

Developmental Characteristics of Musical Ability in High School Students

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Abstract: This study focuses on Chinese high school students and explores the developmental characteristics of musical ability and its influencing factors. The research found that the high school stage is a critical period for the formation and enhancement of musical ability, with students exhibiting multidimensional development in areas such as perceptual aesthetics, skill cognition, emotional expression, and cultural understanding. Musical ability is influenced by various factors, including cognition, emotion, socio-cultural context, educational policies, and teaching practices. Although the "Double Reduction" policy has increased the emphasis on arts education, issues such as a narrow curriculum, lack of creativity, and limited teacher capabilities persist. Gender differences and family cultural capital significantly affect students' music preferences and learning opportunities, while teachers' philosophies and curriculum design are crucial for enhancing musical ability. The study suggests establishing a scientific music ability diagnostic system, improving teacher training and curriculum innovation, and promoting the transformation of music education toward a comprehensive literacy-oriented approach, providing theoretical and practical support for high school music education reform.

Keywords: Musical Ability, Developmental Characteristics, High School Students, Cognitive and Emotional Development, Educational Reform.

1. Introduction

Musical ability is a comprehensive manifestation of various skills and competencies that individuals demonstrate in the field of music, including pitch recognition, rhythmic perception, harmony understanding, music composition, and performance. It is not only an essential foundation for music learning but also a concentrated reflection of students' aesthetic perception and creative thinking abilities (Hallam, 2010). In high school, students are at a critical stage of cognitive, emotional, and social development, and music education plays a unique role in fostering students' creativity, emotional regulation, and social interaction (Campayo-Muñoz & Cabedo-Mas, 2017). Systematic music learning can not only enhance students' artistic performance abilities but also promote the development of their emotional expression and sense of cooperation, thus achieving the cultivation of comprehensive quality (McPherson, Davidson, & Faulkner, 2012).

With the continuous deepening of educational reform in China, the status of music education has gradually risen, especially after the implementation of the "Double Reduction" policy, which has significantly increased the emphasis on art education in the school curriculum. However, in reality, high school music education still faces many challenges, such as limited curriculum resources, insufficient teacher professional development, and a single teaching evaluation system. These problems have led to the underutilization of music education's potential to promote students' comprehensive development. Some studies have pointed out that innovative teaching methods, such as the integration of information technology with music education, can significantly enhance students' musical creativity and learning interest (Zhang, 2022).

From a socio-cultural perspective, the core of music education lies not only in skill transmission but also in nurturing students' creative thinking and emotional expression abilities. The process of music learning helps students establish self-identity, enhance aesthetic experience, and promote

emotional understanding and social empathy (Qi, 2023). Therefore, exploring the developmental characteristics of high school students' musical ability is of great significance for understanding the educational value of music learning and optimizing teaching practices.

This study aims to analyze the changing characteristics of high school students' musical ability and explore the impact of socio-cultural backgrounds, educational policies, and teaching methods on its development. By combining theoretical and empirical analysis, the study seeks to provide scientific evidence for high school music curriculum design, teacher training, and educational policy optimization, promoting the transformation of music education from a skills-oriented to a comprehensive quality-oriented approach (Li, 2023; Zheng, 2025).

2. Definition and Development of Musical Ability

2.1 Definition of Musical Ability

Musical ability refers to the various capabilities exhibited by individuals in the field of music, including perceptual skills such as pitch recognition, rhythmic perception, and harmony identification, as well as abilities in music composition, performance, and understanding. Scholars generally agree that musical ability is influenced not only by innate genetic factors but also by significant training and environmental factors (Schellenberg, 2001). The composition of musical ability is complex, encompassing multiple dimensions such as perception, cognition, and emotion. Research has shown that musical ability intersects significantly with other cognitive functions, such as language, memory, and attention (Thompson & Salig, 2025). For example, studies have indicated that individuals with higher musical ability perform better in foreign language learning, demonstrating stronger pitch discrimination and more accurate pronunciation (Milovanov & Tervaniemi, 2011). Additionally, musical ability is also linked to skills in non-musical domains such as

emotional expression and social interaction (Schellenberg, 2023). Therefore, musical ability is considered a comprehensive cognitive and emotional capability that involves a wide range of psychological and physiological mechanisms and plays an important role across various domains.

