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Exploring Music Teaching Methods Through Core Literacy: A Deep Learning Approach with Implications for Cognitive and Emotional Development in Sports

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Abstract
Core literacy encompasses the essential skills and abilities students need to effectively adapt to and thrive in society. Developing core literacy during the teaching stage is a critical component of implementing moral and holistic education in schools. In the context of music education, a teaching model centered on core literacy is vital for enhancing the overall quality of instruction and fostering deeper cognitive and emotional engagement. This study explores music teaching methods through the lens of core literacy, utilizing deep learning approaches to reform traditional teaching practices. Deep learning encourages students to go beyond the simple application of knowledge points, enabling them to apply their music knowledge to solve complex problems in dynamic learning environments crafted by teachers. This paper examines the potential of these methods to improve music education quality, emphasizing the integration of cognitive, emotional, and collaborative skills. In the context of sports psychology, these findings highlight parallels between music and sports education. Both disciplines benefit from strategies that promote critical thinking, emotional resilience, and teamwork. By applying these principles, educators can foster holistic development, enhance performance, and support lifelong learning in both music and sports settings. This research aims to inspire innovation in teaching methods for those invested in educational reform.
Keywords: Deep Learning, Core Literacy, Contextual Analysis, Affective Teaching.

1. Introduction

In recent years, the education industry has developed very rapidly, taking basic skills as the material form of party class teaching and as an external form of expression, linking the macro teaching concept with the talent development goal (Julia et al., 2019). Exploring the prospect of music teaching reform based on basic knowledge can not only effectively improve the quality of music teaching, but also improve students' interest in music learning to a certain extent (Rong, 2021). Therefore, in order to optimize music teaching in primary schools, it is necessary to analyze the reform of music teaching from the perspective of in-depth learning to basic skills (Biasutti et al., 2019). Deep learning, or deep learning, is a learning concept proposed by American scholars for students' shallow learning, and the concept of deep learning appeared in 1976 and has been continuously improved and updated to form today's deep learning system. When deep learning was examined, it had a great impact on the field of intelligent information, and in its gradual improvement, today's deep learning is extremely important in the education industry as well (Cai et al., 2019; Wang et al., 2022).

In China, deep learning started in 2005, (Huanyuan, 2022) defined deep learning in Chinese, that is, to critically go to learn new and correct ideas under the prerequisite of understanding learning, and to combine the new ideas with the original cognition in the learning process, and the already acquired knowledge can be applied in other decisions and problems through knowledge transfer. The national deep learning project team subsequently made further refinements to the concept of deep learning, which is a teacher-led full engagement of students in challenging learning topics, during which students will gradually acquire core knowledge of the topic and develop positive motivation to learn (Chandra et al., 2018). The Organization for Economic Cooperation and Development has studied core literacy extremely deeply, and the core literacy it proposes includes the ability to use external forces, the ability to communicate within a group, self-awareness and other abilities (Saghezchi et al., 2013). The core literacy has been gradually improved in the process of development of the European Union to become a core literacy that includes eight systems such as native language and foreign language communication. The understanding of core literacy tends to vary from country to country, and in China, the three main directions of cultural foundation, autonomous development and social participation are summarized at the level of core literacy, which can enable students' abilities to be better developed through a careful division of core literacy (Shang, 2022).

For students' educational work, the improvement of core literacy is exactly the important pursuit of educational work, and if we can strengthen the

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cultivation of core literacy from the perspective of deep learning, we can effectively improve students' learning effect and bring help to students' future learning career (Palanisamy et al., 2021). The connection between deep learning and core literacy is very strong, and in the field of education, they complement each other and can lead to significant improvement in teaching quality (Matyakubova, 2021). Deep learning is the foundation for the successful implementation of core literacy, which is a collection of skills and attributes necessary for students to use deep learning to enrich their core literacy and to develop their own style in life and learning (Alsubari et al., 2022). For student education, core literacy is the goal to explore when carrying out deep learning, for example, in music teaching, content such as music appreciation and instrumental music are the bearers of core literacy, and teachers can help students open deep learning to broaden their thinking and ideas, and try to improve their personal core literacy in learning (Tan et al., 2021). Therefore, the relationship between deep learning and core literacy is extremely close and deserves to be studied in depth by many educators.

2. Related Work

The music teaching method is discussed through the approaches and perspectives of speech rhythm, breathing, voice training and music localization, which provides a reference for the diversity of teaching methods in the classroom of high school "singing" module (Bansode et al., 2016). The Kodály Method - Comprehensive Music Education is a systematic introduction to Kodály's ideas of music education, including the Corwin gesture, rhythmic and chant intervals, and first-tone chanting, which are useful for the development of aesthetic perception of music and aids in the rise to cultural understanding. These ideas are useful for the development of aesthetic perception of music and as an aid to cultural understanding (Navbakhor, 2020). In (Al-Mekhlafi et al., 2020), they interprets music from a philosophical perspective, focusing on the "inner nature" of music and the "authenticity" of the aesthetic experience. This idea led this paper to look at the teaching of the "singing" module from the perspective of aesthetic perception of music. This has contributed to the development of this paper's vision and the enrichment of teaching methods. In (Lin & Li, 2021), it is mentioned that singing is the human body as a musical instrument, and it talks about the structure of the human body, the vocal cords, the form, breathing, and vocalization. It plays a role in assisting this paper to scientifically study the characteristics of high school students' singing and the attention to singing styles (Abd Algalil & Zambare, 2016).

