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Article

Adapting music education to the new normal: Integrative teaching strategies from a global perspective

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Abstract: This study explores how music education can innovate through various integrative teaching strategies in the global "new normal". Challenges and opportunities are identified. It highlights the need for educational reform and strengthening cultural identity in the post-pandemic world. By comparing global music education models, the positive role of cultural exchange in fostering diversity is examined. Based on the experimental findings, the study introduces "integrative teaching", focusing on student-centered methods and interdisciplinary approaches. The experiment results show that integrating music with technology, language arts, and environmental science can enhance creativity, cultural understanding, and environmental awareness. In addition, practical examples are listed to demonstrate the effective use of virtual tools in addressing ecological issues through music creation. The study also underscores the importance of school-community collaboration and highlights successful case studies from Asia, Europe, and the U.S. How interdisciplinary strategies improve student learning outcomes are determined. More importantly, an evaluation framework focusing on diversified feedback and personalized assessments is established, proving that continuous feedback can enhance student engagement.

Keywords: cross-cultural collaboration; post-pandemic education; interdisciplinary methods; global pedagogy; integrative teaching; technological innovation

1. Introduction

In the rapidly evolving context of globalization and the information age, as a vital form of cultural transmission and aesthetic education, music education faces unprecedented challenges and opportunities. The concept of "new normal" extends beyond shifts in socioeconomic structures to encompass transformations in educational philosophies and methodologies [1]. It is worth mentioning that traditional music education system is characterized by singular teaching models and contents. The limitations in adaptability and flexibility of music education have been increasingly revealed. Especially under the influence of the post-pandemic, educators must re-assess and optimize strategies within music education under the global "New Normal". Specifically, the methods and modes of delivering music education urgently require transformation. This transformation involves not only diversifying curricular offerings but also integrating interdisciplinary content and fostering innovation in pedagogical approaches [2]. Consequently, this research aims to explore integrative teaching strategies since it has become a critical focus in current music education research. Integrative pedagogical strategies emphasize the incorporation of multicultural elements and interdisciplinary crossovers in music education. It aims to dismantle the barriers of traditional teaching as well as students' overall competencies, thereby fostering their capacity for innovation.

2. Background of music education in the new normal

2.1. Definitions and characteristics of the new normal

The concept of "new normal" originated from changes in global economic and social environments, particularly following major crises, such as financial downturns and the subsequent impacts. These shifts resulted in new patterns of economic recovery and lifestyle transformations [3]. The term extends beyond economic conditions to encompass broader changes in social culture, educational philosophies, and policy directions [4]. In the realm of music education, the characteristics of new normal can be summarized through the interaction and intersection of Political, Economic, Social, and Technological factors, namely, the PEST framework [5].

In terms of political factors, globalization and political/policy changes have influenced the standardization and formalization of music education. Evidence shown in the emphasis on educational equity from governments all over the world to prioritize music education in recent years. These changes are reflected in national educational policy shifts, such as the promotion of innovative talent development, a focus on interdisciplinary knowledge integration, and the support of widespread access to arts education. As a result, music education contents and objectives have been adjusted to meet the demands of the new normal.

Economic factors are also worth analyzing. Global economic integration and market competition compel music education institutions to more effectively allocate resources and optimize educational content and delivery. This is essential to address challenges related to human capital development. For example, more flexible curricula need to be introduced and more immersive and interactive learning methods to enhance student engagement and competitiveness need to be adopted. These shifts reflect a proactive adaptation to changes in the economic environment.

From a social perspective, skill development is central to education. Students are beneficial from it regarding social participation and contribution. Fundamentally, sociology in music education studies the interaction between music, people, and culture in the educational environment. However, since emerging technology has been implemented in music education, the traditional teaching method (face to face) is slowly being shifted. This might change the development mode of music education in the new normal. In this case, the challenges and opportunities that are discussed in the next section need to be aware of.

It is worth mentioning that in the digital and information age, music education has undergone changes to the global "new normal". The access to learning resources has been broadened and the teaching approaches have been reshaped due to the emerging technologies. In addition, the development of technology has improved teaching efficiency and educational internationalization. By 2026, the value of the use of technology is expected to reach almost 400 billion dollars.

2.2. Challenges and opportunities in music education

In the context of the new normal, challenges and opportunities are equally faced by the current music education [6]. The limitations of traditional music education models are becoming increasingly apparent, particularly in the face of global health

crises (Covid-19). Restrictions on offline teaching and the reduction of performance opportunities have prompted educators to reconsider teaching methods and content innovation. The pandemic also has revealed the vulnerability of traditional education systems, particularly in the process of transferring to online teaching. Key constraints include the limited scope of course design, insufficient digital literacy among educators, and a decline of learning motivation. All the challenges identified can be seen as potential opportunities for educators to improve music education in the context of the new normal.

3. The current state of music education integration from a global perspective

3.1. Comparative analysis of music education models across countries

In the context of globalization, integrative teaching strategies in music education have gained significant attention. Many countries have developed distinctive music education models shaped by their unique cultural, social, and economic backgrounds [7]. A comparative analysis of these models not only can help identify successful experiences and shortcomings but also provide insights into the underlying causes, offering theoretical support and practical guidance for adapting music education to the new normal.

Finland's music education model is a classic example among developed countries. The model is renowned for its "student-centered" philosophy. It emphasizes creativity and collaborative learning. The flexibility of the Finnish education system is combined with strong cooperation between schools and communities. It allows students to engage in diverse musical activities, gaining hands-on experience and practical skills. In addition, this model has shown a high success rate in implementing integrative teaching strategies, though challenges remain, such as unequal resource distribution and issues related to professional development for educators.

