Systematic Integration of 4C Skills in Music Education in the 21st Century

Bao Naixue[1*]
Faculty of Creative Arts, Universiti Malaya

Yi-Li Chang[2]
Faculty of Creative Arts, Universiti Malaya

Cheong Ku Wing[3]
Institute of Music, UCSI University, Malaysia
*First and corresponding author
(baonaixuesq1007@163.com, yilichang@um.edu.my,
cheongkw@ucsiuniversity.edu.my)

Abstract

21st-century skills are critical for China and the world today. This study examines the development of the 4C skills—critical thinking, creativity, communication, and collaboration—in music education. Through an extensive search of music education-related materials, special attention was given to the effectiveness and value of the current music education system and its reform programs and implementation. In the context of education, the 4C skills of the 21st century are recognized as key factors in students' future workplace success. This study focuses on an in-depth examination of methods for integrating 4C skills theory with music practice. The analysis revealed that the current research methodology in music education is too homogeneous, especially regarding the integration of music education with the 4C skills of the 21st century, with most studies biased towards exploring a single skill. However, this study emphasizes the importance of integrating critical thinking, creativity, communication, and collaboration into music education, demonstrating that the integration of these skills can significantly improve students' musical literacy, promote the overall development of their basic competencies, and highlight the critical role of arts education in students' overall educational experience. Methodologically, this study adopts a systematic approach to sort out and analyze research related to the development of 4C skills in music education in the 21st century, focusing mainly on descriptive analysis. This approach reflects the current status and value of music education reform and lays the foundation for future development. The final findings show that by systematically analyzing studies related to 4C skills

in music education in the 21st century, these skills can not only significantly improve students' musical literacy and performance ability but also effectively promote the progress of music education. Additionally, the study emphasizes the importance of arts education for students' overall development, providing useful insights for future music education reform and practice.

Keywords: 21st century 4C skills -- critical thinking, creativity, communication, collaboration, music education

Introduction

In recent decades, the world has been changing dramatically due to advanced technology and means of communication, rapid economic development and fierce competition, sweeping changes, and increasing global challenges, such as the financial crisis and the COVID-19 pandemic. These changes are invariably a cautionary tale, emphasizing the need to be well-equipped to deal with them. Today's society has entered the 21st century, and it is important to be proficient in new skills, both at work and school, to keep up with the changes. Akcanca and Nur (2020) emphasize that to face sudden challenges, individuals must have a set of skills known as 21st-century skills. These skills will allow them to survive in an unpredictable world and safely enter the future or "survive" (Kocak & Goksu, 2020). The four essential elements of 21st-century learning and innovation skills are critical thinking, creative thinking, collaboration, and communication (Schleicher, 2011). Wagner (2008) describes seven survival skills for careers that all students need to learn continuously for citizenship in the 21st century: critical thinking and problem-solving skills, collaboration and critical impact, flexibility and adaptability, initiative and entrepreneurship, effective oral and written communication, accessing and analyzing information, and curiosity and imagination. Instructional strategies will always be innovative and change in response to how 21st-century learners learn and other factors that influence the learning environment. Therefore, school administrators and teachers must use innovative skills that are appropriate for the needs of 21st-century learners to better develop their educational careers. In today's knowledge age, education has become critical.

Voogt, Erstad, Dede, and Mishra (2013) suggest that the development of student skills in the 21st century requires the identification of new pedagogical and content-based educational goals. To adapt to 21st-century skills, Enrico, Riconalla, Adelfa, and Silor (2017) argue that the role of music pedagogy should be integrated with other disciplines to promote learning activities through cultural responsiveness. This optimal combined approach to the curriculum ensures that learning is no longer conducted in a single discipline. The integration of disciplines will be more effective in facilitating skill development. Balls, Eury, and King (2011) propose that a 21st-century curriculum will be interdisciplinary, project-based, and incorporate multiple intelligences and authentic assessment. Thus, instruction and assessment of 21st-century skills will be innovatively incorporated into the school curriculum. Koenig (2011) argues that assessments are needed to evaluate student performance in 21st-century skills. Moreover, Maneen (2016) adds that helpful feedback from teachers on student performance should be incorporated into daily learning to measure students' mastery of 21st-century skills. Beswick and Fraser (2019) similarly argue that adequate and competent teaching of the concepts of 21st-century skills is necessary. Student learning will develop a deep understanding of conceptual theory combined with practical application.

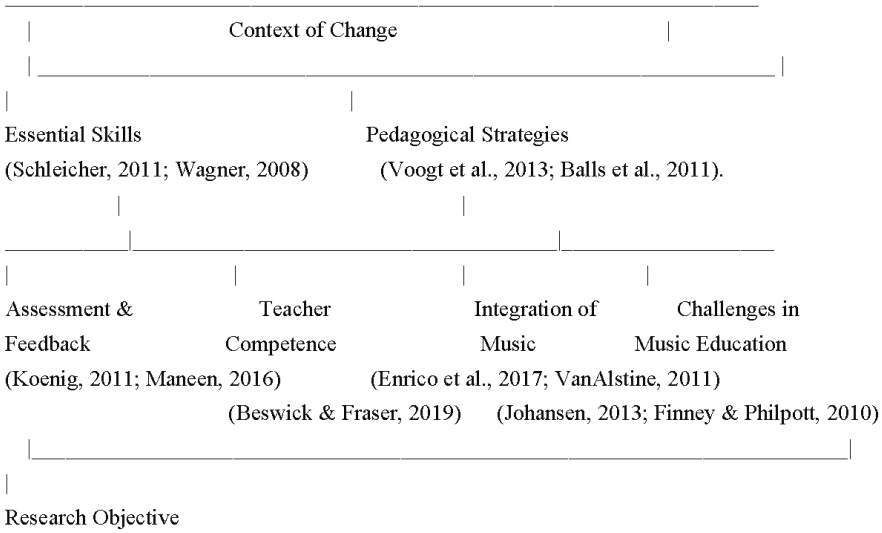

Figure 1 The relationship between music education and 21st century skills development