2.2 Development of Musical Ability

The development of musical ability is a complex and gradual process, ranging from the early music perception abilities in infancy to high-level musical performance in adulthood. This process is closely related to the development of cognitive, emotional, and social skills. Research shows that foundational abilities for music perception and performance, such as rhythm perception and pitch recognition, begin to develop in infancy. Infants' responses to music indicate that they possess music perception abilities similar to adults, although cultural factors influence their musical habits (Trehub, 2023). As individuals grow older, musical skills are not only influenced by genetic tendencies but also by the profound impact of the external environment and educational training. Systematic music education, in particular, is considered crucial for the development of musical ability, although research indicates that the long-term effects of music education on non-musical cognitive abilities (such as language and mathematics) are still inconclusive (Schellenberg, 2001; Schellenberg & Lima, 2023). Moreover, studies have pointed out that the enhancement of musical ability goes beyond technical training and includes emotional expression, creativity, and social skills development, which suggests that music training has a broad impact on the overall improvement of an individual's qualities (Mustafayev, 2020). Therefore, the development of musical ability involves not only the accumulation of cognitive skills but also the enhancement of emotional regulation, social interaction, and self-efficacy.

3. Developmental Characteristics of Musical Ability in High School Students

Erikson (1968) pointed out that the high school stage is a critical period for individuals to establish their identity, making music learning an important means for adolescents to express themselves and construct their identities. It is also a key period for adolescent socialization and personality development (Călin et al., 2021; Nadaf, 2019). During this stage, music serves not only as a form of emotional expression but also as a vital pathway for fostering self-identity and enhancing personality (Deniz, 2010; Yağısan & Koca, 2011).

The development of musical ability in high school students exhibits multidimensional characteristics, including the deepening of perceptual aesthetics, the refinement of skill construction (Oliynyk & Umrykhina, 2023), and the strengthening of interaction with social and cultural contexts (Rebrova, 2025). At this stage, students' musical ability demonstrates distinct developmental features: auditory discrimination and emotional understanding are enhanced, and musical performance places greater emphasis on individuality and emotional expression (Tierney et al., 2015). Some students participate in composition and arrangement, reflecting a shift from imitation to creation (Rosevear, 2004). Moreover, musical participation supports the development of

emotional expression and social skills, thereby fostering psychological growth and social adaptation (Aydin, 2019). Thus, the development of musical ability during this period reflects the dynamic interaction between arts education and identity formation.

3.1 Musical Perception and Aesthetics

High school students' musical perception and aesthetic ability develop significantly during adolescence. Between the ages of 11 and 20, skills such as sense of rhythm, pitch recognition, and harmonic perception gradually differentiate, and continuous participation in musical activities can enhance melodic perception and auditory discrimination (Gooding & Standley, 2011). At this stage, students' musical ability shifts from emotional experience to rational understanding (Gembris, 2006), with gradual improvement in aesthetic judgment and imagination (Chen, 2008).

Gender and sociocultural factors also exert significant influence: female students tend to prefer lyrical and delicate styles, while male students are more inclined toward rhythmic and intense types. Musical preferences also become more stable under the influence of peer culture and popular trends (North et al., 2001).

Overall, the development of musical ability among high school students is characterized by increasingly refined perception, rationalized aesthetics, and strengthened cultural identity.