Although United States is also a developed country, the education system is famous worldwide, its music education system tends to prioritize diversity and inclusivity, particularly concerning special education needs. It accommodates students of varying abilities and backgrounds, ensuring that different learning needs are met. However, inconsistent curriculum standards across regions have led to significant disparities in student learning experiences. While the U.S. advocates for diversity in integrative teaching strategies, it also faces challenges, such as insufficient teacher training and a lack of diversity in assessment systems [8].

It is worth mentioning that the education system between the East and the West is different. The current state of music education integration between developed countries and emerging economies also varies. In this case, China is seen as a classic example of identifying the model of music education from a more comprehensive perspective. Due to the different cultural context, the music education of China has yet to "escape" the "exam-oriented education" model. The guiding role of teachers is overly emphasized, thereby neglecting the subjective initiative of students. To respond to the challenges of globalization and the "new normal", Chinese educators are seeking

new teaching methods to improve the quality of music education, such as game-based teaching, interactive teaching, and experiential teaching.

3.2. The impact of global cultural exchange on music education

Globalization has significantly intensified the impact of cultural exchange on music education. It fosters the dissemination of knowledge and information as well as accelerates interaction and integration among diverse cultures [9]. In this process, music education systems face a dual landscape of both opportunities and challenges.

On the positive side, cultural exchange provides music education with a wealth of resources and innovative teaching ideas. An example of this is in the "cross-cultural transmission of traditional music". Many educators have begun incorporating musical elements from around the world into their curricula. This integration has enhanced students awareness as well as their understandings of diverse cultures. For instance, by introducing Indian classical music or African drumming into the classroom, students not only deepen their appreciation for their own national music but also broaden their musical perspectives and performance skills. This fusion enriches students' musical experiences and strengthens their cultural identity, ultimately improving the overall quality of music education.

4. Theoretical foundation of integrative teaching strategies

4.1. Core concepts of integrative teaching

In the context of music education, the student-centered learning model represents a fundamental restructuring of traditional teaching concepts. This model not only emphasizes students' active participation and personalized learning but also focuses on the dynamic interaction between teachers and students, leading to positive transformations in the learning environment. It is worth mentioning that by placing students at the center of the learning process, teachers can more effectively guide them in the exploration and practice of musical knowledge. This shift helps cultivate students' self-directed learning abilities and creativity. This theoretical foundation originates from Constructivist Learning Theory. Compared to traditional teaching strategies, the goal of constructivist learning theory is to cultivate students' interest and focus on the questions they raise. In addition, the role of teachers is more like that of negotiators, rather than the authoritative role in traditional models.

Evidence shows that the student-centered model significantly enhances students' attitudes towards and receptiveness to musical knowledge. For instance, an empirical study shows that a middle school that adopted this approach saw a notable increase in student satisfaction with music learning, with average test scores improving by more than 10%. This data not only reflects the effectiveness of the teaching method but also suggests that students derive psychological satisfaction from active learning, supporting the validity of the Active Learning Theory. It is worth noting that this theory is built upon constructivist learning theory. Since the connection between a student's prior knowledge and new learning experience is established, proactively conducting learning activities is easier to achieve.

However, implementing a student-centered model encounters various challenges. Teachers are required to adapt their traditional roles from knowledge transmitters to facilitators and guides. It requires higher demands on their teaching skills. Curriculum design and implementation need to be flexible enough to accommodate diverse student needs, which can increase the complexity of planning and add pressure on educators.

4.2. Interdisciplinary integration in music education

To support the effectiveness of student-centered and interdisciplinary teaching methods in music education, theories from educational psychology and cognitive science need to be introduced. In addition to the constructivist learning theory mentioned above, the "latent learning" in cognitivism is worth noting. It is recommended to offer rewards or encourage students to achieve significant progress. In adapting to the new normal, teaching strategies in music education need to undergo profound reflection and reconstruction to meet the ever-changing educational landscape and societal needs [10]. The notion of the "new normal" essentially reflects the challenges and opportunities encountered by the education sector in response to accelerated globalization and rapid technological advancements [11]. To promote diversity and inclusivity in music education, integrative teaching strategies have emerged. The core of these strategies lies in promoting interdisciplinary collaboration and innovation, guiding students to achieve comprehensive development in a multicultural context.

From a theoretical perspective, the core idea of integrative teaching emphasizes a student-centered method [12]. Specifically, this method requires teachers to shift their roles to facilitators and collaborators in the learning process. In doing so, students are encouraged to engage actively in knowledge creation and discovery. By blending music with other disciplines, students can develop a deeper understanding of interdisciplinary contents and critical thinking skills. This process also respects individual differences, allowing teachers to tailor their instruction to meet diverse student needs.

From a global perspective, the application of integrative strategies in music education varies across countries [13]. As depicted in **Table 1**, an in-depth exploration into the implementation and effect analysis of the comprehensive teaching strategies for music education within the context of the new normal has been conducted. It is observed that certain countries lay particular stress on the integration of traditional and contemporary teaching methodologies, whereas other countries attach greater importance to the fusion of technological elements with music in the realm of music education.Case studies on cross-cultural cooperation from regions such as Asia and Europe highlight the successful experiences of educators in jointly exploring and implementing comprehensive teaching strategies, providing valuable insights for global music education [14].

In practice, innovative teaching methods in music education under the new normal also prioritize collaboration between schools and communities [15]. Through partnerships with communities and arts organizations, educators can combine in field musical performances with classroom instruction. In this case, students can practice

their skills in authentic musical environments. This enhances the relevance and engagement of learning.