Figure 1 shows the key elements and changing context in music education in the 21st century, which are mainly divided into two parts: Essential Skills and Pedagogical Strategies. Essential Skills include critical thinking, creative thinking, collaboration, and communication, while Pedagogical Strategies emphasize innovative methods. The figure also points out four important areas: assessment and feedback, teacher ability, music integration, and challenges in music education, and cites relevant literature to support these elements. These elements together form the core of this study, which aims to identify and analyze relevant research on the development of 4C skills in 21st-century music education through a systematic approach and descriptive analysis.

Integrating music and cultural knowledge in a globalized curriculum system is considered a musical and cultural approach to teaching and learning (Enrico, Riconalla, Adelfa, & Silor, 2017). VanAlstine's (2011) research supports the idea that teacher education programs in higher education require the application of music pedagogy for the global curriculum of the 21st century. Music is an essential element of human nature and should be a fundamental subject in the school curriculum;

music can motivate students and transform passive learners into active participants. Johansen (2013) argues that music education faces a wide range of challenges in this day and age and cannot be separated from the developments and changes of globalization. "Living" and "tapping into" music learning as part of a meta-pedagogy of teacher education is most likely to influence the development of music teachers' habits, which will influence students' non-alienated learning. Promoting learning activities within the classroom contributes to a positive learning environment (Finney & Philpott, 2010).

Research Objective

The purpose of the study is to explore and explain the relationship between 4C skills—critical thinking, creativity, communication, and collaboration—in music education and students' future career success. It aims to propose and analyze methods for integrating these skills into music education practices, emphasizing their importance in fostering students' musical literacy and overall competency development, and highlighting the crucial role of arts education in the holistic educational experience. The study seeks to comprehensively analyze the application of 21st-century 4C skills in music education and their impact on enhancing students' musical literacy.

Research Question

In the context of existing research and practice, how can music education in the 21st century be evaluated and quantified in enriching the overall educational experience of students by emphasizing and practicing arts education, particularly the development of the 4C skills?

Methods

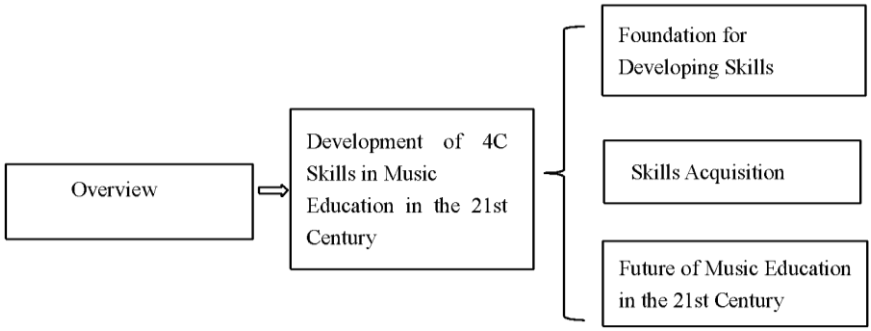

Figure 2 Literature review method content

This study adopts a systematic approach with descriptive analysis to identify and analyze relevant research on the development of 4C skills in music education in the 21st century. The systematic approach includes defining the research question, systematically collecting and organizing related literature, and classifying and summarizing using literature analysis methods. The descriptive analysis represents the current status and value of music education reform. Numerous analyses, case studies, and trends in music education reform provide a foundation for today's 21st-century skill acquisition and future development in music education. However, being primarily descriptive research, more support is needed to draw conclusions about substantive outcomes. Recent descriptive studies are more relevant to the conclusions of today's times. The rest of the article's descriptive research does not impose on the theory-based literature.

Literature Review

Music and Music Education

Recent studies have shown that music and music education play an important role in the development of students. Music education not only enhances students' cognitive abilities but also promotes academic achievement and social-emotional development. Studies have shown that learning music significantly enhances students' higher-order thinking skills, such as analyzing, reasoning, and problem-solving, as well as their

spatial-temporal abilities, which is especially important in subjects such as math and engineering (Bergee & Weingarten, 2020). Additionally, students who participate in music programs perform better in math and reading scores and have higher overall GPAs (University of Kansas, 2020).

Music education also has a significant positive impact on students' emotional intelligence and social skills. Williams' (2020) study found that students who participated in music ensembles performed better in collaboration and communication, which led to the development of stronger interpersonal skills. Greenberg et al. (2020) noted that music education helps students better understand and express emotions, boosting their emotional intelligence.

Despite the many benefits of music education, there are still some challenges, such as underfunding, lack of resources, and lack of student voice in the decision-making process (Henley & Barton, 2020). To address these issues, there is a need to increase investment in music education and to work with parents, educators, and policymakers to raise awareness of the importance of music education.

In summary, music education plays a crucial role in promoting the holistic development of students. By overcoming existing challenges and ensuring that more students are able to benefit from music education, a solid foundation can be laid for their holistic development and future success.