In (Al-Azab et al., 2022), they systematically introduces philosophical considerations in the implementation of the school music curriculum and the need for music education to focus on music practice activities. As a compulsory module, the "Singing" module focuses on improving students' core music literacy through singing activities. This book gives us a great deal of support in how to implement the "singing" module into the music classroom through practical music activities. All of these music education systems and approaches to teaching singing are based on different perspectives and dimensions, but ultimately, they are based on music practice. The "singing" module, as the most important module of music practice, has the widest coverage and the greatest universal value, and therefore deserves to be studied. The results of these studies provide some insight into the implementation of the "singing" module in this paper, allowing us to gain a deeper understanding of singing and its humanistic connotations (Abdumutalibovich, 2022). The teaching theory of (Alqahtani et al., 2022) provides strong theoretical support for the teaching practice of the "singing" module in high school music classes. In his book Music Pedagogy in the General School, he mentions that "adolescence is a period of rapid physical and intellectual development" and that high school students are at a special age when they have a strong desire for knowledge. They have their own ideas and opinions about the aesthetics of music. They use their own musical attitudes to express music and may even create new music. High school students have the ability to perceive the beauty of music in their singing and to experience the emotional and humanistic connotations behind it.

In (Ali et al., 2015), they edited a book about music education, teachers and students, and approaches to music studies from philosophical, aesthetic, anthropological, historical, and pedagogical perspectives. This book gives this paper a more multidimensional perspective on teaching the "singing" module in high school music. It is a useful aid in the selection of specific teaching approaches for this paper. In (Ibrokhimovich, 2022), it is mentioned that teenagers should pay attention to scientific vocalization, normal breathing, correct posture, reading the content of the song, and adjusting the psychology of singing. In (Bentler, 1987), the aesthetics of song is proposed as "three-dimensional grasp, layered feeling" and "multi-colored repertoire, colorful chorus". This book makes this paper focus on the role of chorus in the "singing" module of music. In this paper, we will not only focus on the musical elements such as tune, pitch, intensity and tempo of songs, but also on the non-musical elements such as lyrics and humanities. This paper has been inspired by the question of how students can achieve cultural understanding through the perception and experience of musical and non-musical elements, and has been

theoretically supported by this paper in concrete teaching practice.

3. Exploration of Music Teaching Methods Based on Deep Learning in the Core Literacy Perspective

3.1 Deep Learning Theory

Deep learning is the basic way to develop students' core literacy, which is different from shallow learning, as shown in Figure 1.

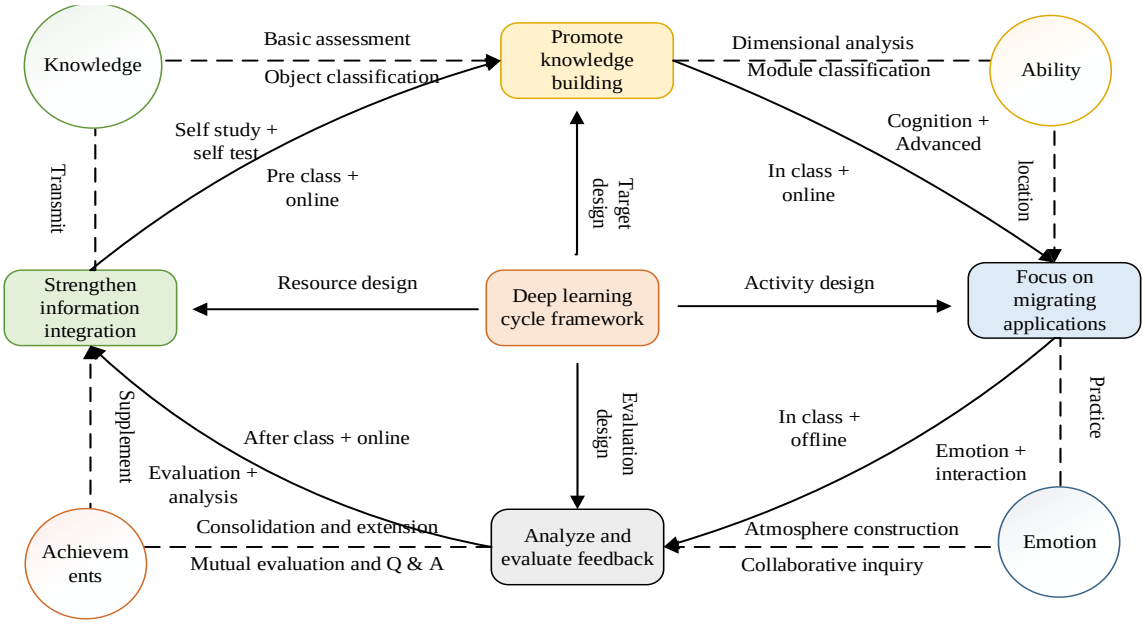

Figure 1: Deep learning ability cycle training model

The model contains 4 modules, and the teaching purpose and ability training of each module form a virtuous teaching cycle ecology through a gradual, first and last correspondence. (1) Knowledge to ability module focuses on developing students' independent learning with teaching resources and building a systematic thinking of cognitive level and knowledge system. (2) Ability to emotion module is intended to help teachers and students create a good experience of interaction and collaboration in design practice. (3) The Affective to Outcomes module is designed to guide students to understand the criteria for judging the effectiveness of learning. (4) The Outcomes to Knowledge module aims to urge teachers and students to effectively supplement and improve the course resources. Students can learn more about the core knowledge, application forms, articulation and assessment methods in different teaching sessions, and correspond to their project nodes and professional points in design practice, so as to make more accurate learning plans and energy allocation. For example, for the skills training and quality development required to master the knowledge points before, during and after the course, students can understand from a more systematic perspective the importance of each effort and goal to the construction of their own learning system. With the help of teachers' guidance, students build "emotion" and "cognition" in three dimensions: depth of discipline (core literacy, teaching effectiveness), depth of thinking (anchoring higher order, teaching breadth), and depth of interaction (learning style, teaching temperature) from the aspects of perception, thinking, emotion, and will. Students are guided and assisted by teachers to fully participate and use their emotions to understand the music learning process, master music knowledge and skills, acquire appropriate learning methods, and develop motivation and values (See Figure 2).