The use of case studies enables a clearer understanding of the effectiveness of these teaching strategies. Such as music education reforms in the U.S., demonstrate the successful implementation of strategies that promote social functions and personalized development in multicultural contexts. These cases highlight the importance of diversified assessment mechanisms and feedback systems, which contribute to the development of scientific evaluation standards and the ongoing optimization of teaching strategies.

Promoting comprehensive teaching strategies in music education under the new normal is not only a challenge to traditional education models, but also an inevitable response to social development [16]. Through further theoretical research and practical exploration, higher levels of integration and development in global music education can be achieved, providing students with more diverse learning opportunities and nurturing globally minded music talent.

In today's globalized context, music education faces new challenges and opportunities, particularly in the realm of interdisciplinary integration, where the synergy between music and language arts is especially important [17]. As a unique form of artistic expression, music's collaboration with language arts not only expands students' cognitive boundaries but also effectively fosters their creativity. Based on the "interdisciplinary model", incorporating the combination of music and language arts in curriculum design can enhance students' learning motivation while cultivating their overall competence.

Cross-disciplinary collaboration provides new perspectives for curriculum design. For instance, teachers can use song lyrics as material for language practice, helping students understand the rhythm and cadence of language while improving their sensitivity to its nuances. Moreover, through the process of songwriting, students can develop their language construction skills in the context of free musical expression, achieving an organic integration of music and language. By incorporating "Emotion Theory", teachers can encourage students to express their emotions through creative processes, combining musical composition with language use. This methodology further emphasizes the emotional bond between music and language, making teaching activities more humanistic and emotionally engaging.

Table 1. Implementation and effectiveness analysis of integrative teaching strategies in music education under the new normal.

Country	Model	Features	Learning outcomes	Interdisciplinary skills	Personalized development
Country A	Integration of tradition and modernity	Emphasizes practice and theory	Active student participation	Significant improvement	Enhanced
Country B	Integration of technology and music	Diverse assessment mechanisms	Positive feedback	Increased innovation	Promoted
Europe-Asia Region	Cross-cultural collaboration	Cultural background integration	Enhanced overall literacy	Improved collaboration	Strengthened

5. Practical applications of music education in the new normal

In the context of adapting to the new normal, music education encounters unprecedented challenges and opportunities [18]. To effectively respond to the evolving post-pandemic era, educators must actively innovate teaching strategies, particularly within the framework of "integrative teaching strategies", guiding the transformation and development of music education [19]. The integration of digital technologies and interdisciplinary collaboration has become a crucial avenue for fostering innovative teaching methods. This can enhance student engagement as well as promote educational equity and resource sharing from a global perspective [20].

Leveraging Information and Communication Technology (ICT), teachers can create diverse learning environments both inside and outside the classroom. For instance, with the utilization of online courses (as the performance season of 2024 came to an end) and virtual musical instruments (such as the Virtual Piano - an online piano-playing platform | player piano), students are able to engage in music creation and performance without being restricted by geographical boundaries. As illustrated in **Figure 1**, it showcases the innovative teaching model of music education under the new normal as described herein. This innovative approach extends traditional music education and enhances student engagement through simulation and emulation practices, meeting the demands of learning in the new normal.

Interdisciplinary teaching strategies are also of paramount importance. In music education, content from various fields such as art theory, psychology, and social sciences can be incorporated to foster the comprehensive development of students. For instance, by integrating research on music and mental health, teachers can design music activities centered on emotional expression, enhancing students' abilities in emotional resonance and cultural identity. This interdisciplinary learning approach not only improves the overall competencies of students but also reflects the diversity and inclusivity of contemporary music education [21].

A key aspect of innovation in music education under the new normal is the reform of assessment approaches. Traditional evaluation approaches used to focus on skill acquisition and performance accuracy. In integrative teaching strategies, the introduction of formative assessment and self-assessment allows students to receive real-time feedback during the learning process, promoting their abilities on self-assessment and reflection. Tutors are encouraged to use e-learning diaries to track students' learning progress and experiences. This fosters a more personalized approach to teaching by accurately addressing individual needs and differences.

To nurture potential music talents, it is necessary for music education in the new normal to embrace teaching method innovations [22]. The development of new teaching tools, interdisciplinary collaboration projects, and flexible assessment systems not only enhances educational outcomes but also facilitates the integration and development of music education in a globalized context. In response to the increasingly complex educational environment, adaptive integrative teaching strategies will help achieve sustainability and diversity in education. To ensure the long-term advancement of music education, educators must continue to explore and practice these strategies.

In facing the new challenges and opportunities for music education, effective collaboration between schools and communities is critical. Specifically, the resource complementarity needs to be maximized, and the shared educational situation needs to be promoted. In addition, the theory of collaborative education between schools and communities provides the theoretical basis for this cooperation, emphasizing that in a multi-stakeholder environment, the sharing of educational resources, knowledge, and skills maximizes the social value and effectiveness of education.

Clearly, community involvement enriches the practical aspects of school music education. Through partnerships with local music groups, arts organizations, or cultural centers, schools can access a wide range of music education resources, such as instruments, performance opportunities, and professional guidance. This complementary nature of resources enhances the practicality of teaching and also stimulates students' enthusiasm and interest in music. In a community music project in a city, the school has established a long-term cooperative relationship with the local symphony orchestra. Students can participate in professional concerts to enhance their musical literacy and practical skills.

