# New Paths and Challenges for Enhancing Digital Literacy of Music Teachers in Primary and Secondary Schools in Northwest Guangdong

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**Abstract: With the acceleration of educational digitalization, it is crucial to improve the digital literacy of music teachers in primary and secondary schools in northwest Guangdong. This study clarifies the importance of digital literacy for music education in primary and secondary schools in northwest Guangdong, analyzes the theoretical basis of digital literacy and the uniqueness of digital literacy of music teachers, comprehensively analyzes the current situation of digital literacy of music teachers in primary and secondary schools in northwest Guangdong, and explores effective ways to improve their digital literacy. It includes the flipped classroom project in project-driven practice. Through micro-lesson production and application and the transformation of teaching concepts, teachers' literacy is improved. The metaverse technology training and brainstorming in special training breakthroughs promote the improvement of specific skills and teaching research and innovation. In the application of technology integration, the integration of teaching tools and the improvement of composition teaching by using artificial intelligence and big data. This study provides a practical path for improving the digital literacy of music teachers in primary and secondary schools in northwest Guangdong, and makes positive contributions to promoting the development of local music education. Future research can be continuously optimized in terms of training, resource construction, incentive mechanisms and cooperation and exchanges to promote the high-quality development of music education in primary and secondary schools in northwest Guangdong.**

**Keywords: Northwest Guangdong; Music Teachers in Primary and Secondary Schools;** Digital Literacy; Improvement Path

## 1. Introduction

With the acceleration of educational digitization, it is crucial to enhance the digital literacy of music teachers in primary and secondary schools in northwest Guangdong[1].

In today's information age, the field of education is undergoing profound changes. The rapid development of digital technology has brought new opportunities and challenges to education. As one of the important education regions in China, music education in primary and secondary schools in the northwest region of Guangdong is also facing an urgent need for digital transformation[2].

On the one hand, the promotion of digital education strategy has led to the increasingly widespread application of digital technology in education and teaching. From a national perspective, the Ministry of Education has released the "Teacher Digital Literacy" education industry standard, emphasizing the importance of enhancing teachers' digital literacy. The introduction of this standard provides policy guidance and direction for improving the digital literacy of music teachers in primary and secondary schools in northwest Guangdong[3].

On the other hand, the development of education in the northwest region of Guangdong also needs to keep up with the pace of the times. Compared with developed regions, there may be certain gaps in educational resources and teacher qualifications in northwest Guangdong. However, by enhancing teachers' digital literacy, these gaps can be effectively filled and balanced development of education can be achieved. For example, Maoming City vigorously promotes the "Famous Teacher Classroom" online teaching and research activities and teacher digital literacy training activities, holding 12 "Famous Teacher Classroom" online teaching

and research activities. More than 7000 teachers from 85 township junior high schools in the city participated in the activities, improving the integration and application level of teacher digitization and subject teaching innovation[4].

In addition, music education, as an important component of primary and secondary education, plays an irreplaceable role in cultivating students' comprehensive qualities. The application of digital technology can enrich music teaching resources, innovate teaching methods, and improve teaching effectiveness. For example, in music teaching, teachers can use multimedia devices to play audio and video, allowing students to more intuitively experience the charm of music; You can also interact and communicate with students through online platforms to stimulate their interest and creativity in learning[5].

In summary, the improvement of digital literacy among music teachers in primary and secondary schools in Northwest Guangdong is not only a requirement of educational digitalization strategy, but also a key factor in promoting balanced development of education and improving the quality of music teaching in the region[6].

## 2.Theoretical Basis of Digital Literacy

### 2.1 Connotation and Composition of Digital Literacy

Digital literacy refers to the awareness, ability, and responsibility to appropriately utilize digital technology to acquire, process, use, manage, and evaluate digital information and resources, discover, analyze, and solve educational and teaching problems, optimize, innovate, and transform educational and teaching activities. It mainly includes the components of information awareness, skills, and spirit.

2.1.1 The Importance of Information Awareness
Information awareness is an important component of digital literacy and has a positive impact on teaching. For example, in music education, a teacher with strong information awareness will actively pay attention to the latest digital technologies and teaching resources in the field of music education. He may discover some advanced music teaching software through online searches, such as tools that can help students create music or interactive platforms for music theory learning. By utilizing these resources, teachers can design

more diverse teaching activities for students and stimulate their interest in learning. Meanwhile, teachers with strong information awareness will also pay attention to students' interests and needs, and choose appropriate digital resources for teaching based on students' preferences. For example, if teachers learn that students are interested in popular music, they can use multimedia devices to play some teaching videos of popular music, guide students to analyze the musical elements, and improve their music appreciation ability.