Critical Thinking

Critical thinking remains a cornerstone of educational practice. Although research on critical thinking in music education began in the 1980s, it has been little explored in the music classroom. According to Abramo and Reynolds (2015), critical thinking skills enable students to assess and reflect on the quality of their musical performances and develop strategies for improvement. This is consistent with Biasutti and Concina's (2018) assertion that critical thinking is essential for the development of autonomous musical competence. The task of defining critical thinking consistently across the vast educational research literature is daunting (Lai, 2011). However, integrating critical thinking into the curriculum has become a central goal of education in the U.S. Facione (2015) argues that while teaching critical thinking is challenging, once mastered, it is critical

to future success. Robinson (2017) emphasizes that education is most impactful when it is relevant to the student's experience. Similarly, Schleicher (2018) argues that the essence of critical thinking lies in the application of knowledge during the learning process rather than waiting for complete mastery of content. Effective student-teacher interactions play a crucial role in academic performance and the development of critical thinking skills. Huber and Kuncel (2016) argued that assessing student performance thinking through interviews or written reflections on students' perceptions of their learning is more effective than direct observation, thus promoting greater student autonomy in learning.

Brown and Benedict (2019) point out that critical thinking is crucial for developing one's understanding and perception of music. This aligns coherently with Collins and Durant (2021): student musicians actively develop their musical skills when they make musical decisions through critical listening. In other words, critical thinking not only improves the understanding of music but also directly influences the music decision-making process, making students more skilled and sharp in practice. Davis and Kruse (2020) state that critical thinking skills in music can be enhanced by immersing oneself in musical experiences that deepen the understanding of musical fundamentals. Foster (2022) states that when teachers act as conductors of musical ensembles, they should provide students with insight into the critical thinking process used by the conductor in interpreting any given piece of music, rather than merely performing the actions of conducting. This process and approach allow the music to be performed uniquely. Martinez and Smith (2020) argue that when students understand the role of different musical works in different cultures and ideologies, their critical thinking skills are enhanced when interpreting the integrity of musical interpretation, allowing them to consider multiple factors in their critical thinking experience. Martinez and Smith also explain that students' understanding of cultural and gender diversity, different musical styles such as classical, jazz, pop, and world music, class background, and race all impact students' critical thinking as these factors influence their understanding of musical challenges. Nguyen (2021) argues that, according to the pop music approach, representing the cultural identities of different countries requires critical thinking to identify the unique and innovative creative output of the structure of popular music.

However, Reynolds (2018) believes that not all music teaching can cultivate students' critical thinking, and music lessons need to be designed purposefully to encourage students to think critically. Knowledge plays a key role in this process. First, a background in music theory, history, and culture can help students better analyze and understand musical works. Second, through critical listening and actual playing, students can apply theoretical knowledge to practice, thereby enhancing their musical skills and critical thinking abilities (Bergee & Weingarten, 2020). Therefore, knowledge is not only the basis for critical thinking but also promotes the overall development of students through specific instructional design and practical activities.

Creativity

Wai Chen (2017) similarly observes that musical creativity has been considered an essential topic in music education for the past several decades. The alignment of 21st-century skills with music education is reflected in the NCCAS definition of the artistic process "creativity," which refers to "producing original art" (National Core Arts Standards, 2014, p. 11). This original art allows students to develop innovative thinking that can reflect the diverse nature of music from various perspectives. Creative thinking skills not only help students innovate and develop new ideas and approaches but also provide them with creative ways to address performance challenges, especially in areas such as emphasizing students' overall creativity and appreciation of contemporary music. These skills also enable students who independently compose and perform music to become effective creative thinkers (Mark, 1996; Priest, 2002; Shuler, 2011).

The placement of "creativity" at the top of the new classification suggests that students engaged in musical composition (improvisation, composition) are functioning at the highest levels of musical thinking. This change makes sense (Shuler, 2011). Creating music requires combining all the musical skills and concepts learned to express something new. Students infuse this ability to create new ideas into the group, which helps to increase musical innovation. Creativity is a socially and culturally mediated practice built on the general creativity research tradition that defines "musical creativity" in phenomenological, psychological, and ethical terms. Burnard (2012) also agrees that musical creativity is indeed culturally, socially, and historically contextualized. While creativity

necessarily takes into account the needs of the audience within the context of established and different cultural practices, it is essential that educated people be able to self-perpetuate and creatively engage with new environments. Maloney (1992) further argues that educational leaders and educators are responsible for creating an atmosphere that encourages creativity and self-discovery. Creative thinking in music is a way for the brain to actively think about sound to produce an innovative musical product (Webster, 2002). This leads to musical independence.

In a survey of ways to improve students' creative thinking, Strom and Strom (2002) found that teachers continue to play an essential role in fostering student creativity as the development of creative thinking skills is rapidly gaining popularity worldwide. Music performance is one area where the human need for constant stimulation can be met. Blocher, Greenwood, and Shellhammer (1997) also evaluated the teaching behavior of 21 middle and high school band directors and concluded that teacher behavior directly influences how students learn, the extent to which they use creative thinking, and 21st-century learning skills. Woody (2002) found a creative approach to music education that sought to express the influence on the acquisition of musical performance skills through emotion, imagery, and metaphor. He indicated that using imagery and metaphor to stimulate the creative imagination of music performers is an effective educational tool. Schools must help students creatively face the evolving world. Webster (2002) suggests that developing students' creative thinking skills in music must be at the core of the professional activities provided by music educators.