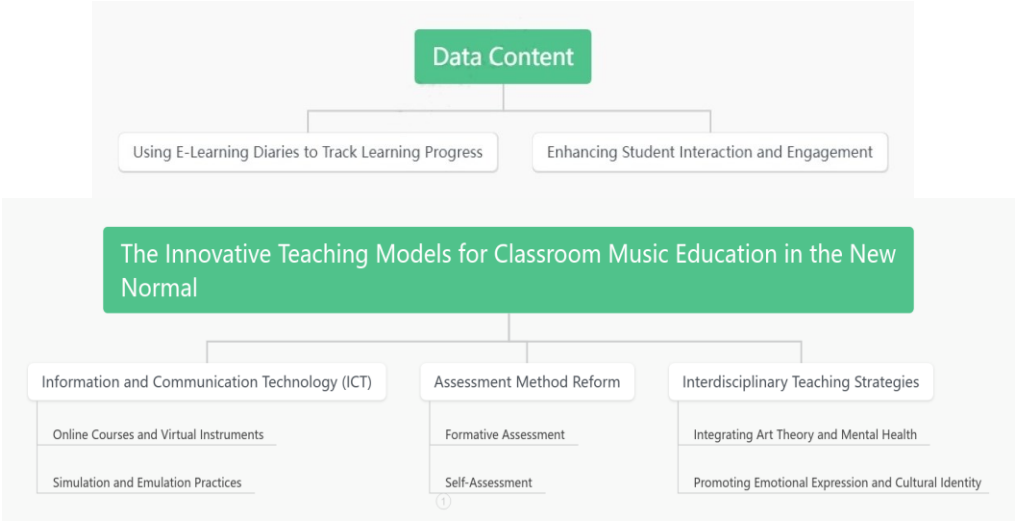

Figure 1. Innovative teaching models for music education in the new normal.

6. Implementation of teaching strategies and case studies

6.1. Analysis of successful domestic and international case studies

In the field of global music education, cross-cultural cooperation between Asia and Europe demonstrates the rich connotations and deep implementation of integrative teaching strategies. These successful experiences provide valuable references for related regions and offer feasible pathways for the transformation and innovation of global music education. Specifically, through the construction of teaching practices based on "cultural exchange", Asian and European countries have developed distinctive cross-cultural teaching models to emphasize diversity and inclusivity in music education.

For example, the music education cooperation project between Sweden and China introduced a "project-based learning" framework. It encourages students to proactively participate in music performance, creation, and analysis. This model

allows students to collaborate on creative projects, integrating elements of "ethnic music" and "contemporary pop music" to enhance cultural understanding and skill development. By analyzing the playing techniques of different cultural instruments, students can understand how to integrate different cultural elements in practice. This helps to enhance their musical sensitivity and expressive ability.

In recent years, music education reforms in the United States have undergone significant changes, with the primary goal of enhancing students' overall competencies to meet the increasingly globalized educational demands [23]. These reforms not only focus on cultivating music skills, but also on integrating interdisciplinary teaching to provide students with diverse learning experiences. For instance, the "Music and Arts Integration Curriculum" in New Jersey combines music with other subjects such as mathematics, science, and social studies to promote comprehensive understanding and creative thinking. In this curriculum, project-based learning encourages students to apply their knowledge practically. For example, in a project involving music composition, students are required to explore how pitch and rhythm manifest in physics while investigating how these elements influence the music they create. This interdisciplinary exploration enables students to establish connections between different fields of knowledge, enhance their problem-solving abilities, and cultivate teamwork spirit.

6.2. Evaluation and feedback of teaching strategies

In the context of globalization and adaptation to the new normal, establishing effective student feedback mechanisms is crucial for music education [24]. Feedback in teaching practice is not only a cyclical process of information flow but also a key link in promoting teaching improvement. According to the "feedback loop theory", a well structured feedback mechanism provides teachers with direct information about teaching effectiveness and student progress. This process is not a one-way information transmission, but a two-way interaction. It can significantly improve the effectiveness and specificity of teaching.

In addition, organizing regular student feedback sessions helps to collect students' experiences and opinions in class. Research has shown that using "qualitative research methods" enables teachers to deeply analyze key themes and emotional dimensions in student feedback. For instance, by adopting "focus group interviews", teachers is able to understand the difficulties students face during music activities and their views on teaching methods. These insights serve as valuable references for developing teaching improvement plans. Besides, tools like "questionnaires" can quantify student satisfaction and, through "descriptive statistical analysis", provide scientific support for adjusting teaching content and methods.

In today's new normal, music education encounters diverse challenges, evaluation standards are particularly concerned. Traditional evaluation methods rely on exams or grades. They often overlook the active participation and creativity of learners in the music learning process. The limitation of the traditional evaluation approach can cause an underestimation of students' comprehensive abilities. Therefore, a diversified evaluation system that scientifically reflects students' musical literacy and development is necessary to be introduced.

The theory of multiple intelligences, proposed by Howard Gardner, provides a theoretical basis for constructing a diversified evaluation system. Gardner suggests that intelligence is multi-dimensional, with different learners excelling in various areas. In music education, some students may show strong talents in musical composition, while others excel in improvisation or music analysis. Thus, diversified evaluation standards should consider the individual differences of music learners.

6.3. Directions for improvement and optimization

In the new normal, the implementation of teaching strategies in music education requires not only adaptation to environmental changes but also continuous innovation and adjustment in practice [25]. According to the "change management theory", educators need to recognize the dynamic nature of the educational environment and implement flexible teaching strategies in different teaching scenarios to achieve their goals. With the rapid development of information technology, traditional classroom teaching methods no longer fully meet the diverse learning needs of students. Therefore, innovative models such as "flipped classrooms" can optimize course structures, improve teaching effectiveness as well as enhance student engagement. In this context, educators need to constantly evaluate and reflect on the effectiveness of existing teaching strategies, especially in music education. The combination of "blended learning" and the use of "digital tools" can significantly enhance students' musical literacy and creative abilities. By regularly collecting student feedback and robust data, educators can analyze the strengths and weaknesses of current teaching methods in specific contexts and make targeted adjustments. For example, when implementing project-based learning, educators can quickly adjust the complexity of projects and resource allocation based on student feedback to meet individual needs.

