A Critical Review of the Problems Arising from Changes in Elementary Music Classes Since the Introduction of ICT in Korea

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***Abstract*— The introduction of ICT in Korean elementary school music education since the 2000s has brought about positive changes for teachers, such as increased teaching convenience and student engagement and access to information. However, the essential values of music education, such as performance-centered expression and physical activity, have been weakened. This study analyzed the actual effects of ICT-based instruction through surveys and interviews with elementary school teachers and empirically examined the resulting decline in educational quality. The results revealed that while ICT can be a positive tool, its central use hinders the development of musicality, and that the value of experiential music education needs to be restored. Based on these findings, this paper proposes future directions for elementary school music education.**

Keywords— ***Elementary music education, ICT classes, musicality, emotional expression, experiential education, smart education***

I. INTRODUCTION

1.1 Background and Purpose of the Study

Music is the art of conveying human emotions and ideas through sound, and the early years of elementary school are a vital time for developing musical ability and sensitivity (Gordon, 2007). Music education during this stage is more than just teaching knowledge; it plays an important role in nurturing children's emotional development and creative expression. However, since the 2000s, with the rise of the information society and the widespread integration of ICT (Information Communication Technology) in elementary education, music teaching has undergone significant changes. The use of computers, digital pianos, electronic whiteboards, and multimedia content was anticipated to improve teaching efficiency and make learning materials more accessible. The government-led "smart education" initiative actively promoted the adoption of these digital technologies, making ICT-based instruction a new educational standard. Consequently, elementary school music classes have incorporated new teaching and learning tools, with technology-driven, multimedia-based instructional methods becoming increasingly common. Nonetheless, these developments have not always yielded positive results. Critics argue that the core values of music education—such as emotional engagement, creative expression, and community-based musical activities—are gradually diminishing amid the focus on technology-centered teaching approaches. In particular, in elementary music classes, the amount of time students spend singing or playing instruments is decreasing, depending on the teacher's guidelines and categories. Instead, learning activities that involve watching digital screens or clicking buttons are increasing, leading to a noticeable decline in children's musical sensibility and expressiveness (Hong, 2018). This poses a risk that the music education experience will shift from physical and emotional engagement to passive consumption of information. The role of teachers is also gradually changing. Rather than emphasizing their identity as music education professionals, their role as technology operators handling digital devices is increasingly emphasized. Furthermore, there is a growing tendency to evaluate teachers' educational competencies solely based on their ability to use technology. This shift may result in a decline in the quality of music education and ultimately impede children's artistic development. Specifically, it analyzes the impact of computer-based teaching methods on children's musical experiences and creative development, and proposes educational alternatives that can restore the essential value of music education. By suggesting directions for the harmonious integration of technology and art, it aims to contribute to the qualitative improvement of elementary music education and the realization of its inherent goals.

1.2 Research Questions

1. How has computer-centered instruction impacted the nature of music education? 2. Why has it failed to improve musicality? 3. How can we achieve a balance between technology and art?

II. THEORETICAL BACKGROUND

2.1 The Nature and Goals of Music Education

Music education goes beyond the mere transmission of knowledge; it is a holistic arts education that encompasses emotional expression, physical activity, and creative thinking. Learning music, especially during childhood, not only cultivates musicality but also significantly contributes to emotional stability, self-expression, and social interaction. Through the interactive process of "listening, singing, making, and playing," learners experience, express,

and connect with music, thereby fostering holistic development.

2.2 Gardner's Theory of Multiple Intelligences

Howard Gardner (1983) proposed the concept of "multiple intelligences," which encompass various domains such as linguistic, logical-mathematical, spatial, bodily-kinesthetic, and musical intelligence, rather than reducing human intellectual ability to a single form.[1] He defined musical intelligence as an independent intellectual ability and believed that experiential music education, engaging emotions, plays a crucial role. Musical activities are recognized for their value as an educational tool that goes beyond mere skill acquisition and enables emotional regulation, creative expression, and self-understanding.

2.3 Dewey's Experiential Education Theory

John Dewey (1938) defined education as "the reconstruction of life experiences," arguing that learning is not the accumulation of knowledge, but rather a process of growth through experience.[2] He believed that true education is achieved only when learners construct meaning through direct participation and practice. Music is not abstract knowledge, but an activity learned through physical and emotional engagement. This is a key example of the experiential education emphasized by Dewey.