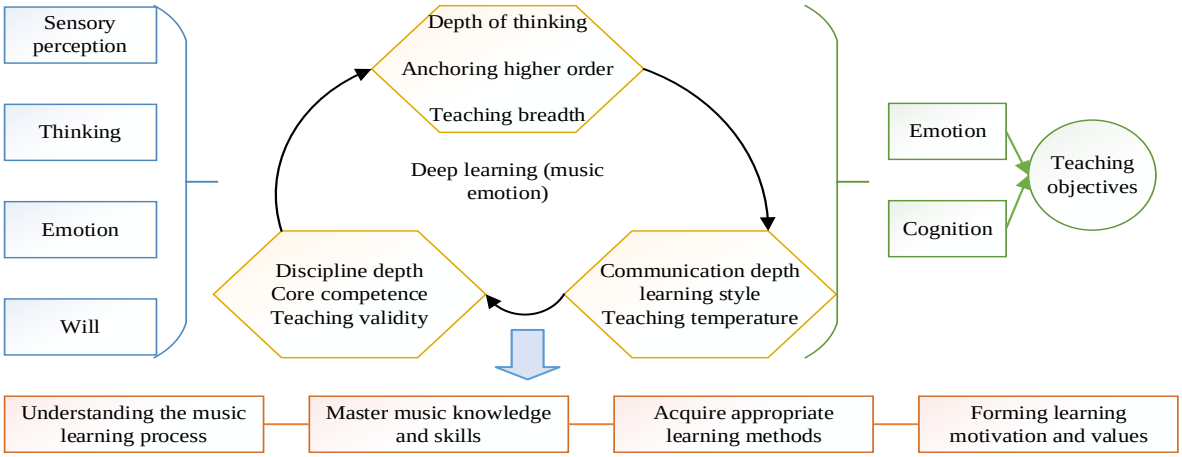

Figure 2: Music deep learning architecture

Emotion is one of the basic features of aesthetic education, which exists in aesthetic activities such as feeling, appreciating, expressing and creating. As a carrier of emotions, the process of music reflects the expression, impact, catharsis, and communication of emotions. Although music as a carrier of emotions is called "the most emotional art," not every student can fully feel and experience the aesthetic emotions in it because of its non-semantic nature. Students need to go through the process of mental activity, acoustic transformation, imagination, and attempt to express themselves in music, i.e., "perception to reason" and "perception to cognition".

Emotions and feelings need to be expressed through the body, and experiences come from experiences and feelings, which have commonality. In addition, the ability to "empathize" and "put oneself in the place" in daily life is closely related to the "feeling experience" and "imagination and association" in music emotion. "Teachers can promote the "exploration and expression" of music emotions in music teaching (See Figure 3).

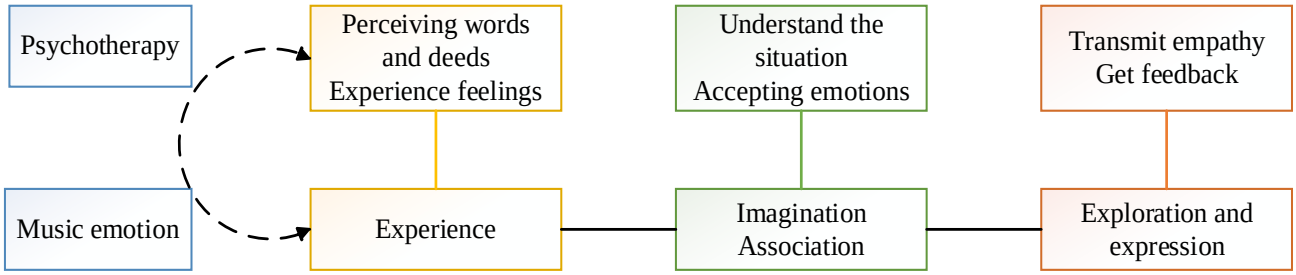

Figure 3: The association between psychological empathy and musical emotion

With reference to the requirement of "encouraging students to express their independent feelings and opinions about the music they listen to" as proposed in the Compulsory Education Music Curriculum Standards, this paper takes a student-centered approach, based on the classroom, breaks the teaching barrier, relies on psychology's "empathy" and other related knowledge, and integrates it into music emotion teaching; adjusts and reconstructs the teacher-student interaction, establishes the "empathy" connection, generates emotional bonds, and forms a "dual integration". In this paper, we take a student-centered approach and break the teaching barrier, relying on the knowledge of "empathy" in psychology and other related knowledge, integrate it into music emotion teaching; adjust and reconstruct the teacher-student interaction, establish "empathy" association, generate emotional ties, and form a "dual-integration" teaching.

Specifically, this paper attempts to divide music emotion teaching into three steps, such as "listening and thinking," "imagining and associating," and "expressing and exploring," and correlates them with the "awareness, experience," "acceptance, understanding," and "transmission and feedback" of psychology. In this paper, we try to divide music emotion teaching into three steps, such as "listening and perceiving", "imagining and associating", "expressing and exploring", and "perceiving and experiencing", "accepting and understanding", "transmitting and giving feedback" in psychology. The "empathic" relationship between teachers and students is "put yourself in the shoes", "empathy" and "two-way mirror", and the design of cascading progressive teaching. At the same time, it also mobilizes students' perception, thinking, emotion, and will to participate comprehensively, leading to deep learning of both "emotion" and "cognition", and laying the foundation for the formation of core literacy (See Figure 4).