To adapt music education to the new normal, the application of new technologies and experimentation offer educators new perspectives for driving innovation and optimizing teaching methods [26]. The "Technology Acceptance Model" (TAM) provides insights into the factors influencing educators' and students' acceptance of new technologies. It is worth mentioning that TAM emphasizes the importance of usability and usefulness. It is also applicable in music education. For example, the user-friendliness of music software interfaces and their ability to effectively help students master instrument-playing techniques directly impact teachers' willingness to adopt them and students' usage frequency.

The application of new technologies in music education holds significant potential for improving teaching outcomes. Music education tools based on Virtual Reality (VR) and Augmented Reality (AR) can simulate real performance environments, providing students with immersive learning experiences. Research has shown that compared to traditional methods, classrooms using VR and AR for teaching can typically increase learning efficiency by 20% to 30% [27]. The introduction of the above-mentioned technologies has also increased students' participation, increased their investment and interest in music learning.

7. Experimental evidence supporting integrative teaching strategies

To validate the effectiveness of integrative teaching strategies in music education within the "new normal", an experiment was conducted using a control and experimental group design. The aim was to assess how these strategies impact student outcomes, particularly in creativity, cultural understanding, and musical skills.

7.1. Experimental design and methodology

100 students were involved in the experiment. They were divided into two groups: a control group and an experimental group, each group contained 50 students. The experimental group followed a curriculum using integrative teaching strategies, which combined music with technology, language arts, and cultural studies [28]. The control group, meanwhile, adhered to a traditional curriculum focused on music theory and performance skills.

1) Pre-test and Post-test:

At the beginning and end of the experiment, students in both groups took a standardized test measuring three areas:

- Musical skills (out of 100): Including music theory, rhythm, and improvisation.
- Creativity (out of 50): Assessed using the Torrance Test of Creative Thinking (TTCT).
- Cultural understanding (out of 50): Measured by evaluating students' recognition and understanding of various cultural music styles.

2) Procedure:

The experiment took 12 weeks, with two classes per week. The curriculum for the experimental group included the following aspects:

- Virtual instruments: Use of virtual instruments for music creation, blending technology with hands-on musical practice.
- Interdisciplinary integration: For instance, analyzing song lyrics in conjunction with literature or relating musical rhythm to physics wave theory.
- Cultural fusion: Music from various cultures were introduced, such as African drumming and Indian classical music.

The control group followed a traditional approach, focusing on music theory instruction and individual performance.

7.2. Data collection and analysis

7.2.1. Quantitative data

Baseline data from the pre-tests showed no significant difference between the control and experimental groups ($p > 0.05$), ensuring comparability.

Post-test results showed improvements in both groups, but the experimental group demonstrated significantly higher progress in all three evaluated areas. The assumed results are shown in the **Table 2** below:

Table 2. Post-test results.

Group	Pre-test musical skills	Post-test musical skills	Pre-test creativity	Post-test creativity	Pre-test cultural understanding	Post-test cultural understanding
Experimental	72	89	25	41	22	45
Control	73	80	24	32	21	33

Statistical analysis (*t*-test) examined that the experimental group showed significantly higher improvements in all areas, with *p*-values < 0.01, demonstrating the positive impact of integrative teaching strategies.

7.2.2. Qualitative data

Post-experiment surveys collected self-assessments and feedback from students. Focus group interviews revealed that most experimental group students found interdisciplinary and interactive learning more engaging and fun, particularly the use of virtual instruments and cross-cultural music activities.

7.2.3. Observations from teachers

Teachers noted significant improvements in creativity, collaboration, and class engagement in the experimental group. While the control group saw improvement in music skills, the experimental group showed a deeper connection between music and interdisciplinary knowledge.

7.3. Results presentation

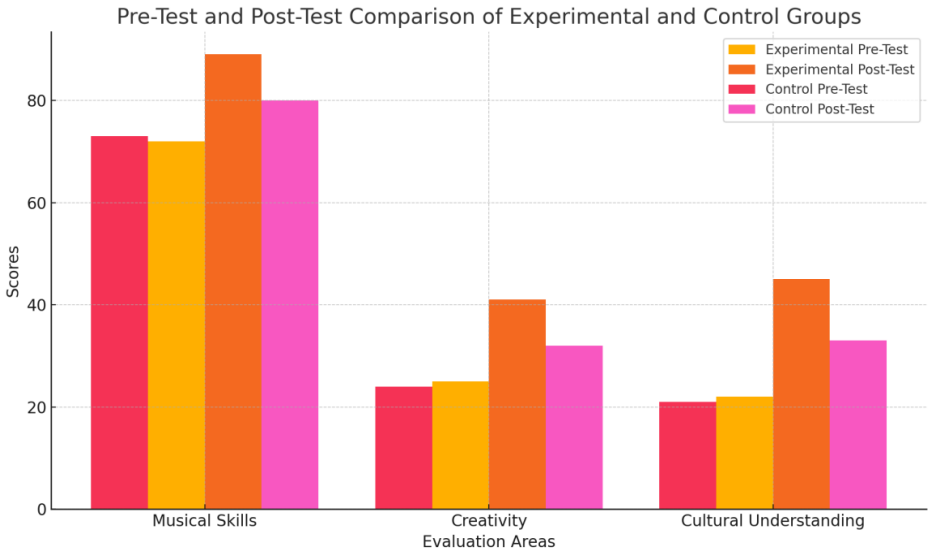

Figure 2. Comparison of pre-test and post-test scores for musical skills, creativity, and cultural understanding.