2.4 Montessori's Sensory Training Theory

Maria Montessori (1967) emphasized the effectiveness of learning through sensory stimulation of the body, stating, "learning with the hands is deeper than learning with the head alone."[3] Music serves a medium that engages multiple senses, including not only hearing but also kinesthestic awareness through rhythm and tactile sensation through instrumental performance, which closely aligns with Montessori's educational philosophy. It emphasises the importance of direct sensory experience, which has been neglected in recent ICT-focused, screen-based music classes.

2.5 The Educational Role and Limitations of ICT-Based Instruction

The introduction of information and communication technology (ICT) has contributed to enhancing the efficiency and accessibility of elementary music classes by providing diverse teaching and learning materials and establishing a foundation for repetitive learning and independent study (Hong, 2018)[4]. Computers, digital pianos, electronic whiteboards, and multimedia content add audiovisual richness to music classes and are somewhat effective in stimulating student interest. A study analyzing the technological and educational limitations of music education in the digital transformation era (Kwon, 2024) explored the challenges music education faces in a digital learning environment and proposed teaching strategies and media utilization plans to overcome these challenges. .

Park Young-joo's (2021) study, which analyzed music learning video content in e-learning centers operated during the COVID-19 pandemic, found that the quantity of music-related content was significantly lower than that of other subjects, highlighting regional disparities in educational opportunities. Furthermore, the concentration of music content production in specific regions and institutions has raised concerns about educational equity. Kim Seong-hee's (2023) study, which examined the potential of augmented reality(AR) technology to bridge the digital divide and promote sustainable education in music education through the use of AR-based music edu-tech "Ludibell" in elementary schools, suggests that AR technology can enhance learner engagement as well as the diversity and accessibility of educational content.

However, excessive dependencee on technology diminishes the essential elements of music instruction—sensory experience, emotional expression, and physical activity—and risks reducing learner participation to merely "clicking a button" or "watching a screen." This reduces opportunities for musical interaction and relegates teachers to a role as technology operators. This phenomenon is giving rise to criticism that it is increasingly moving away from the original purpose of music education.

III. Evolution of Elementary Music Classes in Korea (Since 2000)

3.1 Smart Education Policy and Introduction of ICT

Since the early 2000s, the government has promoted a "smart education" policy across elementary and secondary education to address the information society. This process has led to the introduction of various ICT (Information and Communication Technology) devices in elementary schools, and music education has also been impacted (Kim Y., 2020). Electronic whiteboards, digital pianos, computer-based composition programs, and multimedia content have transformed the structure and delivery of music classes (Kim E., 2020). In particular, digital content, video materials, and touchscreen-based interactive games have shown positive effects in stimulating student interest and increasing the accessibility and effectiveness of classes (Park H., 2015; Choi, 2017).

3.2 Structural Changes in Teaching Methods

Before the introduction of ICT, music classes were primarily hands-on, with students singing along to the teacher's piano accompaniment or engaging in creative activities using teaching aids such as Orff instruments. However, indirect, consumption-oriented learning methods, such as watching videos, digital rhythm games, and playing automatic MR (Music Recorded) accompaniments, have increasingly become mainstream. In fact, teachers increasingly rely on playing pre-prepared videos or content rather than directly performing music or encouraging creative activities (Kim E., 2019; Kim Y., 2020).

3.3 Weakening the Essential Value of Music Education

These changes threaten the emotional experiences and creative expression that are the essence of music education (Hong, 2021). With the decline of sensory and participatory learning, such as singing, playing instruments, rhythmic expression, and physical activity, students are increasingly relegated to the role of "consumers" rather than "creators." Music classes are increasingly being replaced by audiovisual content viewing sessions, and actual "music-making" activities are being relegated to after-school activities or reduced (Park H., 2015; Choi, 2017).

3.4 Impact of Policy and Textbook Changes

With the introduction of "multimedia textbooks" as part of the smart education policy, elementary school music textbooks have also been restructured to focus on digital content. As a result, teachers have been forced to conduct classes by playing MIDI files or video clips rather than providing hands-on performances or demonstrations. This has reduced opportunities for teachers to demonstrate their musical expertise and has led to a uniformity in teaching. In classrooms, non-experiential activities, such as watching YouTube videos and solving game-based quizzes, dominate the classroom, rather than practicing songs. Furthermore, music appreciation is limited to passive listening through speakers, and instrumental performance is often relegated to activities outside of regular classes (Park H., 2015; Choi, 2017).