3.2 Blended Music Teaching Application Under the Vision of Deep Learning

(1) Resource design: strengthen information integration

Music teaching is an interdisciplinary subject, and its course content has the characteristics of "wide range of points and close connection". Under the current situation of credit system reform and gradual reduction of course hours, the delivery of teaching contents should not only conform to the law of students' cognitive growth, but also meet the dynamic needs of discipline frontier and social development. Therefore, most teachers always want to teach the complete teaching content in a detailed manner to avoid omissions, which will undoubtedly put huge learning pressure on students in a limited time, forcing them to do everything, seemingly busy, but in fact the quality of learning is poor and worrying.

Therefore, teachers should realize that learning from shallow to deep is a continuous process, and they need to optimize the information by analyzing the difficulty level and primary and secondary relationships of the resources on the basis of respecting the existing school hours, arranging and establishing content frameworks and learning paths that can be carried out asynchronously and step by step, creating a multi-channel information environment with human-technology interaction and effective delivery, so as to seamlessly connect when using, quickly and smoothly extract, and promptly solve when in doubt. When in doubt, the answer is timely. This can turn learners' external motivation to learn internally, stimulate their interest in learning, cultivate their self-learning ability, and master the knowledge and skill base required for classroom teaching activities in a more systematic way before the class.

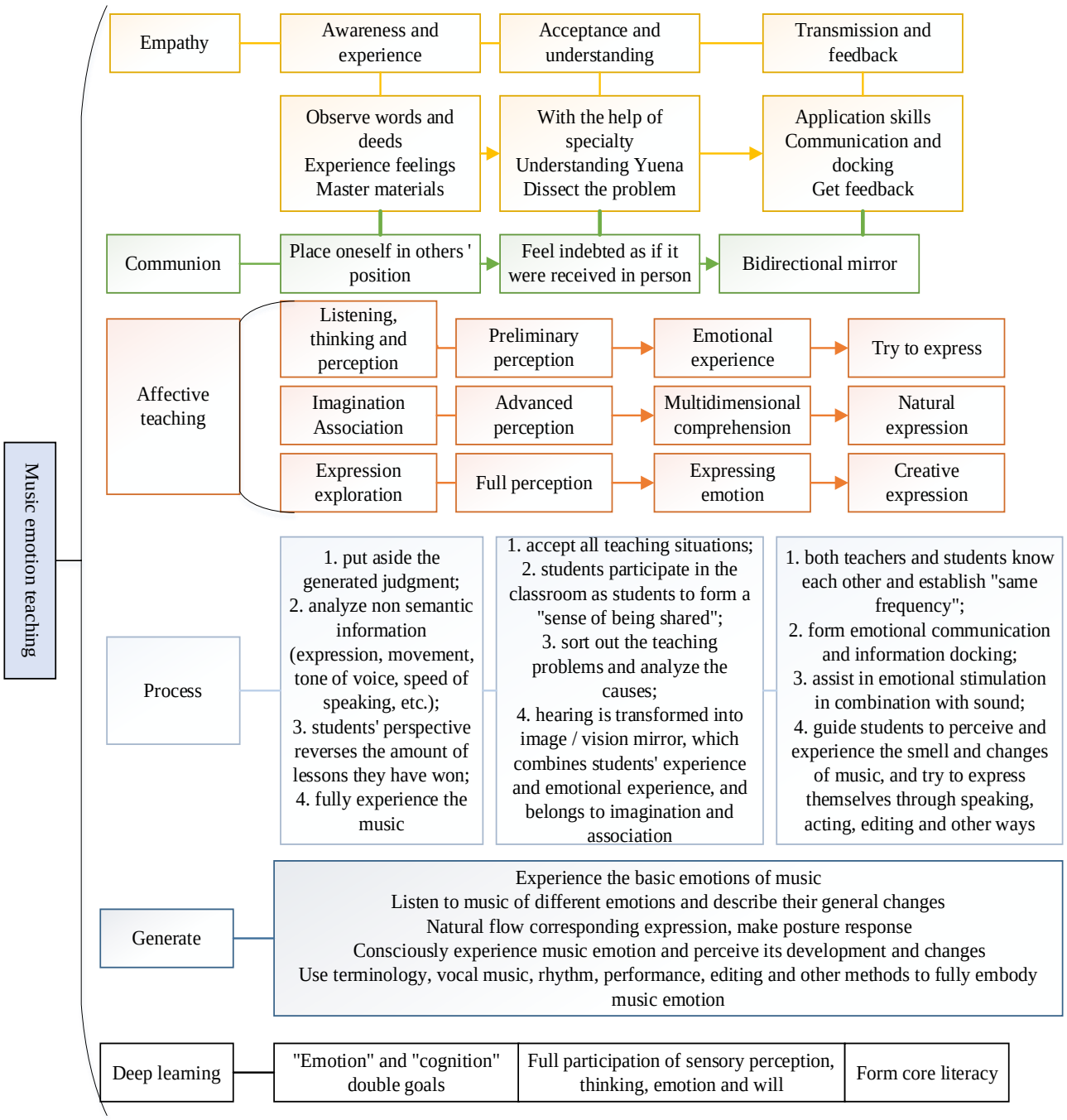

Figure 4: Deep learning design for teaching music emotion

In the pre-class survey, the teacher derived a statistical chart of the class students' academic characteristics, as shown in Figure 5. It was found that more than 79% of the students had good professional foundation, curiosity, information literacy and application level, and had the basic ability to accept blended music teaching. Therefore, based on the 90-minute (two-hour) unit of study, the lesson plan, lesson materials, teaching diary, and self-assessment exercises were analyzed and reorganized, and 60% of the unit of study time was set up as shown in Figure 6, with a number of easy to difficult stages in the form of learning tasks, interactive seminars, case studies, presentations of works, and summaries of diagrams that could be easily visualized in the classroom. The student can use the learning tasks in their own way. Students can choose flexibly and watch repeatedly according to their own learning situation and personal wishes, and gradually complete the pre-study, test questions and questionnaires, and review and consolidate them. At the same time, they can also make suggestions, answer each other's questions and form groups freely in the discussion forum to share and exchange their learning experience, experience and results. Teachers can also observe in real time in the platform to finely manage and guide learners' learning behavior and thinking status, so as to

avoid students losing interest and goals due to the backlog of questions.