Creative thinking in music is about the brain actively thinking about sound to produce an innovative musical product (Webster, 2002). This leads to musical independence. Music educators need to emphasize teaching creative thinking skills, especially in musical expression (Allsup, 2012; Blocher et al., 1997; Byo, 1990; Karlsson & Juslin, 2008; Kratus, 1990; Molnar, 2005; Priest, 2002). Creative thinking skills provide students with new ways to solve ideas and performance challenges (Evenhouse, 2014b; Mark, 1996; Shuler, 2011). Creative thinking skills are more critical in developing the foundation for students' musical expression and imagination.

Communication

First, Xue Wang (2023) raises an important question: "Do students choose silence, or does silence control them?" (p. 126). To meet the expectations of 21st-century education, educators strive to improve their communication skills. Interpersonal communication in the teacher-student relationship permeates all aspects of teaching and learning. Blazar (2021) proposed a model of "teaching as interpersonal competence" and attempted to summarize the communication skills necessary for the teaching process.

In a musical team, information can also be exchanged nonverbally. Marcus (2021) studied the communication of two professional pianists during a performance. They found that, except for a small portion of the time when the two pianists communicated verbally, most of the communication during a performance or rehearsal was nonverbal, mainly in gestures, eyes, and expressions. To build understanding and save time, most of the group's communication was nonverbal.

Although music is a universal language, not all people respond universally to it. Music as a communication tool is still a powerful way to facilitate communication between people. It can influence the context of the communication process through "musical performances and cultural performances" (Bennett, 2020). Music can help people better understand the fundamentals of communication and the function of language, ultimately helping them use all available communication tools more effectively (Lemov, 2021).

Collaboration

In the last decade, due to the rise of globalization and technology, the ability to collaborate effectively has gone from being essential for students and professionals to a vital requirement (P21, 2015). Collaboration alone is not the work of one person; it is a mode of work and learning in which multiple people work together, linking individual strengths into collective strengths. So, collaboration means teamwork (Dillenbourg, Baker, Blaye, & O'Malley, 1996). The core of collaboration is that participants work together to accomplish the same task rather than working in isolation, and the compromises necessary to reach a common goal should be made. The quality of interactive communication can directly affect the thinking of

other participating members. The development of social and collaborative skills is primarily seen as a natural occurrence that does not require further facilitation, given the pervasiveness of collaboration in everyday life. From a music education perspective, the development of collaborative skills among students has been of great interest since integrating music ensembles on campuses. Of course, the perception of collaborative skills varies across many schools. Lisk (2010) argues that teams are the most collaborative functioning groups. Students most readily experience the importance of collaborative skills in a school setting through the learning exercises of music ensembles (Evenhouse, 2014b).

A quantitative study by Kinney (2004) comparing high school students' ensemble and performance approaches, assessed by performing similar musical pieces, found that students with ensemble experience were more musically expressive than those in the performance-only format. It was also found that students with experience in ensemble playing were more musically expressive than those who played alone and knew how to work better as a group to enrich the musical expression and make the piece more complete. Based on the findings of this experiment, a subsequent study by Molnar (2005), although the purpose of the study was to examine the importance of the Lisk method for students' collaborative learning, used the same method to compare the force groups of middle school band performances by playing the same musical pieces, with one group using the traditional rehearsal technique and the other group using the Lisk technique. The students using the Lisk method used a more collaborative listening approach than the students using the traditional method in order to make a better expression of the musical piece.

Research in recent years has shown that the way successful music ensembles divide roles and interact in their collaborations is critical to their performance. Harrison and Ritchie's (2017) study found that music ensemble members take on different roles during rehearsals, actively communicate to resolve disagreements, and hold each other accountable for their collaborative compositions. These types of collaborative patterns have become the most common behavioral norms for musicians.

According to Evans and Morrison (2020), when examining collaboration in musical ensembles, participants should continually reflect on what has been created in rehearsals, developing, testing, and modifying new ideas to enhance the overall performance. Additionally, Bennett and

Freer (2019) stated that it is crucial to create an environment that encourages individual responsibility and shared leadership.

Smith and Jones (2018) documented high school students' interactions during chamber music rehearsals and drew interpretive conclusions through collaboration. This type of interaction between students not only accomplished musical interpretation but ultimately enhanced their academic performance in all disciplines.

Although there is no substantial development of collaborative skills, the research results, as described above, indicate that students can perform in musical ensembles unaware of their ability to collaborate autonomously and naturally. Thus, music ensembles are one of the most powerful ways to provide students with practical learning in a collaborative and creative environment (Sawyer, 2008).