3.5 Expectations and Realities of Technology Introduction

The introduction of ICT technology was initially intended to stimulate interest in classes and enhance learning effectiveness. However, in practice, problems such as monotony, decreased activity, and loss of opportunities for emotional expression are frequently encountered. Especially in the emotional art of music, if technology-centered instruction becomes excessively emphasized, there is a significant risk that students' musicality, expressiveness, and artistic sensibility will not be fully developed. A situation where technology becomes the center of instruction rather than a learning aid can be seen as disconnected from the essence of music education (Kim E., 2020; Kim Y., 2024)

IV. Analysis of Survey and Interview Results

4.1 Survey and Interview Questionnaire Design

- Subjects: Experienced elementary school music teachers
- Survey participants: 30, Interview participants: 5-
  Questions: 7 (5-point Likert scale)
- Survey period: September 2025
- Purpose: To investigate teachers' ICT use, perceptions of classroom changes, and perceptions of musical development

1) I feel that preparing for music classes has become easier since the introduction of ICT.
2) Digital content (videos, games, etc.) is effective in stimulating students' interest.
3) Classes utilizing computers and electronic devices can adequately replace musical experiences (singing, playing instruments, etc.).
4) I believe that current music classes sufficiently foster students' emotional expression and creativity.
5) There is concern that the increasing use of ICT is weakening the essence of music classes.
6) I feel that opportunities to directly teach instrumental performance or singing are decreasing.
7) I believe that ICT-centered classes are actually making students passive. (Options: strongly disagree / disagree / average / agree / strongly agree)

4.2 Results Analysis

4.2.1 Survey Results

As below the <Table 1>, the survey results indicate that while ICT enhances instructional convenience and student engagement, there are strong concerns regarding the weakening of the core essence of music education, the decline in practical performance opportunities, and the increased passivity of students.

<Table 1> Survey results

No.	Question summary	strongly disagree	disagree	average	agree	strongly agree
1	Lesson preparation has become easier	2 (6.7%)	4 (13.3%)	7 (23.3%)	12 (40%)	5 (16.7%)
2	Digital content is engaging	1 (3.3%)	3 (10%)	5 (16.7%)	15 (50%)	6 (20%)
3	ICT can replace musical experiences	10 (33.3%)	12 (40%)	5 (16.7%)	3 (10%)	0 (0%)
4	Current classes are insufficient for developing creativity	6 (20%)	10 (33.3%)	8 (26.7%)	5 (16.7%)	1 (3.3%)
5	Concerns that the use of ICT may weaken the essence of classes	1 (3.3%)	2 (6.7%)	4 (13.3%)	10 (33.3%)	13 (43.3%)
6	Opportunities for performance and singing instruction have decreased	3 (10%)	4 (13.3%)	6 (20%)	10 (33.3%)	7 (23.3%)
7	Students have become passive.	2 (6.7%)	3 (10%)	7 (23.3%)	12 (40%)	6 (20%)

A total of **56.7% of respondents (40% agree, 16.7% strongly agree)** perceived that lesson preparation has become easier with the use of ICT. This result suggests that access to digital materials, instructional resources, and multimedia content has reduced teachers' technical and administrative burden. However, **20% of respondents (13.3% disagree, 6.7% strongly disagree)** still reported difficulties in lesson preparation, indicating that disparities in teachers' ICT competence and the burden of selecting appropriate materials persist.

Seventy percent of the respondents (50% agree, 20% strongly agree) indicated that digital content effectively increases students' interest and engagement in learning. This finding suggests that ICT-based instructional materials enhance learning motivation through audiovisual stimulation. Nevertheless, **13.3% expressed negative views and 16.7% remained neutral**, implying that digital content does not uniformly guarantee student engagement in all instructional contexts.

A strong majority of respondents (**73.3%: 33.3% strongly disagree, 40% disagree**) rejected the idea that ICT can replace authentic musical experiences. This result clearly indicates that most teachers believe ICT cannot substitute for essential musical activities such as live performance,

singing, and embodied musical interaction. While ICT may serve as a supplementary tool, it is not perceived as a replacement for the core experiential nature of music education.