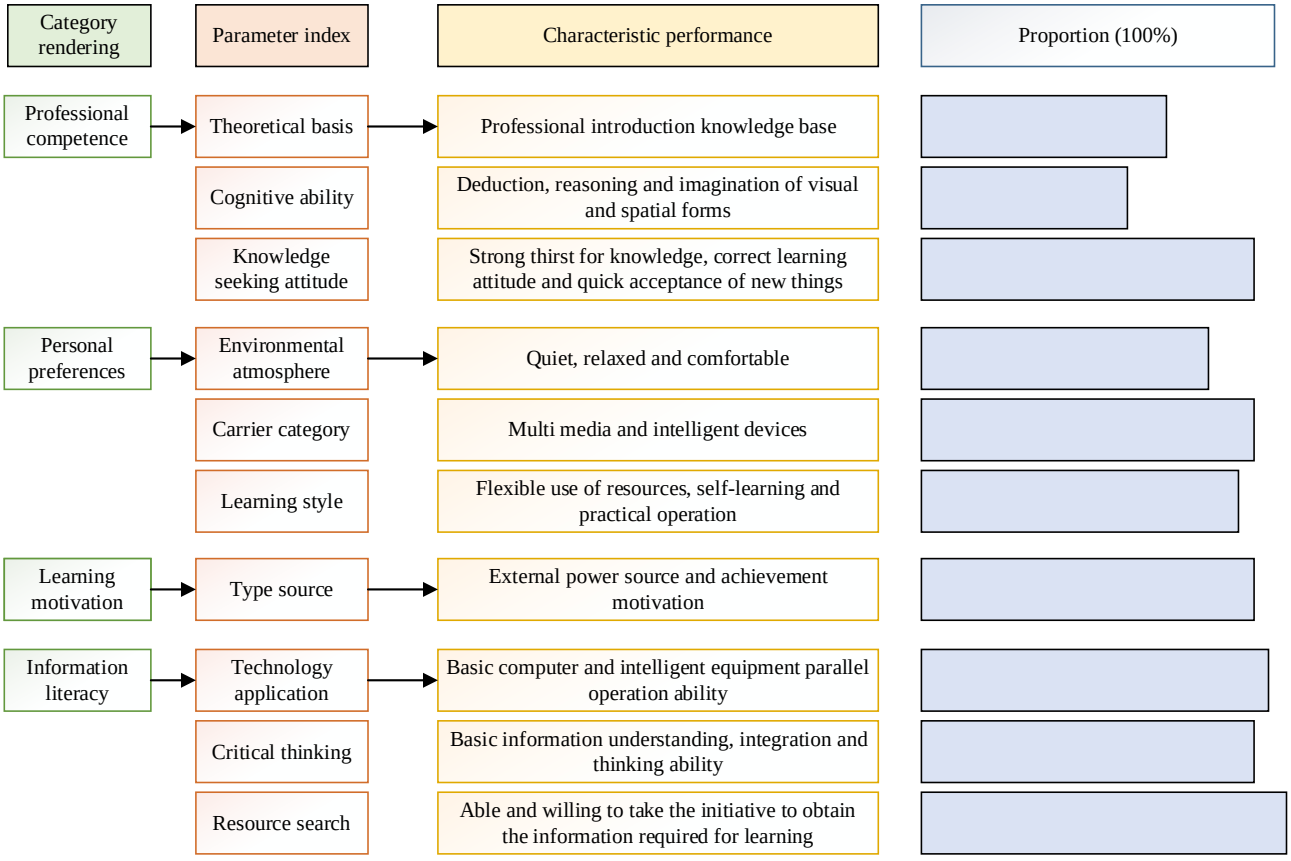

Figure 5: Statistical chart of students' academic characteristics in the class

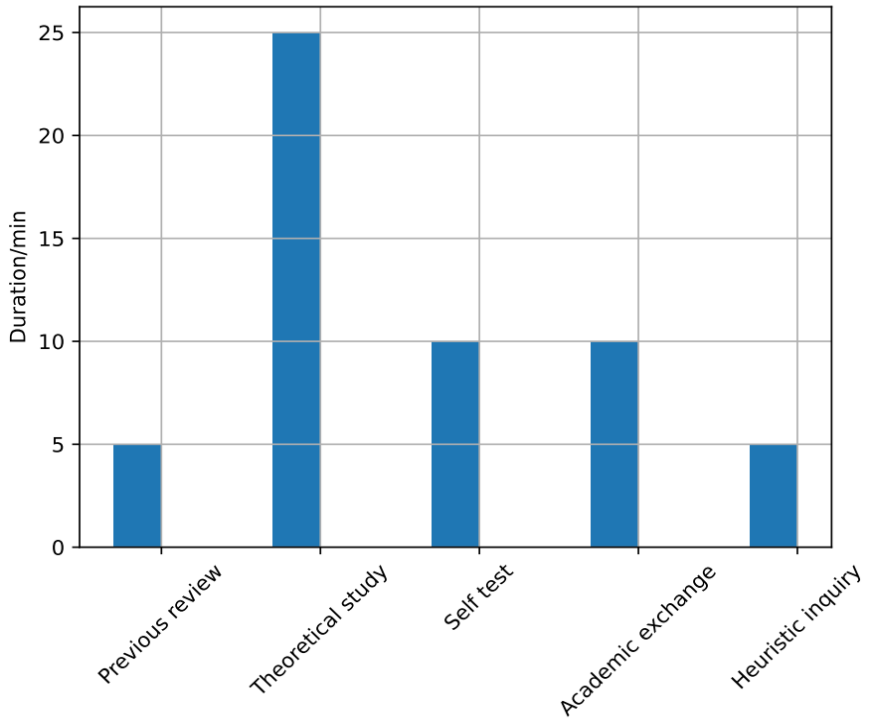

Figure 6*:* Online teaching session content arrangement

The above initiatives not only enabled students to receive concise and accurate course information within the limited class time, but also reserved enough class time for teachers to explain key points and difficulties thoroughly, which reduced students' intimidation and relieved learning pressure, and guaranteed smooth and efficient classroom teaching. Nearly 78% of the students said that the integrated and refined teaching