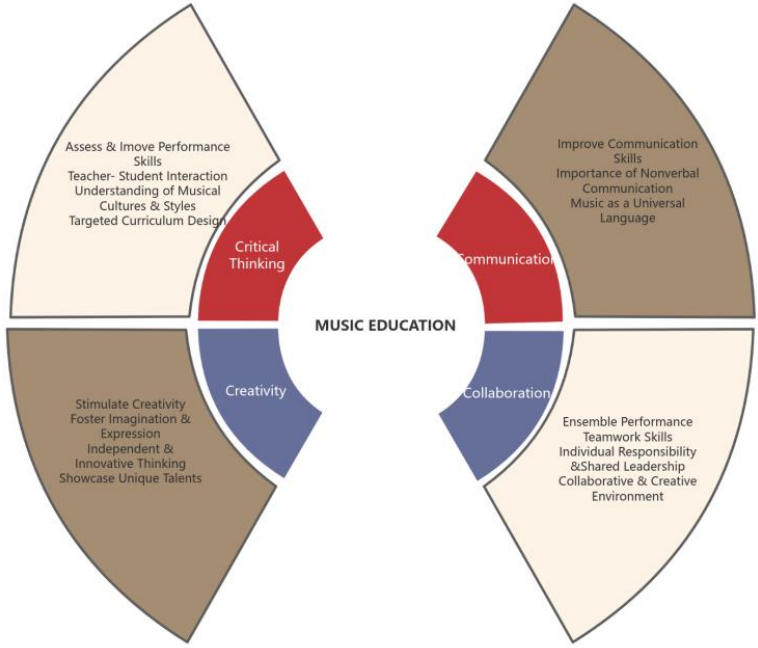

Figure 3 Music education and 4C skills

The Role of Music Education in Enhancing 21st Century Skills

In modern education, music education is not only an art subject but also an important way to cultivate students' comprehensive abilities. Recent studies have shown that music education can significantly improve students' critical thinking, creativity, communication, and collaboration skills (Augereau-Landais et al., 2023). Critical thinking is particularly important in music education as it helps students improve their level of musical performance and appreciation by analyzing and understanding musical compositions (Kokkidou, 2022). In the process of music learning, students need to constantly evaluate and reflect on their playing skills and musical understanding, which helps to develop their independent thinking abilities.

Creativity is one of the core elements of music education. Through activities such as composition and improvisation, students are able to stimulate their creative potential and explore and express new musical ideas and methods (Chen, 2019). This creative activity not only cultivates students' innovative thinking but also enhances their understanding and appreciation of musical diversity (Concina, 2023).

Communication skills are also important in music education. Through participation in ensembles and group performances, students learn how to communicate effectively with others non-verbally, such as through gestures and eye contact. This skill is essential for coordinating and improving collective musical performances (Janine, 2024).

In addition, collaboration skills are integral in music education, where students work together to achieve the best performance of musical compositions through teamwork. This not only cultivates their teamwork spirit but also enhances their leadership skills (Moshtagh et al., 2021).

A Systematic Approach

This study adopted a systematic approach with descriptive analysis to identify and analyze relevant research on 4C skill development in music education in the 21st century. The systematic approach includes defining the research question, systematically collecting and organizing related literature, and using literature analysis methods to classify and summarize. As defined by Smith (2020) and Johnson (2019), descriptive research involves detailed observation and analysis of phenomena to provide a

comprehensive understanding. This study systematically describes and summarizes the existing literature, with a particular focus on research on the development of 4C skills in music education in the 21st century.

For example, Lee (2021) examined the development of critical thinking in music education and found that descriptive analyses led to a better understanding of the effectiveness of teaching methods. Jones (2022) noted that the development of creative thinking in music education needs to be based on detailed observations and analyses, and that these descriptive studies help to shed light on the current status and value of educational reforms. Wang (2023), in turn, has emphasized the importance of collaborative skills in music education, and the collection and analysis of relevant data through a systematic approach allows for a more comprehensive description of current educational practices.

The comprehensiveness and reliability of the study were ensured by analyzing and organizing the relevant research findings in detail. Oare (2012) stated that in order to promote student autonomy and responsibility in the future of learning education, 21st-century learning skills become a necessary part of students' journey toward success. Schleicher (2011) listed four essential elements of 21st-century learning skills: critical thinking, creative thinking, collaboration, and communication. Based on the literature review, a systematic analysis and descriptive statistics were conducted. These methods strictly followed the standards of descriptive research and provided a solid guarantee for the credibility of the findings.

Research Analysis

In the 21st-century education system, critical thinking, creativity, communication, and collaboration are seen as vital competencies. These skills not only play a key role in general education but also have a profound impact on music education. Critical thinking involves assessing, analyzing, and synthesizing information to help students make rational decisions (Kolk, 2022; Trilling & Fadel, 2009). Creativity refers not only to generating novel and useful ideas but also to the ability to adapt and apply those ideas (Pollard, 2012; Smith, 2005). Effective communication skills help students express and share ideas and understand the perspectives of others. A technology-rich environment in the classroom helps students achieve communication goals through a variety of mediums (Dana-Picard & Hershkovitz, 2020). Collaboration skills emphasize

teamwork and encourage students to work together to achieve a common goal (Erdoğan, 2019; Moshtagh et al., 2021).

These skills complement each other; for example, effective collaboration requires communication skills, while critical thinking helps to analyze and evaluate different perspectives in a team. In addition, creativity is often stimulated in collaborative processes, resulting in new solutions through team discussion (Augereau-Landais et al., 2023; Concina, 2023).

In music education, critical thinking helps students analyze and understand musical works, improving their musical performance skills and musical understanding (Kokkidou, 2022). Creativity stimulates students' creative expression through composition, improvisation, and other activities in music education (Chen, 2019). Communication skills are mainly reflected in team performance, where students need to communicate through non-verbal means such as gestures and eye contact (Janine, 2024). Collaboration develops students' teamwork and leadership skills through ensemble and group performances (Evenhouse, 2019).

To sum up, the application of 4C skills in music education not only promotes the development of students' musical skills but also lays a solid foundation for their future studies and careers. By emphasizing the cultivation of these skills, music education can enrich students' artistic experiences and promote their overall growth and success in the broader educational context.