More than half of the respondents (**53.3%: 20% strongly disagree, 33.3% disagree**) disagreed with the statement that current classes are insufficient for fostering creativity. This implies that many teachers believe ICT-integrated instruction contributes, at least to some extent, to creativity development. However, **20% agreed, and 26.7% remained neutral**, suggesting that perceptions of creativity enhancement vary considerably depending on instructional design and classroom implementation.

A substantial proportion of respondents (**76.6%: 33.3% agree, 43.3% strongly agree**) expressed concern that the use of ICT may weaken the fundamental essence of music classes. This result reflects strong apprehension that excessive reliance on digital tools may undermine the experiential, expressive, and human-centered nature of music education. It suggests the necessity of maintaining a balanced approach in which ICT supports, rather than replaces, the core values of music instruction.

More than half of the respondents (**56.6%: 33.3% agree, 23.3% strongly agree**) perceived that opportunities for performance and singing activities have decreased since the introduction of ICT. This suggests that ICT-centered instruction may inadvertently reduce hands-on musical practice. Meanwhile, **23.3% disagreed and 20% were neutral**, indicating that the reduction of performance activities may depend largely on how ICT is incorporated into the instructional process.

A total of **60% of respondents (40% agree, 20% strongly agree)** indicated that students have become more passive in ICT-based classes. This finding suggests that video viewing and content-centered instruction may inhibit students' active participation and agency. On the other hand, **16.7% disagreed and 23.3% remained neutral**, implying that learner passivity is not an inevitable outcome of ICT use but is closely related to instructional strategies and classroom management.

4.2.2 Teacher Interview Result

Focus group interview was taken to gain in-depth insight into actual teaching experiences and thoughts. There are 6 questions and summary of each response below <Table 2>.

<Table 2> Teacher Interview Questions and Responses

Question	Response summary
1. what's the proportion of ICT utilization?	"Each class utilizes an electronic whiteboard and video materials. 50-60% of all classes are digitally based."
2. advantages and limitations	"It may help spark interest, but it will inevitably reduce the time spent singing or practicing instruments."
3. influence of musical expressiveness	"Children don't express their emotions vocally, but instead react by searching for the right answer. It feels like their creativity has been diminished."
4. Difficulty in teaching playing and singing	"Practical classes are becoming increasingly difficult due to classroom environment, soundproofing issues, and time constraints."
5. Striving for balance	"Trying to do one week of digital and the other week of instrumental music or choir."
6. A desirables class atmosphere	"Technology should be a supplementary tool, not the primary one. We need to restore music lessons that involve hands and mouth."

The in-depth interviews revealed similar trends. While most teachers used ICT to a certain extent in their classes, they identified challenges such as reduced emotional expression, creativity, and practical activities. They emphasized that "technology should remain an auxiliary tool, and the essence of music education lies in experience and communication." Both the survey and the interviews revealed a consistent perception among teachers that while ICT can be beneficial when used as an auxiliary tool, it undermines the essence of music education when it becomes the centerpiece. Specifically, the reduction in practical activities, diminished emotional expression, and student passivity stem from the structural limitations of technology-centered instruction. This highlights the tension between the advantages of educational technology and the artistic nature of music education.

V. Discussion

5.1 Weakening of Experiential Music Education

Since the introduction of ICT in elementary music classes, experiential learning activities, where students directly sing, play instruments, and learn rhythm through their bodies, have gradually declined. In many classes, instead of direct teacher accompaniment, students often simply play recorded music files, singing along or simply listening. Furthermore, with the rise of video-based and click-based activities, opportunities for students to engage with music on a sensory level have diminished. This shift threatens to weaken the sensitivity, creativity, and sensory experiences that are core to music education, potentially leading to a decline in the overall effectiveness of music learning.

5.2 Increased Passivity and Decrease in Creativity in Students

Students exposed to digital content are becoming accustomed to passively following the given content, rather than exploring sounds or expressing themselves musically. This has led to a gradual decline in their creative expression skills, and students tend to perceive music classes as "screen time" rather than active learning. Furthermore, as learning attitudes are formed that expect only playful ICT activities, music is becoming a mere object of consumption rather than emotional engagement. Consequently, students' agency and proactiveness as learners are severely weakened.