resources could effectively help them understand the key points and difficulties of the course and the relationship between knowledge, and they were able to study and review more independently and timely before and after class. In addition, the core contents taught by teachers in class can be better cut to the core and discussed in depth, which greatly enhances teaching participation.

(2) Objective design: Promoting knowledge construction

In the blended music teaching model, most of the teaching content is made into digital resources. However, this does not mean that students switch from the classroom to passive learning in front of a screen, but rather that they are drawn deeper into a diverse and rich interactive model. This represents a change in the way most of the teaching resources are distributed, allowing the act of "teaching" to be transformed as much as possible into "teaching and learning". In order to better enable students to understand, critique and integrate the knowledge they have acquired, and to clarify the achievement of their personal learning goals, the growth of their abilities and the concrete results of their in-depth learning, teachers can reconstruct the previous knowledge system, using the stages of music teaching practice as clues to design content and questions. And refine and integrate the driving methods of their project needs, help students climb gradually along the conceptual framework, and connect the knowledge in a vivid and easy-to-understand presentation.

At the same time, by combining the pyramid principle of learning, Bloom's classification theory of teaching objectives and the 3D-driven teaching method, the 45 knowledge points in the 6 chapters of the course are integrated into a system built by the 4 dimensions of knowledge, cognition, attitude and retention, expecting students to establish a complete workflow framework for design projects and to be familiar with the designer's job responsibilities at different stages. The work responsibilities of designers at different stages. The knowledge of the back and forth, application and innovation of the knowledge will be integrated into the other dimensions accordingly. Eventually, the teacher can conduct quantitative and qualitative analysis based on the acquired learning trajectory and goal accomplishment of the learners, form a summary report. Similarly, this model can be used for any knowledge point in the course to help teachers understand the differences in students' abilities, provide them with targeted learning objectives, training activities and evaluation criteria, guide students to discover the extent of their knowledge transfer and the development of their deep learning ability, and stimulate learners' desire and motivation to learn. In addition, teachers can show the dynamic improvement of different students' ability dimensions in different learning stages, so that students can take the learning quality of classmates as a reference and know more clearly the quality of their own knowledge construction and learning objectives completion, so that they can take the initiative to communicate and ask for advice among teachers and students during the course. Nearly 76% of the students said that after the quantitative and qualitative assessment of the completion of teaching objectives, learners can have a clear comparison of their own ability matrix with others, so they can analyze their own shortcomings in various aspects.

4. Case Study

According to the content of the textbook, this paper combines the three steps of teaching emotion with the three main approaches analyzed from the perspective of deep learning in psychology ("awareness, experience", "acceptance, understanding", "transmission The three dimensions of deep learning ("depth of discipline," "depth of interaction," and "depth of thinking") are correlated with the three main ways of deep learning perspective analysis ("awareness, experience," "acceptance, understanding," and "transmission," "feedback"), and the teaching sessions are designed accordingly. This paper analyzes the deep learning perspective of music emotion teaching. In this paper, we analyze the lower elementary grades. Students in lower elementary school are young, emotionally pure, with limited cognitive ability and lack of life experience, so they are required to try to experience music emotions, listen to different emotions, and try to express music emotions through language descriptions and singing performances. "This song is a lullaby with a beautiful lyrical tune and innocent and warm lyrics, depicting a quiet night with stars and moon in the sky, and a baby falling asleep in its mother's sweet song in a lullaby.

(1) Preliminary perception: Listen to the music for the first time, perceive the mood as a whole, and try to describe it in simple language, focusing on the first phrase (see figure 7), which depicts the scene of the baby "sleeping in the cradle and smiling", to understand the basic mood. The teacher can use the "awareness and experience" in the deep learning perspective analysis to assist teaching by putting aside immediate subjective judgments about the students' learning production and carefully observing their learning status, paying attention to non-semantic information (e.g., mannerisms, movements, vocal tones, etc.), especially for students who are relatively slow and weak in music response and perception. Afterwards, teachers switch to students' perspectives and empathize with them by observing the classroom in reverse, sorting out and analyzing students' learning generation to prepare for subsequent teaching adjustments.

Figure 7: Pedigree example 1

(2) Emotional experience: Create a situation and analyze the whole song. That is, through life experience, capture the music image, create the learning scene of "quiet night, bright moon and stars", and further guide students to perceive and experience the mood change of the music through teaching and singing. At the same time, focus on analyzing the second phrase (see Figure 8) and imitating the rhythm of the song, imitating the "gentle cradle", imagining and feeling the gentle and light image of "mother" in the music, and trying to sing with a soft and beautiful tone. Teachers can use "acceptance and understanding" in the deep learning perspective analysis to assist teaching, accept and understand the immediate state of teaching, and generate "being with". Then, students are guided to use their imagination and association with their life and emotional experiences to transform their hearing into musical images and figurative scenes. At the same time, we focus on observing students who sing mechanically, and then we switch to participate in the classroom as students in reverse, to sort out the immediate teaching problems and analyze the causes.