3.2 Musical Cognition and Skills

Music learning can significantly enhance high school students' spatial intelligence, creative thinking, and cooperative ability (Chen et al., 2022). However, some students still show weaknesses in fundamental skills such as sight-singing and auditory discrimination, particularly in the transformation from notation to sound, where auditory training needs to be strengthened (Chen, 2008). The development of musical ability during adolescence is closely related to physiological maturation and cognitive advancement (Gembris, 2006). Continuous participation in musical activities can improve auditory discrimination and melodic perception (Gooding & Standley, 2011).

Early skill levels are more predictive of musical engagement than the frequency of participation (Müllensiefen, Elvers, & Frieler, 2022), and trained individuals show advantages in executive functioning. Physical development also leads to stage-based differences, such as vocal fluctuation during voice mutation in boys and gradual vocal changes in girls.

In summary, music learning and skill development among high school students are characterized by cognitive enhancement, differentiated ability, and physiological staging.

3.3 Sociocultural and Educational Environment

Sociocultural and educational environments play a significant role in the development of high school students' musical ability. With the deepening of aesthetic education concepts

and the implementation of the “Double Reduction” policy, the status of music education has improved, and students have more opportunities for participation (Chen et al., 2022). Research shows that theories of musical development have shifted from stage-based general models to an emphasis on domain specificity and sociocultural embeddedness (Hargreaves & Zimmerman, 1992; Runfola & Swanwick, 2002).

The theory of “musical identity” suggests that biological predispositions, cognitive resources, and sociocultural contexts interact during adolescence to jointly shape musical ability and self-identity (Hargreaves, Miell, & MacDonald, 2002). Meanwhile, music also plays an important role in emotional regulation and group identity, reflecting characteristics of cultural embeddedness and social development (Hargreaves, Marshall, & North, 2003).

The development of musical ability during the high school stage is characterized by cognitive maturity, emotional deepening, and sociocultural integration. Students’ musical experiences are shifting from emotional to rational, and differences in ability are gradually becoming apparent.

Given the significant developmental changes and high plasticity at this stage, it is particularly crucial to establish a scientific diagnostic tool to accurately capture the growth trajectory of students’ musical ability and provide a basis for educational intervention.

4. Current Status of Musical Ability Development among Chinese High School Students

The General High School Music Curriculum Standards (China Ministry of Education, 2020) propose that music education should develop students’ abilities in aesthetics, perception and performance, creation, and cultural understanding. However, there remains a gap between curricular goals and actual outcomes in teaching practice. To understand the current state of students’ musical ability development and provide a foundation for tool development, this study conducts an analysis from four aspects: perception, performance, creation, and cultural understanding.

In terms of musical perception and basic skills, students generally demonstrate weak overall ability. Li (2006) found that high school students commonly exhibit a state of “strong interest but weak ability.” Chen (2019), in a survey of 2,035 students in Kunming, reported low levels of sight-singing, music reading, and pitch recognition, with significant differences across gender, class type, and school category. Shan (2012) pointed out that a loosely structured curriculum and insufficient implementation of the standards were the main contributing factors. Feng (2020) further noted that only 15% of students in municipal schools met music reading standards, while the rate was just 6% in county-level schools, reflecting inadequate resource allocation and curricular support.

In terms of musical performance ability, most students are able to complete imitation and singing tasks but show deficiencies in understanding musical works and expressing

emotions. Luo (2018) pointed out that students often exhibit a phenomenon of “understanding what they hear” but being “unable to articulate or perform it.” Liu (2022), in a survey of 316 students, found that limited class hours and monotonous content in appreciation courses led to significant differences in students’ style judgment and emotional perception, reflecting the absence of personalized cultivation and evaluation mechanisms.

In terms of creative and expressive ability, this dimension—recognized as a higher-order skill—has long been marginalized. Li (2018) pointed out that although students show strong interest in composition and arrangement, their ability development is hindered by the lack of instructional design and assessment systems. Current teaching still places emphasis on technical training while overlooking creativity and individual expression.