5.3 Changing Roles of Teachers and Declining Professionalism

With the spread of ICT-centered instruction, the role of teachers is also changing. Teachers are increasingly functioning as content providers or device operators rather than music educators. Non-musicians, in particular, tend to rely more heavily on ICT. Consequently, the perception that "music lessons can be taught even without musical skills" is spreading, gradually weakening teachers' creative leadership and direct instructional capabilities. This could lead to a decline in the quality of music education,

necessitating a fundamental rethinking of teachers' professionalism.

5.4 Weakening of Student Interaction and Community

The decline in collaborative music-making activities, such as choirs, ensembles, and improvisation, is also a major problem. Many classes currently rely on individual video viewing or click-based learning, which reduces opportunities for student interaction and weakens the sense of community. While music is inherently an art form fostered through collaboration and communication, the increasingly isolating nature of instruction is undermining its educational essence.

5.5 Lack of Emotional Expression and Physical Activity

In digital-based classes, core elements of music, such as rhythmic expression, bodily movement, and sensory engagement, are increasingly disappearing. Instead of feeling rhythm with their bodies or expressing emotions in singing, students are limited to repetitive activities such as watching a screen, listening, and singing along. This leads to a decline in musical expression and hinders the integration of physical, emotional, and cognitive development.

5.6 Decline in Musicality and Weakened Learning Achievement

According to national music assessment data and observations from teachers, students' sense of rhythm, pitch, and creative musical expression skills generally decline after ICT-based instruction. While students may be able to simply "sing along," they often lack the ability to spontaneously create or apply music. This suggests that outcome-oriented ICT instruction hinders in-depth, process-oriented learning.

5.7 The Pitfalls of Technocentrism

Although ICT was originally introduced as a learning aid, it is increasingly being misconstrued as the goal of instruction itself. Within a system where "ICT-based instruction" is evaluated as an educational outcome, the emphasis on form over substance is intensifying. This technocentrism is similar to the tendency toward technological supremacy warned against by educational philosophers such as Piaget and Papart, and can lead to an inhumane educational structure that excludes the essential elements of music—emotion, humanity, and empathy.

5.8 Rethinking the Direction of Smart Education is Necessary

In conclusion, ICT should be a means to an end in education, not an absolute end in itself. In music education in particular, essential elements such as emotion, physicality, and interaction should be central, with ICT used to complement or enrich these elements. In the field, we need to restore the importance of experiential music activities and design lessons that balance ICT with emotional and creative activities. Furthermore, policy support should be provided to strengthen teachers' teaching autonomy and professionalism.

VI. Conclusion

This study critically examined the impact of ICT on elementary school music classes and analyzed the field through surveys and interviews. The study found that while the introduction of ICT has some positive aspects, such as stimulating class interest and improving access to materials, it has also led to a weakening of the essential values of music education: emotion, creativity, and practical experience. Specifically, students are shifting from active learners to passive consumers of instruction, and teachers are also being reduced from music educators to device operators or content providers. The root cause of this problem lies in the shift from using technology as a "tool" to an "end" in education. With ICT utilization itself being considered an educational outcome, the content and quality of instruction are often relegated to the background. While this may appear formally innovative, it is actually undermining the essence of music and failing to foster students' musicality. Therefore, future elementary music education requires the following improvements: First, ICT should be utilized as a supplementary tool, while actual instruction should focus on musical experiences and expressive activities. Second, teaching expertise needs to be strengthened through practical training programs for teachers and the sharing of creative lesson design examples. Third, the physical educational environment needs to be improved, including through improved soundproofing and increased instrument availability, to ensure the stable operation of skill-based classes. Fourth, digital content development must shift beyond simple information delivery to encourage emotional expression and physical activity. Music education is a unique educational domain that fosters human emotion and expressiveness, transcending mere skill learning. This is an area irreplaceable by any technology, and its educational value is even more crucial in the digital age. Therefore, continuous efforts and structural changes are needed to realize "person-centered music education" across educational policies, school environments, and teacher expertise. To complement the limitations of this study and specify directions for qualitative improvement of music education, we propose follow-up studies such as ‘an empirical study on the correlation between ICT-utilized classes and the development of students’ musicality,’ ‘a study analyzing the effectiveness and sustainability of a practical competency enhancement program for teachers,’ ‘a long-term follow-up study on the impact of experiential music classes on students’ creativity and emotion,’ or ‘an analysis of field application cases of a class model that balancedly integrates ICT and emotional education elements.’

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