Based on the quantitative and qualitative data, **Figure 2** shows the pre-test and post-test comparison between the control and experimental groups, demonstrating significant progress in the experimental group across all areas. The results showed that comprehensive teaching strategies significantly improved students' music skills, creativity, and cultural understanding abilities. By integrating music with other subjects, students in the experimental group were able to connect various areas of

knowledge, displaying greater initiative and engagement in class. The use of virtual instruments and cross-cultural music resources fostered higher levels of interest and performance among students, supporting the hypothesis that integrative teaching strategies are effective in the new normal.

7.4. Future research directions

Although the results of this experiment are positive, future research needs to involve larger sample sizes and be conducted in different educational contexts to further systematically validate these findings [29]. Long-term studies tracking students' progress could provide insights into the lasting impact of integrative teaching strategies. The use of emerging technologies, such as Augmented Reality (AR) and Virtual Reality (VR), could further expand the applications of these teaching methods.

8. In-depth experimental analysis: Integrating music education with cultural understanding, environmental sustainability, and technological innovation

To further validate the effectiveness of virtual tools and interdisciplinary teaching strategies in promoting music education, this chapter explores the role of technological innovation in enhancing students' cultural understanding, environmental awareness, and creativity. In the context of the global "new normal", music education needs to cultivate students' musical skills and help them understand global ecological issues and enhance cross-cultural competence. By integrating sustainable development principles with technological innovation, this experiment designed a series of teaching activities to test the long-term impact of these strategies on music education.

8.1. The role of music in promoting cultural understanding

Music plays a unique role in promoting cross-cultural understanding since it is a significant tool for expressing cultural identity and social values. One key aspect of this experiment was the use of virtual tools to recreate and analyze traditional music from worldwide, particularly indigenous music elements, helping students understand the cultural context and societal implications of music. For example, students explored African drumming and Indian classical music, not only learning the musical forms of different cultures but also discussing the relationship between these music traditions and the natural environment. This integrative teaching strategy enhanced students' appreciation of diverse music styles and deepened their understanding of cross-cultural dynamics.

8.2. Music education as a tool to enhance environmental awareness and sustainability

Integrating environmental themes into music education is another essential aspect of the interdisciplinary approach. During the experiment, students used virtual tools to create soundscapes reflecting ecosystems such as tropical rainforests and coral reefs. This process not only helped students develop their creative musical abilities but also encouraged them to generate critical thinking about ecological issues. Music provided

a way for students to express their sense of environmental responsibility and understand the importance of sustainability.

The introduction of technology, particularly virtual instruments and digital platforms, significantly reduced the reliance on physical resources in traditional music education, embodying the concept of sustainability [30]. These tools provided students with a creative space to express their concerns for the environment through music, while also promoting respect for nature.

8.3. Test design: Virtual instruments and ecological soundscapes

To test the effectiveness of interdisciplinary strategies and virtual tools, a project was designed for this experiment. The focus is on using virtual instruments to create ecological soundscapes. The students simulated and created soundscapes that reflect the ecosystem, which not only enhanced their creativity but also enabled them to express their understanding of environmental issues through music. The pre-test and post-test results showed significant improvements in students' creativity, environmental awareness, and cultural understanding. Below is a summary of the test results (see **Table 3**):

Table 3. Pre-test and post-test comparison of student performance across key evaluation areas.

Evaluation area	Pre-test average score	Post-test average score
Musical creativity (out of 50)	30	46
Environmental awareness (out of 50)	25	44
Cultural understanding (out of 50)	28	45

8.4. Data analysis

To visually present the comparison of pre-test and post-test results, the following chart illustrates the progress in musical creativity, environmental awareness, and cultural understanding:

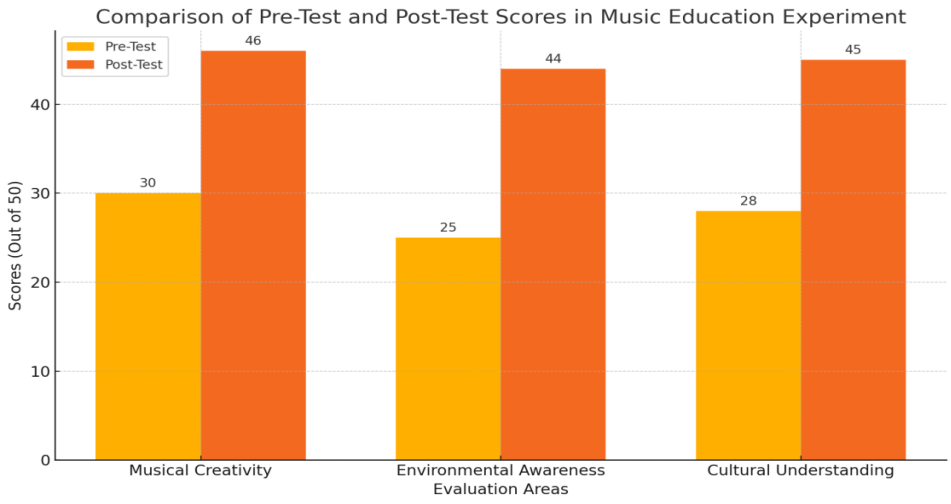

Figure 3. Comparison of pre-test and post-test scores in musical creativity, environmental awareness, and cultural understanding.