In terms of cultural understanding and aesthetic ability, teaching often remains at the knowledge level due to the abstract nature of the objectives, insufficient resources, and outdated teacher perceptions. Liu (2022) pointed out that the marginal status of the curriculum in the college entrance examination has led teachers to prioritize knowledge transmission while neglecting aesthetic cultivation. Li (2018) argued that the lack of formative assessment and differentiated standards has made it difficult to effectively implement students’ aesthetic experiences and cultural understanding.

In terms of teacher ability to identify and provide feedback, Yuan (2020) pointed out that insufficient understanding of the curriculum standards has led to a disconnect between instructional goals and implementation strategies. Liu (2022) noted that the exclusion of music from the college entrance examination has reduced teachers’ motivation for research and improvement, and evaluation often relies on personal experience. Li (2018) further indicated that teachers commonly adopt uniform standards, neglecting student differences, which undermines the precision of instruction and the effectiveness of feedback.

Existing research generally indicates that the overall level of musical ability development among Chinese high school students is relatively low, showing various forms of imbalance and insufficiency.

First, students demonstrate limited musical perception ability and uneven skill development, reflecting weaknesses in curriculum structure and resource allocation (Wu, 2006; Chen, 2019; Shan, 2012; Feng, 2020). Second, students lack depth in musical performance ability and emotional understanding; although they can imitate and sing, they often struggle with deeper artistic expression (Luo, 2018; Liu, 2020). Third, creative expression has long been marginalized, as composition activities are restricted by the absence of effective instructional and assessment systems (Li, 2018). Fourth, the implementation of aesthetic and cultural understanding goals remains weak, with classroom instruction continuing to emphasize knowledge transmission over aesthetic experience (Liu, 2020; Li, 2018).

Finally, teachers often have limited understanding of

curriculum standards and lack effective feedback mechanisms, leading to a disconnect between instructional objectives and classroom implementation (Yuan, 2020; Liu, 2022; Li, 2017).

5. Factors Affecting Musical Ability Development in High School Students

5.1 Influence of Socio-Cultural Background

In the development of musical ability in high school students, socio-cultural background plays a crucial role. Research indicates that factors such as gender and cultural background significantly affect students' music preferences and abilities. According to a study by Lorenzo et al. (2020) on music preferences among Brazilian high school students, girls generally prefer emotionally rich and gentle music styles, while boys tend to favor music with strong rhythms (Lorenzo et al., 2020). This gender difference not only reflects the socio-cultural construction of gender roles but also reveals the socialization process of music preferences. Furthermore, socio-cultural background has a significant impact on students' choices and development in music education. For instance, families with a higher cultural background are more likely to encourage their children to choose and participate in music courses, and this cultural advantage contributes to the development of children's musical abilities (Carioti et al., 2019). This trend reflects the role of cultural capital in educational choices and suggests that the influence of culture and peer groups is a key factor in the development of high school students' musical ability.

5.2 Educational Policies and the Music Education Environment

Educational policies have a profound impact on the development of musical ability in high school students, particularly in areas such as resource allocation and teacher training. In recent years, China's "Double Reduction" policy has had a significant impact on the music education environment. This policy aims to reduce students' extracurricular burdens and promote quality education, which has indirectly elevated the status of music education. Research shows that this policy not only helps alleviate students' academic pressure but also promotes increased resource investment and teacher training in music education at schools (Huo, 2023).

Furthermore, reforms in music education have also driven the development of music publishing, facilitating the sharing of educational resources and more equitable educational opportunities (Yin, 2022). This series of policy changes has laid the foundation for the long-term development of music education and has led to broader recognition of the value of music education in the holistic development of students.