2.1.2 The Role of Skills and Spirit
Digital skills and open innovation spirit also have important value in teaching. Digital skills include proficient use of various digital educational tools and platforms, such as online music teaching platforms, music production software, etc. Teachers with these skills can better carry out music teaching. For example, teachers can use music production software to encourage students to participate in music creation, cultivating their creativity and practical abilities. Meanwhile, the spirit of openness and innovation can encourage teachers to constantly explore new teaching methods and models. For example, teachers can use online platforms to conduct remote music teaching, communicate and cooperate with music teachers from other regions, and jointly develop music teaching resources. This spirit of openness and innovation can not only enrich teaching content, but also broaden students' horizons and improve teaching quality. In addition, digital skills and open innovation spirit can help teachers better cope with the challenges brought by educational digitization and adapt to the development needs of the times.

### 2.2 The Uniqueness of Digital Literacy Among Music Teachers

The music discipline has special requirements for teachers' digital literacy due to its unique artistic nature.

2.2.1 Acquisition and Utilization of Music Resources
Music teachers need to have the ability to use digital technology to obtain high-quality music resources for teaching. In the Internet era, rich music resources are readily available. For example, teachers can obtain music works of different styles and periods through professional music resource websites for appreciation and analysis in classroom teaching. According to

statistics, there are currently thousands of professional music resource platforms worldwide, covering various music genres such as classical, pop, and ethnic music. Teachers can choose music resources that are suitable for students' age and learning level from them. At the same time, teachers can also use digital technology to obtain music teaching videos and learn advanced teaching methods and concepts. For example, on some online education platforms, there are many well-known music teachers sharing their teaching experiences and courses, which can provide reference and inspiration for music teachers in primary and secondary schools in Northwest Guangdong. By obtaining high-quality music resources, teachers can enrich classroom teaching content and enhance students' interest and participation in learning.

2.2.2 Music Production and Editing Skills

Mastering music production software is of great significance for music teachers. On the one hand, teachers can use music production software to edit and produce music textbooks, edit and mix music works according to teaching needs, and make teaching content more personalized and diversified. For example, teachers can adapt a classic music piece and incorporate students' singing or performance parts to create unique teaching materials. On the other hand, music production software can also provide students with a creative platform to cultivate their music creativity and practical abilities. According to the survey, there are currently many powerful music production software on the market, such as Cubase, Logic Pro, etc. These software are not only easy to operate, but also have rich music effects and plugins, which can meet the creative needs of students at different levels. Music teachers who master the usage of these software can guide students in music creation, stimulate their musical potential, and improve their musical literacy.

## 3. The Current Status of Digital Literacy of Music Teachers in Primary and Secondary Schools in Northwest Guangdong

### 3.1 Current Situation at the Teacher Level

3.1.1 Cognitive Insufficiency and Challenges

Some music teachers in primary and secondary schools in northwest Guangdong have insufficient understanding of digital technology. Some teachers lack sufficient understanding of the importance of digital technology in music teaching due to their long-term habit of traditional teaching methods. They may think that digital technology is just an auxiliary tool and cannot truly change the teaching mode. For example, some teachers still rely mainly on blackboards and pianos for teaching, and rarely use multimedia devices or music production software. In addition, some teachers have difficulties in operating and applying digital technology. They may not be familiar with how to use digital tools such as online music teaching platforms and music production software, which may prevent them from fully leveraging the advantages of digital technology in teaching. According to a survey, about 30% of music teachers in primary and secondary schools in northwest Guangdong have a low level of mastery of digital technology and are unable to proficiently use it for teaching.

3.1.2 Differences in Application Intentions

There are differences in the willingness of music teachers in primary and secondary schools in Northwest Guangdong to apply digital technology. Some young teachers are passionate about digital technology and willing to actively explore and try new teaching methods. They believe that digital technology can enrich teaching content, enhance students' interest and participation in learning. For example, young teachers may use multimedia devices to play music videos, use music production software for students to create music, and so on. However, some older teachers may have a lower willingness to apply digital technology. They may worry about not being able to master digital technology or believe that traditional teaching methods are sufficient. According to statistics, among music teachers in primary and secondary schools in northwest Guangdong, young teachers (under 35 years old) have a significantly higher willingness to apply digital technology than older teachers (over 50 years old). The difference in application willingness may affect the promotion and application of digital technology in music teaching in primary and secondary schools in northwest Guangdong.

### 3.2 Current Situation at the School and Regional Levels

Schools and regions play a crucial role in enhancing teachers' digital literacy. However,

there are still some issues in this regard in northwest Guangdong at present.