Discussions and Conclusions

This study explores the importance of 21st-century skills, particularly the 4Cs (critical thinking, creativity, communication, and collaboration) in music education. By analyzing the effectiveness of the current music education system and its reform programs through an extensive search of relevant research, the study points out that the 4C skills are key factors for students' future workplace success. The study highlights the importance of integrating the 4C skills in music education, showing that such integration can significantly improve students' musical literacy and basic competencies, emphasizing the critical role of arts education in students' overall educational experience. Through systematic review and analysis, the research identifies the problem of homogenization in current music

education methods regarding the integration of 4C skills and proposes methods to integrate these skills effectively. Additionally, the research results demonstrate that 21st-century skills can significantly improve students' musical literacy and performance ability, promoting the progress of music education. The study also underscores the importance of 21st-century skills in the face of advances in technology, communication methods, and global challenges. The purpose of this study is to propose and analyze ways to integrate the 4C skills into music education practice, emphasize their importance for the development of students' musical literacy and overall ability, and provide useful insights for future music education reform and practice.

Limitations and Future Research

Although this study makes some valuable contributions to the descriptive research on the 4C skills of the 21st century, there are certain limitations. This study combines the 21st-century 4C skills with music education without focusing on a particular artistic form of expression, which limits its universality. The scope of our findings should be largely validated across different artistic forms of expression. Therefore, future research could examine different artistic forms of expression in music education.

Statement of Conflict of Interest

The authors declare no potential conflict of interest with the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, writing, and/or publication of this article.

References

Abramo, J. M., & Reynolds, A. (2015). "Pedagogical creativity as a framework for music teacher education." *Journal of Music Teacher Education, 24*(3), 1-15. https://doi.org/10.1177/1057083714543744

Allsup, R. E. (2012). The moral ends of band. *Theory into Practice*, *51*(3), 179-187.

Akcanca, & Nur. (2020). 21st Century Skills: The Predictive Role of Attitudes Regarding STEM Education and Problem-Based Learning. *International Journal of Progressive Education, 16*(5). 443-458.

Augereau-Landais, M., Mourey, F., Feybesse, C., & Sundquist, D. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence*, 11(3), 54.

Balls, J. D., Eury, A. D., & King, J. C. (2011). *Rethink, rebuild, rebound: A framework for shared responsibility and accountability in education*. MA: Pearson Learning Solutions.

Barron, F. (1963). Creativity and Psychological Health. New York: Van Nostrand.

Bennett, D., & Freer, P. (2019). Fostering shared leadership and personal responsibility in music ensembles. *Music Education Research, 21*(3), 283-297.

Bennett, T. (2020). *Running the room: The teacher's guide to behaviour.* John Catt Educational.

Bergee, M. J., & Weingarten, K. M. (2020). Multilevel models of the relationship between music achievement and reading and math achievement. *Journal of Research in Music Education, 68*(4), 354-371.

Beswick, K., & Fraser, S. (2019). Developing mathematics teachers' 21st century competence for teaching in STEM contexts. *ZDM, 51*(6), 955–965. Available at: https://doi.org/10.1007/s11858-019-01084-2.

Biasutti, M., & Concina, E. (2018). "The effective integration of technology into music education: Teacher perceptions of best practice." *Technology, Pedagogy and Education, 27*(1), 77-92. https://doi.org/10.1080/1475939X.2017.1389712

Blazar, D. (2021). Teachers of color, culturally responsive teaching, and student outcomes: Experimental evidence from the random assignment of teachers to classes. *EdWorkingPaper: 21–501*. https://doi.org/10.26300/jym0-wz02

Blocher, L., Greenwood, R., & Shellahamer, B. (1997). Teaching behaviors of middle school and high school band directors in the rehearsal setting. *Journal of Research in Music Education, 45*(3), 457-469.

Brown, J. D., & Benedict, C. (2019). Critical thinking in music education: A review of current practices. *International Journal of Music Education, 37*(1), 60-73.

Burnard, P. (2012). Musical creativities in practice. OUP Oxford.

Chavin, M. (2002). Music as communication. *Alzheimer's Care Today, 3*(2), 145-156.

Chen, W. (2019). Creativity in Music Education. *Journal of Music Education*, 45(2), 113-126.

Collins, P. A., & Durant, J. R. (2021). Enhancing musical decision-making through critical listening. J*ournal of Music Theory Pedagogy, 35*(2), 149-168.

Concina, E. (2023). Effective Music Teachers and Effective Music Teaching Today: A Systematic Review. *Education Sciences*, *13*(2), 107.

Csikszentmihalyi, M. (1999). Implications of a Systems Perspective for the Study of Creativity. *Handbook of creativity, 313.*

Dana-Picard, T., & Hershkovitz, I. (2020). Enhancing the 4Cs among College Students through a Project-Based Learning Model. *Education and Information Technologies, 25*(1), 1-19.

Davis, S., & Kruse, N. (2020). Understanding critical thinking in music students through immersive musical experiences. *Research Studies in Music Education, 42*(3), 309-322.

Dewey, J. (1997). How we think. Mineoloa. *New York: Courier Dover, 13.*

Dillenbourg, P., Baker, M., & Blaye, A. i O'Malley, C. (1996). The evolution of research on collaborative learning. En E. Spada i P Reiman (Eds.) Learning in Humans Machine: Towards an interdisciplinary learning science, 189–211.

Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational Leadership*, *73*(2), 44-48.