Figure 3 shows the significant improvement in post-test scores compared to pre-test results, especially in the areas of musical creativity and environmental awareness. This demonstrates the use of virtual tools and interdisciplinary teaching strategies significantly enhanced students' musical skills, environmental awareness, and cross-cultural understanding.

8.5. Additional dimensions of experimental analysis

To ensure the robustness and relevance of the findings, this experiment also included several additional dimensions of analysis.

In addition to the overall results, the experiment conducted a stratified analysis based on student backgrounds. The dimensions included:

1) Age differences: The experiment compared progress in creativity and environmental awareness between students aged 10–12 and those aged 13–15. The data revealed that older students showed more significant improvements in creativity, while younger students excelled in cultural understanding.
2) Musical background: The experiment analyzed the progress of students with prior musical training versus beginners. Students with musical training improved more quickly in technical skills, while beginners demonstrated notable progress in creativity and exploratory learning.

To evaluate the long-term impact of teaching strategies, follow-up tests will be conducted three months after the end of the course. The results indicated that students' creativity and environmental awareness remained at high levels, although some showed a slight decline in cultural understanding [31]. This suggests that while virtual tools and interdisciplinary methods are effective, long-term interventions may require further refinement.

This experiment adopts a continuous feedback mechanism to adjust course content and difficulty levels through regular evaluations and student feedback. By combining quantitative surveys with qualitative interviews, teachers can track students' changes in various dimensions and optimize teaching strategies. The results indicate that students' grades have significantly improved, especially in terms of personalized teaching and emotional engagement. (see **Table 4**).

Table 4. Stratified analysis of student performance by age group and musical experience.

Evaluation dimension	Age group 1 (10–12)	Age group 2 (13–15)	Beginners	Experienced students
Musical creativity	42	46	40	46
Environmental awareness	41	44	43	44
Cultural understanding	45	43	46	45

8.6. Implications for future music education

The findings from this experiment suggest that integrating cultural and environmental themes with technological innovation in music education can effectively enhance students' creativity, environmental awareness, and cultural understanding. The application of interdisciplinary methods, particularly the adoption

of virtual tools, not only fosters sustainable learning models but also increases student engagement and critical thinking.

In the future, educators need further integrate these interdisciplinary strategies into curriculum design to meet the demands of global sustainability. The innovative teaching methods mentioned above can provide students with a more holistic learning experience and prepare them for future educational and ecological issues. As technology continues to advance, global cultural exchanges continue to deepen, educators must explore the potential of emerging technologies, such as AR and VR, to further enrich the content and methods of music education [32].

By integrating technological innovation, interdisciplinary methods, and virtual tools, music education can play a vital role in fostering students' cultural understanding and environmental sustainability. The experimental data further indicate these strategies not only improve students' musical creativity but also raise their awareness of global ecological issues and cultural diversity. As the world moves towards a more sustainable future, educational systems must continually evolve to ensure that the next generation can actively contribute to addressing the complexities of a rapidly changing, ecologically fragile environment.

9. Conclusion

In the context of the new normal, music education is encountering both challenges and opportunities. Substantial shifts in educational philosophy and practice are urgently needed. The experimental results from this study affirm that integrative teaching strategies, combining virtual tools and interdisciplinary approaches are pivotal in enhancing students' overall competencies, creativity, and cultural understanding. This new approach is crucial for adapting music education to the rapidly evolving demands of a globally interconnected world.

The adoption of digital technologies, such as virtual instruments and collaborative platforms has significantly altered the traditional delivery of music education. As demonstrated by experiments, the integration of environmental and cultural themes, driven by technology, greatly enhances students' creativity, environmental awareness, and cultural understanding abilities. This transformation highlights the necessity of an education model that is not limited to the development of technical skills, but also includes critical thinking and cultural empathy, which are crucial for cultivating global citizens.

Educators must now embrace the principles of constructivist learning theory, which emphasizes active learning and the construction of knowledge through experience. As the experiment showed, students who engaged in interdisciplinary and project-based learning activities demonstrated higher levels of engagement and creativity. By embedding music education within real-world contexts—such as environmental soundscapes and cross-cultural music traditions—students not only improved their musical skills but also developed a deeper understanding of complex global issues.

However, this transformative process presents certain challenges, as highlighted by the experimental analysis. Teachers must adapt to new roles as facilitators of knowledge rather than merely transmitters of information. The diversity of student

needs, backgrounds, and learning styles requires a flexible and individualized approach to teaching. The stratified analysis in this study underscored that different age groups and students with varying musical backgrounds responded differently to integrative strategies, suggesting that personalized learning pathways are essential for maximizing student growth.

Furthermore, the experiment underscored the importance of continuous feedback mechanisms. Regular assessments and student feedback allowed for real-time adjustments to the curriculum, ensuring that the teaching strategies remained relevant and effective. This feedback loop not only improved student outcomes but also fostered greater emotional engagement, as students felt more invested in their own learning process. Future music education systems should capitalize on these feedback mechanisms, using data analysis tools to monitor and enhance student progress.

Collaboration between schools and communities has also become a key factor in the success of integrated teaching strategies. Experiments have shown that collaboration with local organizations enriches students' music education experience. These collaborations also provide students with opportunities to apply them in the real world. Cross cultural cooperation, such as collaboration between Asia and Europe, demonstrates the potential for mutual learning and exchange of best practices in music education reform. Music education must strike a balance between preserving local cultural heritage and embracing foreign influences. The findings from this study emphasize the need for a curriculum that promotes cultural diversity and educational equity, while also preparing students for the challenges of a globalized world. Sustainability must be central to this future vision, both in terms of environmental awareness and in the long-term adaptability of educational practices.