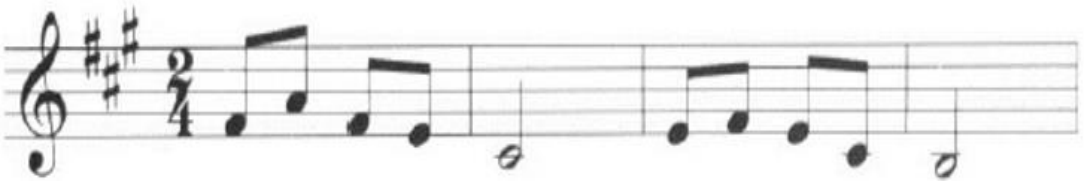

Figure 8: Pedigree example 2:

(3) Try to express: Sing the song in its entirety and try to match it with your favorite movements to express the mood of "Sweet Dreams". At the same time, focus on creating the third phrase (see Figure 9) to express the scene of the mother gently lulling the baby to sleep and the baby sweetly falling asleep, and choose a suitable classroom instrument, listen to the tone and adjust the intensity to accompany the piece.

Figure 9: Pedigree example 3:

Teachers can use the "transfer and feedback" in the deep learning perspective analysis to assist teaching. Firstly, while observing the class as a student, so as to clarify the teaching aspects that can be adjusted and improved, forming a "two-way perception" between teachers and students. Secondly, the teacher further promotes the docking of classroom information and the flow of music emotions with students to establish the "same frequency" between teachers and students. Again, the integration of context, sound, graphics, and teaching aids can help stimulate the emotions of the music and guide students to perceive, experience, and try to express the emotions and changes contained in the music. Further, evaluation feedback is an important lever to promote deep learning throughout the blended learning process. Instead of presenting teachers' subjective judgments through scores, evaluation requires recording and analyzing data on the whole process of teaching and learning behavior. It is necessary to change from an empirical assessment focusing only on results and objectives to a developmental assessment focusing on stages and reflections, so that it cannot only evaluate students' learning and teaching effectiveness in an objective and evidence-based manner, but also serve as a basis for improving teaching programs, updating teaching modes, and enhancing learning effectiveness. Based on the teaching concept and management system of blended music teaching, we have established an effective formative assessment system by combining structured and indexed evaluation rules, and integrating multiple settings and participation of teachers and students, human and machine, and internal and external participants. The total grade is divided into two major parts: online + before and after class, and offline + during and after class, including regular and final grades, four assessment modules, eight types of evaluation methods, and a total of 22 evaluation indicators. The information technology in the classroom is used to manage and retrace the process in batches, and to evaluate the students' ability to "internalize and absorb" new knowledge in order to achieve a harmonious integration of scale and individuality. Since the mastery of professional basic

knowledge and skills in this course depends to a large extent on the gradual accumulation of regular assignments, design research and project practice. Therefore, the system aims to guide students to enter the course with a low threshold at the beginning, gradually adapt to the characteristics of the course, build up learning confidence, obtain positive feedback, change from "solo" to "group" learning, promote the learning culture of autonomy, cooperation and inquiry as the theme In addition, students are trained to think differently, cooperate and compete, and are deeply involved in every aspect of teaching and learning, and their progress in each competency is tested for final evaluation. Nearly 72% of the students believe that the multiple and specific assessment methods are effective in guiding learners to focus on the articulation of each learning stage and content, and to objectively and comprehensively recognize the strengths and weaknesses of their own learning. At the same time, it does not cause students to lose their motivation to continue and advance in their learning because of the frustration of not performing as well as they would like at a certain stage. The effect of blended music teaching practice in the deep learning perspective is as follows: 198 valid questionnaires were collected from the class of 2018 music teaching students using the data statistics and analysis function of the classroom, and the sample results were integrated from the students' perspective for the following 3 aspects. As shown in Figures 10~12, nearly 76% of the students were satisfied with the application effect of the deep learning ability cycle training model, nearly 78% of the students obtained a deeper learning state, and those who invested more than 81% of the total time in blended music learning could generally achieve good grades and final grades, while those who spent less than 61% of the time generally hovered in the middle range, with individual grades in the poor range. The students who spent less than 61% of their time were generally in the middle range, and some of them were in the poor range. This shows that students who are more receptive and engaged in blended music learning also have significant positive feedback on the effectiveness of deep learning and grade improvement. The above data prove that, thanks to the application of blended music teaching in the deep learning perspective, most students gradually learned to use the classroom platform to allocate their time rationally and strengthen their self-control under the driving force of the tasks before and after class, and spontaneously used the teaching resources to actively learn, share, actively practice, consolidate practice, collaborate and explore, complete their works, and deepen their cognition, so that their thinking activity, learning immersion, and enjoyment increased. The students' thinking activity, learning immersion and pleasure are enhanced, and a deep learning state is gradually formed.

In this process, students gain explicit benefits, mainly including course credits, research reports, program works and dynamic analysis of their ability growth. At the same time, students also have implicit benefits, i.e., in-depth mastery of the course knowledge system, the sense of accomplishment when the results are communicated and presented, etc. In addition, the study also helps teachers improve their ability to apply information technology, better control the teaching process, pay attention to students' learning status, analyze their cognitive patterns and learning characteristics, so as to continuously optimize teaching contents, innovate teaching methods, improve teaching experience, enhance teaching efficiency, and reasonably "transform" professional knowledge into students' The teaching process will be continuously optimized, the teaching methods will be innovated, the teaching experience will be improved, the teaching efficiency will be enhanced, and the professional knowledge will be "transformed" into professional skills.