Enrico C. Riconalla., & Adelfa C. Silor. (2017). Music Pedagogy for the 21st Century Globalized Curriculum. The Asian Conference on Asian Studies 2017 Official Conference Proceedings, The International Academic Forum www.iafor.org.

Erdoğan, T. (2019). Collaboration in Music Education. *International Journal of Music Education, 37*(4), 543-556.

Evans, P., & Morrison, S. J. (2020). Reflective practice in music ensemble rehearsals: Developing and testing new ideas. *Journal of Music Performance Research, 9*(2), 152-168.

Evenhouse, L. (2014b). 21st century learning skills: The 4Cs in general

music. *Illinois Music Educator*, *75*(1).
Facione, P. A. (2015). "Critical thinking: What it is and why it counts." *Insight Assessment.* https://www.insightassessment.com/Resources/Critical-Thinking-What-It-Is-and-Why-It-Counts
Finney, J. & Philpott, C. (2010). Informal learning and meta-pedagogy in initial teacher education in England. *British Journal of Music Education, 27* (1), 7-19.
Foster, L. S. (2022). Teaching critical thinking in music: The role of the conductor. *Music Educators Journal, 108*(2), 52-58.
Greenberg, D. M., Rentfrow, P. J., & Baron-Cohen, S. (2020). Music education and emotional intelligence: Exploring the connection. *Psychology of Music, 48*(4), 530-545.
Halpern, D. F. (1996). *Thought and Knowledge: An Introduction to Critical Thinking.* Psychology press.
Halpern, D. F. (1998). Teaching Critical Thinking for Transfer Across Domains: Disposition, Skills, Structure Training, and Metacognitive Monitoring. *American Psychologist*, *53*(4), 449.
Halpern, D. F. (1999). Teaching for critical thinking: helping college students develop the skills and dispositions of a critical thinker. *New Directions for Teaching and Learning, 1999* (80), 69-74.
Harrison, S. D., & Ritchie, L. (2017). Role distribution and communication in successful musical ensembles. *International Journal of Music Education, 35*(1), 26-38.
Henley, J., & Barton, G. (2020). Addressing challenges in music education: Funding, resources, and student involvement. *Music Education Policy, 15*(3), 207-220.
Hewitt, A. (2008). Children's creative collaboration during a computer-based music task. *JIJER International Journal of Educational Research*, *47*(1), 11-26.
Hickey, M., & Webster, P. (2001). Creative thinking in music. *Music Educators Journal*, *88*(1), 19-23.
Huber, C. R., & Kuncel, N. R. (2016). "Does college teach critical thinking? A meta-analysis." *Review of Educational Research, 86*(2), 431-468. https://doi.org/10.3102/0034654315605917
Huitt, W. (1998). *Critical thinking: An overview Educational Psychology Interactive.* Valdosta State University.

Janine. (2024). Using Music to Develop Critical Thinking. Retrieved from https://www.janinesmusicroom.com/using-music-to-develop-critical-thinking/

Johansen, G. (2013). Music education and the role of comparative studies in a globalized world. *Philosophy of Music Education 21*(1)*,* 41-51.

Johnson, L. (2019). *Analyzing Descriptive Research*. London: Sage Publications.

Jones, M. (2022). Creative Thinking in Music Education: A Descriptive Study. I*nternational Journal of Music Pedagogy, 37*(1), 89-101.

Karlsson, J., & Juslin, P. (2008). Musical expression: an observational study of instrumental teaching. *Psychology of Music, 36*(3), 309-334.

Kinney, D. W. (2004). The effect of performing ensemble participation on the ability to perform and perceive expression in music. *International Journal of Music Education, 22*(1), 45- 58.

Koenig, J. A. (Ed.). (2011). *Assessing 21st century skills: analysis of a workshop.* National Academies Press.

Kokkidou, M. (2022). Critical Thinking and School Music Education: Literature Review, Research Findings, and Perspectives. *Journal for Learning through the Arts*, *18*(1), 1-15.

Kolk, M. (2022). Communication Skills in the Classroom. *Journal of Educational Technology, 33*(3), 45-59.

Koutsoupidou, T., & Hargreaves, D. (2009). An experimental study of the effects of improvisation on the development of children's creative thinking in music.*Psychology of Music, 37*(3), 251-278.

Kratus, J. (1990). Structuring the music curriculum for creative learning. *Music Educators Journal, 76*(9), 33-37.

Lai, E. R. (2011). "Critical thinking: A literature review." *Pearson's Research Reports.* https://images.pearsonassessments.com/images/tmrs/CriticalThinkingReviewFINAL.pdf

Lee, H. (2021). *Critical Thinking Development in Music Education*. Journal of Music Education Research, 45(2), 123-135.

Lemov, D. (2021). *Teach like a champion 3.0: 63 techniques that put students on the path to college.* Jossey-Bass.

Lisk, E. S. (2010). *The musical mind of the creative director.* Meredith Music Publications.

Maloney, J. E. (1992). *Teacher training in creativity: a phenomenological inquiry with teachers who have participated in creativity coursework.* University of Massachusetts.

Maneen, C. A., (2016). *A Case Study of Arts Integration Practices in Developing the 21st Century Skills of Critical Thinking, Creativity, Communication, and Collaboration.* Gardner-Webb University.

Marcus, M. (2021). Teacher-student relationships matter. *Harvard Graduate School of Education.* https://www.gse.harvard.edu.

Mark, M. L. (1996). Contemporary music education. *(No Title).*

Martinez, P. E., & Smith, H. M. (2020). Exploring cultural diversity in music education: Impacts on critical thinking. *Music Education Research, 22*(4), 369-382.