5.3 Influence of Teachers and Curriculum Design

Teachers play a crucial role in music education, especially in fostering students' creativity and emotional expression. Research indicates that teachers' teaching methods, emotional intelligence, and classroom assessment standards directly influence the development of students' musical abilities (Sharofiddinovich, 2025). Music education not only

emphasizes students' technical abilities but also focuses on emotional expression and the development of creative thinking. By employing innovative teaching models, such as designing creative music activities and adopting interdisciplinary teaching approaches, teachers can better stimulate students' creative potential (Wu, YOSHIOKA, & WEN, 2024). For instance, studies show that teaching methods emphasizing creativity and practice can significantly enhance students' musical structure and optimization abilities, particularly in improvisation and music composition (Sharofiddinovich, 2025). Additionally, curriculum design plays a decisive role, especially when the curriculum is tailored to students' actual needs and provides training in creativity and emotional expression. This leads to significant improvements in students' overall artistic level and emotional cognition (Yang & Arifani, 2025). Therefore, teachers should integrate both technical skills and emotional expression in their teaching to cultivate students' comprehensive musical abilities.

6. Discussion

This study explores the stage-specific characteristics and constraints of high school students' musical ability, focusing on the connotation, developmental features, and influencing factors of musical ability. The results indicate that high school is a critical period for the rapid development of students' musical ability, with music learning exhibiting multi-dimensional interactions in perception, cognition, and emotion. However, current high school music education still faces issues such as a narrow curriculum structure, insufficient creative training, and lagging teacher professional development.

From a socio-cultural perspective, gender and family cultural capital significantly influence students' music preferences and learning opportunities. Girls tend to favor lyrical music, while boys prefer rhythm-driven genres, reflecting the socialization process of gender roles. At the same time, students from families with abundant cultural resources have a distinct advantage in the development of their musical abilities, indicating that cultural capital remains an important factor influencing music learning.

At the level of educational policy, the "Double Reduction" policy has provided new opportunities for the development of music education by promoting resource investment and the emphasis on art curricula. However, the effects of this policy have yet to be fully implemented in teaching practice, as the curriculum still focuses heavily on knowledge and skill training, lacking innovation and personalized guidance, which has led to insufficient development in students' creativity and expressive abilities.

Teachers and curriculum design play a decisive role in enhancing students' musical ability. Currently, most teaching remains at the level of imitation and skill-building, neglecting the cultivation of emotional experience and creative thinking. Limitations in teachers' understanding of the curriculum, differentiated teaching, and feedback assessment make it difficult for music education to achieve a transformation toward a comprehensive quality-oriented approach.

Overall, the development of musical ability among Chinese high school students shows a characteristic of “strong interest, weak ability.” While students have a high willingness to learn, their ability development is constrained by teaching content, evaluation systems, and resource allocation, leaving limited room for improvement. To promote high-quality music education, a scientific music ability diagnostic system should be established, teacher training and curriculum innovation should be strengthened, and music education should achieve a comprehensive enhancement in the areas of aesthetics, creativity, and cultural understanding.

7. Conclusion

This study systematically analyzes the developmental characteristics and influencing factors of high school students' musical ability, revealing the contradictions and challenges in China's high school music education in terms of policy promotion and teaching practice. The results indicate that the high school years are a crucial period for the formation and enhancement of musical ability, with students demonstrating multidimensional development in areas such as perceptual aesthetics, skill cognition, emotional expression, and cultural understanding. However, current music education remains primarily focused on skill training, with a narrow curriculum structure and insufficient emphasis on creativity and emotional development, limiting the overall improvement of students' musical literacy.

Socio-cultural background, educational policies, and teachers' teaching methods are significant factors influencing high school students' musical ability. While the “Double Reduction” policy has raised the social status of music education, its effects have not yet fully translated into classroom results. Gender differences and family cultural capital still create significant disparities in students' music learning, while teachers' professional competence and teaching innovation capabilities directly determine the depth and quality of music education.

In the future, a scientific music ability diagnostic and evaluation system should be established, teacher training mechanisms should be improved, curriculum design should be optimized, and a focus on creativity and cultural understanding should be strengthened. This will help facilitate the transformation of high school music education from skill development to comprehensive quality enhancement. This not only supports the holistic development of students' musical abilities but also provides practical pathways and theoretical foundations for the quality-based reform of China's basic education.

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