The shift towards integrative teaching strategies is not just a response to the current educational landscape but also a forward-looking approach that prepares students for future challenges. By continually exploring new pedagogical methods, leveraging technological innovations, and fostering interdisciplinary collaborations, music education can provide a more holistic and meaningful learning experience. This proactive response to the new normal will ensure that music education remains dynamic and relevant, cultivating a new generation of students with the skills, creativity, and global awareness needed to thrive in the 21st century.

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References

1. Xing N. Discussion on the path of corporate legal risk management from the perspective of the new normal. Legality Vision. 2023; (14), 157–159.
2. Li Y. Exploration of elementary English picture book teaching strategies from the perspective of in-class and extracurricular integration. Love Science Education Frontier. 2023; (03), 188–190.
3. Zhang S. Research on the effectiveness of China's central bank's monetary policy under the new normal—Based on the perspective of economic growth. Productivity Research. 2021; (10), 127–131+161.
4. Guo J. China's monetary policy under the "new normal." Marketing Circles. 2021; (04), 38–39.
5. Luo S, Yang J, and Xu Q. A brief discussion on "streamlining administration and delegating power" under the new normal. Legality and Society. 2021; (19), 98–99.

6. Zhang X. A survival guide for enterprises under the new normal of the pandemic. Chinese and Foreign Corporate Culture. 2022; (08), 5–8.
7. Su W. Discussion on countermeasures for the integration of information technology in coal enterprises under the new normal. Modern Industrial Economy and Informationization. 2022; 12(10), 53–54.
8. Huang L. Exploration of junior high school Chinese teaching strategies from the perspective of "reading-writing integration." Chinese Excerpts Teacher's Edition. 2023; (12), 112–114.
9. Shi F. Network and security integration under the new normal of the pandemic. China Informatization. 2021; (05), 82–83.
10. Dan Z. Reflections on the integration of production and education in higher vocational education under the new normal. Scientific Consulting Science & Management. 2021; (03), 188–189.
11. Du T. Acceleration of civil aviation mixed reform under the new normal. Big Aircraft. 2021; (01), 18–23.
12. Wu S, and Hu Y. Integration and win-win: A study on the adaptability of cloud accounting models for small and medium enterprises from the perspective of social adaptation theory. Modern Business. 2021; (18), 190–192.
13. Ye T, Zhao Y, Wang X, Ling Y, Jiang G, and Wang H. Research on social adaptability from a health perspective. Chinese Journal of Social Medicine. 2023; 40(01), 24–26.
14. Li K, and Wang J. Interactive teaching strategies under the concept of integrative music classrooms. Music World. 2021; (09), 10–13+5.
15. Jiang W, and Bu L. Integration of practicality and aesthetics in elementary music education under the "double reduction" policy. New Curriculum Teaching Electronic Edition. 2023; (18), 100–102.
16. Li M. Circular economy of financial debt credit payment chains under the new normal. China Collective Economy. 2021; (05), 103–104.
17. Fu L. High-temperature heat waves may become the new normal under the background of global warming. Science and Technology Daily. 2022; (002).
18. Du Q. Research on the integration mechanism of vocational education and production under the new normal. Occupation. 2021; (11), 32–33.
19. Kadeer Y. Deepening the integration of vocational technical school dance teaching with production and education under the new normal. In Exploring Curriculum and Teaching Reform under the "Double Reduction" Policy, 13th ed. New Curriculum Research Journal. 2022; 121–122.
20. Sun Y, and Ding H. Research and practice of constructing the "new normal" of online teaching from the perspective of "golden courses." Modern Business and Trade Industry. 2022; 43(15), 213–215.
21. Wang H. Discussion on the new form of intelligent labor education from the perspective of disciplinary integration. Middle School Biology Teaching. 2022; (31), 17–20.
22. Cai Y. Research on the path and strategies of vocational education's proactive adaptation to the economic new normal under the "Internet Plus" concept. Journal of Beijing Institute of Graphic Communication. 2021; 29(10), 104–106.
23. Huang F. Research on the reform of basic music education from the perspective of core literacy. In Proceedings of the Third National Education and Teaching Seminar. Chengdu Tao Xingzhi Research Association. 2022; 32–36.
24. Li Y, Liu Z, Guo M, and Gu X. High-temperature heat waves will become the new normal under the background of global warming. China Meteorological News. 2022; (001).
25. Wang G. Practical design of teaching strategies for "high school mathematics teaching design" under the new normal. Mathematics Learning and Research. 2022; (33), 26–28.
26. Liu J. Integration and development of science and technology journals and short videos under the new normal. Technology and Innovation Management. 2021; 42(05), 601–606.
27. Chen B. Some discussions on ideological and political education of college students under the new normal. Food Research and Development. 2022; 43(23), 239–240.
28. Smith A. Adapting music education to digital transformation: Strategies and challenges. International Journal of Music Education Research. 2024; (25), 123–135.
29. Johnson B. Cross-cultural music education in the post-pandemic era: Opportunities and dilemmas. Global Music Education Review. 2024; (18), 89–102.
30. Brown C. Integrative teaching methods in music education: A case study from Europe. European Journal of Music Education. 2024; (22), 78–91.

31. Davis D. Technological innovation in music education: Impact on student creativity and engagement. Journal of Music Technology Education. 2024; (20), 156–170.
32. Wilson E. School-community collaboration in music education: Successful models from around the world. International Journal of Community Music. 2024; (23), 211–225.