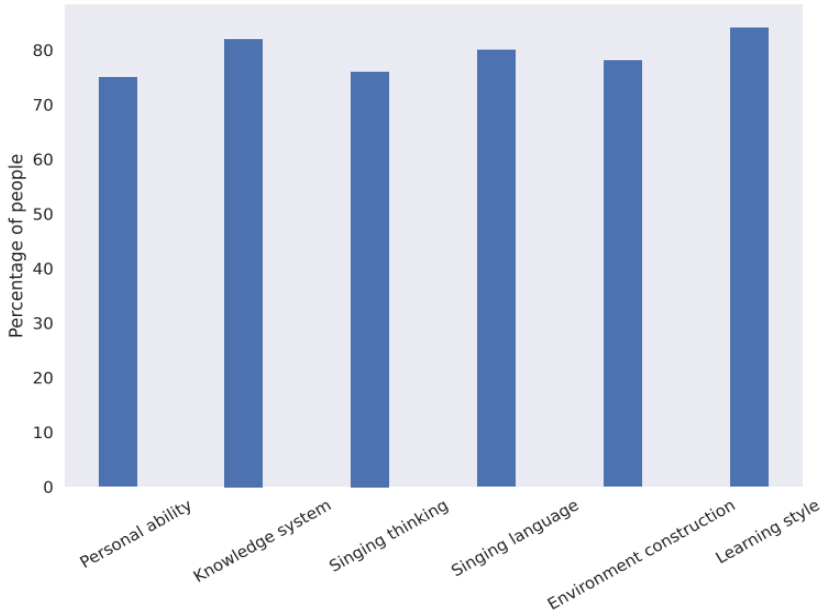

Figure 10: The statistical diagram of the improvement of the deep learning ability of the course

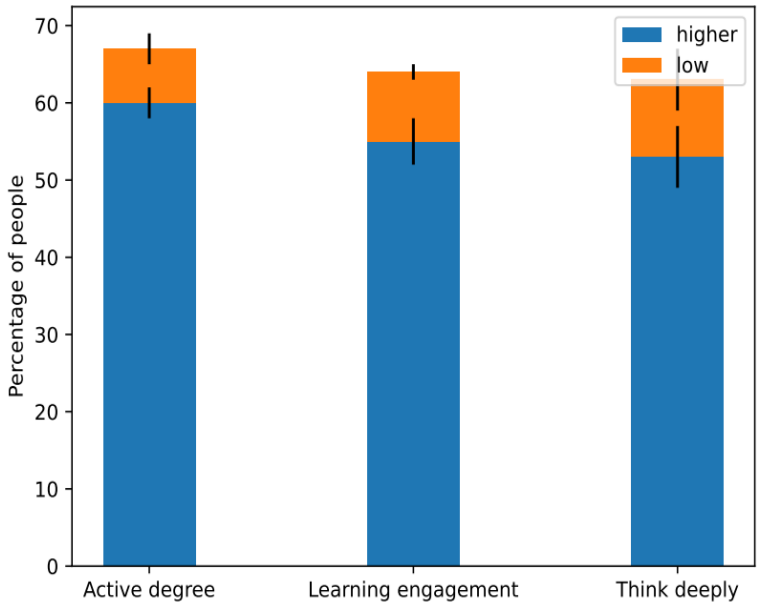

Figure 11: Schematic diagram of deep learning state statistics

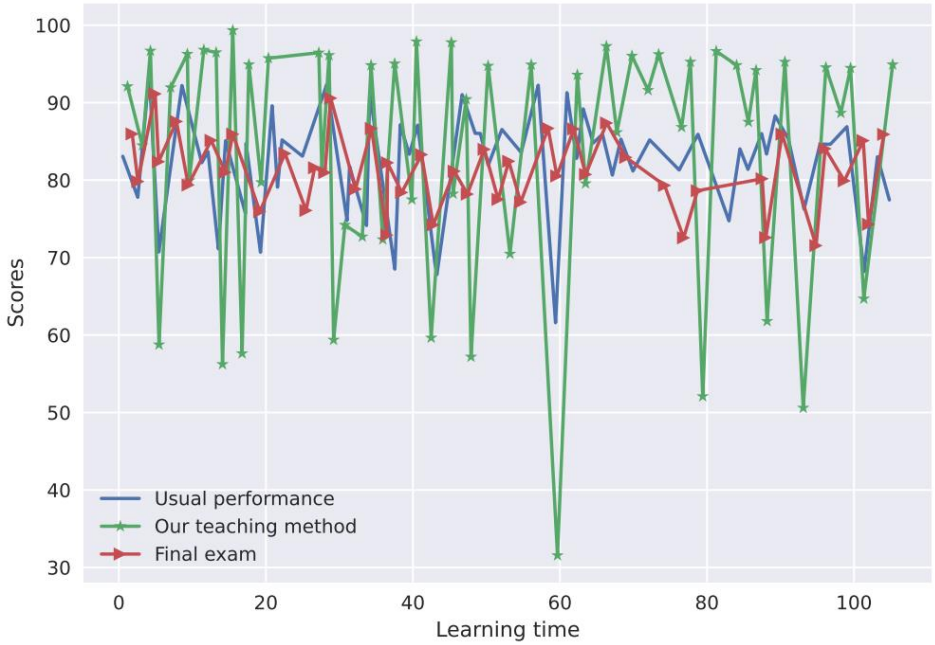

Figure 12: Schematic diagram of the association of blended music learning time spent with regular grades and final grades

5. Conclusion

The music curriculum needs to be combined with national music textbooks to develop teaching activities, and because of the small amount of class time and the large number of pieces to be studied each semester, many schools have the problem of studying one new piece per music section. This is not conducive to deep learning because students tend to lose interest in music through monotonous music learning.

In conclusion, the connection between deep learning and core literacy in music teaching is extremely close, and the quality of music teaching can be significantly improved by reforming traditional teaching methods and using deep learning to improve students' core literacy. I believe that as more people understand the importance of deep learning, music teaching will definitely become better.

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