H.B.S)

"It is important to guide students to verify and specify the sources of audio and rhythm data they use … and to clearly document the music, data, and AI models used in their outputs or reports." (H.B.S)

"Clear standards regarding copyright and personal data must be established for practical use in educational settings." (T.E.N)

To implement AI-based music creation, it is necessary to comprehensively consider the establishment of digital-friendly educational environments, policy support, and the enhancement of teacher competencies.[38] To address inequalities in educational opportunities caused by disparities in access to AI tools, equal access to devices and software, along with the integration of offline-based creative activities, should be ensured.[22]

The OECD's emphasis on digital competency development as a key element in building a digital education ecosystem suggests that equitable device support across schools is a core condition for achieving educational equity.[5] Furthermore, systematic provision of teacher training and practical manuals related to AI composition and copyright,[16,22] as well as the establishment of contribution-based copyright evaluation systems,[23,25] are interpreted as essential conditions for ensuring the practical applicability of generative AI-based music creation instruction.

DISCUSSION

This study aimed to develop an instructional model for generative AI-based healing music creation education and to explore its practical implications through in-depth interviews with elementary and secondary school teachers and expert consultations. The findings were categorized into four major categories, and the key results can be summarized as follows.

First, current school music education was found to have structural limitations, including a singing- and appreciation-centered instructional structure, entry barriers due to prior knowledge requirements such as harmony and musical notation, and increasing disparities in learner participation. In particular, the emphasis on performance assessments and skill-based instruction limits opportunities for individual emotional expression. Learners with low musical confidence tend to avoid participation due to fear of failure, leading to repeated patterns of action paralysis. These findings suggest that current music education does not sufficiently realize its essential values—namely, learners' emotional growth and creative expression—and structurally support the need for new educational approaches.

Second, generative AI-based music creation instruction was found to produce three major educational effects: expansion of creative accessibility and enhancement of self-efficacy, facilitation of emotional expression and healing functions, and the development of resilience and a challenging attitude. Learners with limited musical background knowledge were able to produce creative outputs using generative AI tools, and these achievement experiences were found to contribute to the formation of self-efficacy. Additionally, the reflective process of expressing emotions through music and listening to them again

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enables learners to recognize their emotions from a distanced perspective, while environments allowing iterative revision reduce the burden of failure and promote resilience and willingness to retry.

Third, from the perspective of instructional implementation, generative AI-based music creation instruction demonstrated advantages such as increased student participation due to digital affinity, maintenance of instructional flow through rapid feedback on outputs, and enhanced flexibility through immediate observation of student responses by teachers. However, several concerns and limitations were also identified, including a lack of student awareness of authorship over AI-generated outputs, the risk of emotional expression being diluted due to excessive focus on tool usage, disparities in digital infrastructure across schools and the associated burden on teachers, and the absence of clear guidelines regarding copyright and personal data. These findings suggest that the introduction of generative AI tools alone does not guarantee educational effectiveness, and that instructional design and the teacher's role are critical variables in determining outcomes.

Fourth, for effective implementation of the instructional model, key structural elements include a staged process of emotional recognition → music generation → appreciation and reflection → sharing and feedback, process-oriented activity design rather than outcome-oriented approaches, and the provision of environments that support iterative attempts and revisions. Furthermore, the teacher's role must be redefined beyond guiding the use of AI tools to include functioning as a facilitator connecting emotional exploration and expression, a guide encouraging students to articulate their intentions and choices, and a designer establishing an instructional direction centered on emotional expression and reflection. For successful field implementation, prerequisite conditions include the establishment of stable digital environments and equitable device support across schools, systematic teacher training to enhance AI literacy and instructional competencies, and the development of clear institutional guidelines regarding copyright and personal data.

In conclusion, generative AI-based healing music creation instruction holds significant potential as an educational approach that complements the structural limitations of current music education while supporting learners' emotional growth and creative expression. However, its educational effectiveness can only be realized when systematic instructional design, redefinition of the teacher's role, and institutional and environmental support conditions are integrally implemented.

Implications for Future Research

This study has certain limitations in terms of the generalizability of its findings and quantitative validation, as it was conducted with one elementary and one secondary class in the metropolitan area, based on a four-week sample instruction and primarily analyzed through teacher interviews. Based on these limitations, the following suggestions for future research are proposed.

First, this study was conducted within a limited scope involving one elementary and one secondary class in the metropolitan area, and it did not extend to high school education. Future research should apply the instructional model across all school levels—elementary, middle, and high school—and across multiple classes and diverse regions to enhance external validity. In particular, comparative studies examining how differences in digital environments and learner characteristics across regions and school levels influence the effectiveness of the instructional model would not only improve its generalizability but also contribute to the development of tailored support strategies for field implementation.

Second, this study derived its findings based on short-term instruction limited to four sessions and on teacher observations and interviews, without quantitatively measuring or verifying changes in learners' self-efficacy, emotional expression, and resilience. Future research should employ a longitudinal design by fully implementing the 12-week instructional model proposed in this study, incorporating pre- and post-measurements. Quantitative validation should be conducted using instruments such as self-efficacy scales, emotional regulation scales, and musical interest scales to systematically accumulate empirical evidence regarding the educational effectiveness of the instructional model. This approach would align with studies such as Han and Han (2025),[13] which empirically verified the effects of parameter-based AI composition instruction through pre–post analysis, and could further contribute to statistically validating the effectiveness of the present instructional model.

Third, teachers participating in this study commonly identified challenges related to insufficient prior understanding of AI tools, limitations in instructional design competencies, and the absence of clear standards regarding copyright and personal data. Future research should therefore focus on systematically designing teacher professional development programs for the field implementation of generative AI-based music creation instruction and conducting action research that integrates these programs with the implementation of the instructional model. In particular, the development and evaluation of teacher training programs that include pedagogical approaches for AI tool utilization, emotion-centered instructional design, and practical guidelines for copyright and personal data management would serve as essential follow-up tasks to support the sustainable implementation of this instructional model in educational settings.

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CONFLICT OF INTEREST

The authors declare no competing interests.

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