Mayer, R.E. (1990). Problem solving. In M.S. Eysenck (Ed.), The Blackwell Dictionary of Cognitive Psychology (pp. 284-288). Oxford: Basil Blackwell.

McPeck, J. E. (1990). *Teaching critical thinking: Dialogue and dialectic*. Routledge.

Mertes, L. (1991). Thinking and writing. *Middle School Journal, 22* (5), 24-25.

Molnar, E. L. (2005). *The effects of the rehearsal techniques of Edward S. Lisk on the musicality of junior high bands' performance.* (Doctoral dissertation, Indiana University of Pennsylvania).

Moshtagh, R., Evenhouse, M., & Dana-Picard, T. (2021). Collaboration in Educational Practices. *Educational Research Review*, 34, 100-115.

National Research Council. (2008). *Research on Future Skills Demands: A Workshop analysis. M. Hilton, Rapporteur. Center for Education, Division of Behavioral and Social Sciences and Education.* Washington, DC: The National Academies Press.

National Research Council. (2010). *Exploring the Intersection of Science Education and 21st Century Skills: A Workshop analysis. M. Hilton, Rapporteur. Board on Science Education, Center for Education, Division of Behavioral and Social Sciences and Education.* Washington, DC: The National Academies Press. New Directions for Teaching and Learning, June 2012.

Nguyen, T. T. (2021). Pop music pedagogy and its impact on cultural identity representation. *Popular Music and Society, 44*(1), 73-89.

Oare, S. (2012). *21st Century Learning Skills*. Journal of Educational Research. Partnership for 21st Century Skills. (2015). P21 framework definitions.Retrieved from http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_ Logo_2015.March 14, 2015.

Robinson, K. (2017). "Out of our minds: The power of being creative." John Wiley & Sons.

Pogonowski, L. (1987). Developing skills in critical thinking and problem solving. *Music Educators Journal*, *73*(6), 37–41.

Pollard, V. (2012). Creativity in Education. *Journal of Creative Behavior*, 46(1), 30-47.

Priest, T. (2002). Creative thinking in instrumental classes. *Music Educators Journal, 88*(4), 47- 58.

Richardson, C. P., & Whitaker, N. L. (1992). Critical thinking and music education. In *Handbook of research on music teaching and learning: A project of the Music Educators National Conference* (pp. 546-560).

Sawyer, R. K. (2003). Group Creativity: Music, Theater, Collaboration. Psychology Press. 41(03)

Schleicher, A. (2011). *The Four C's of 21st Century Learning*. Educational Leadership.

Schleicher, A. (2018). "World class: How to build a 21st-century school system." OECD Publishing.

Smith, J. (2005). The Teachability of Creativity. *Creativity Research Journal*, 17(4), 37-45.

Smith, J. (2020). *Descriptive Research Methods*. New York: Academic Press

Smith, K., & Jones, A. (2018). Interactions in chamber music rehearsals: High school students' perspectives. *Journal of Research in Music Education, 66*(4), 459-474

Strom, R. D., & Strom, P. S. (2002). Changing the rules: Education for creative thinking. *Journal of Creative Behavior*, *36*(3), 183-200.

Topoğlu, O. (2014). Critical Thinking and Music Education. *Procedia - Social and Behavioral Sciences, 116,* 2252-2256.

Trilling, B., & Fadel, C. (2009). *21st Century Skills: Learning for Life in Our Times*. Jossey-Bass.

University of Kansas. (2020). Music education and academic achievement: A comprehensive study. KU Education Review, 12(1), 67-82.

VanAlstine, S. K. (2011). *Pre-service elementary education teachers: An international approach to music methods coursework.* University of Minnesota.

Voogt, J., Erstad, O., Dede, C., & Mishra, P. (2013). Challenges to learning and schooling in the Digital Networked World of the 21st Century. *Journal of Computer Assisted Learning, 29*(5), 403–413.

Wai Chen, J. (2017). Group creativity: mapping the creative process of a cappella choirs in Hong Kong and the United Kingdom using the musical creativities framework. *Music Education Research*, *20*(1), 59-70.

Wagner, T. (2008). *The global achievement gap: Why even our best schools don't teach the new survival skills our children need-and what we can do about it.* ReadHowYouWant. com.

Wagner, R. K. (1997). Intelligence, Training, and Employment. *American Psychologist, 52* (10), 1059.

Wang, X. (2023). Exploring positive teacher-student relationships: The synergy of teacher mindfulness and emotional intelligence. *Frontiers in Psychology, 14.* https://doi.org/10.3389/fpsyg.2023.1301786

Wang, Y. (2023). *Collaboration Skills in 21st Century Music Education*. Educational Studies in Music, 29(3), 210-223.

Webster, P. R. (2002). *Creative thinking and music education: encouraging students to make aesthetic decisions. Paper presented at the Proceedings of the 10th Anniversary European Society for the Cognitive Sciences of Music, Musical Creativity Conference.* University of Liege.

Williams, D. A. (2020). Music ensembles and the development of social skills: A longitudinal study. Social Psychology of Education, 23(1), 85-100.

Woody, R. (2002). Emotion, imagery and metaphor in the acquisition of musical performance skill. *Music Education Research, 4*(2), 213-224.

Young, R. E. (ed.). (1980). Fostering Critical Thinking. New Directions for Teaching and Learning, no. 3. San Francisco: Jossey-Bass.