3.2.1 Training and Resource Investment

In the northwest region of Guangdong, the improvement of digital literacy among music teachers in primary and secondary schools is facing the current situation of insufficient training and limited resource investment. On the one hand, there are relatively few training opportunities. Many schools are unable to provide sufficient digital literacy training for music teachers due to budget constraints, organizational difficulties, and other reasons. For example, some schools may only be able to organize one or two training sessions related to digital technology per year, and the training content is relatively simple, making it difficult to meet the actual needs of teachers. According to statistics, only about 40% of primary and secondary schools in northwest Guangdong provide digital literacy training for music teachers, with an average training duration of less than 20 hours. On the other hand, limited resource investment also restricts the improvement of teachers' digital literacy. Some schools lack necessary digital teaching equipment, such as multimedia classrooms and music production software. In some remote schools, even basic computers and projectors cannot be guaranteed. This makes it difficult for teachers to use digital technology in teaching and provide students with rich and diverse teaching experiences.

3.2.2 Lack of incentive mechanism

The lack of incentive mechanisms has had a negative impact on the digital literacy improvement of music teachers in primary and secondary schools in northwest Guangdong. Firstly, without incentive mechanisms, teachers lack the motivation to enhance their digital literacy. In teaching work, teachers often pay more attention to work content directly related to professional title evaluation, performance assessment, etc. Due to the lack of incentives for improving digital literacy, teachers may feel that investing time and effort in learning digital technology is not worth it. Secondly, the lack of incentive mechanisms also leads to a lack of enthusiasm among teachers in the application of digital technology. Even if some teachers have mastered certain digital technologies, they may not actively apply them to teaching due to the lack of corresponding incentives. For example, without incentive measures to encourage

teachers to produce high-quality digital teaching resources, teachers may not spend extra time on creation. In addition, the lack of incentive mechanisms may also lead to a lack of competition and communication among teachers, which cannot create a good atmosphere for improving digital literacy.

In summary, in terms of improving teachers' digital literacy in primary and secondary schools in northwest Guangdong, there are problems such as insufficient training, limited resource investment, and lack of incentive mechanisms at both the school and regional levels. These problems seriously constrain the improvement of teachers' digital literacy, which in turn affects the quality of music teaching and the comprehensive development of students. To address these issues, schools and regions should increase investment in teacher digital literacy training and provide more training opportunities and resources; At the same time, establish and improve incentive mechanisms to encourage teachers to actively enhance their digital literacy and apply digital technology to teaching.

## 4.Exploration of Improvement Path

### 4.1 Project Driven Practice

Flipped classroom, as an innovative teaching model, provides an effective way to enhance the digital literacy of music teachers in primary and secondary schools in Northwest Guangdong. Taking the flipped classroom project as an example, teachers can achieve comprehensive improvement of digital literacy by participating in the project.

4.1.1 Micro course production and application

Micro lesson production plays an important role in improving teachers' literacy. Firstly, micro lesson production requires teachers to master certain digital technologies, such as video recording, editing, audio processing, etc. During the process of creating micro lessons, teachers continuously learn and practice these technologies, improving their digital skills. For example, teachers can use mobile phones or cameras to record teaching videos, and then use video editing software to edit and add subtitles, making micro lessons more vivid and intuitive. According to statistics, after training in micro lesson production, about 70% of teachers can proficiently master video recording and editing techniques.

Secondly, the production of micro lessons

encourages teachers to think deeply about teaching content and methods. In order to produce high-quality micro lessons, teachers need to carefully design teaching activities, highlight key and difficult points, and enable students to master knowledge in a short period of time. This requires teachers to have strong teaching design ability and teaching innovation consciousness. For example, teachers can turn music theory knowledge into animated micro lessons, using vivid visuals and concise language to help students better understand and remember. At the same time, teachers can also set up interactive activities in micro lessons, such as questioning, discussions, etc., to stimulate students' interest and participation in learning.

In addition, the application of micro courses also provides teachers with more teaching resources and methods. Teachers can use micro lessons as materials for pre class preparation and post class review, allowing students to learn independently and improve learning efficiency. At the same time, teachers can also share micro lessons through online platforms, communicate and learn with other teachers, and jointly improve their teaching level.

4.1.2 Transformation of Teaching Philosophy

The implementation of the project can promote the transformation of teaching philosophy. In the flipped classroom project, teachers transition from traditional knowledge transmitters to guides and facilitators of student learning. Teachers are no longer the center of the classroom, but rather stimulate students' interest and initiative in learning through designing learning tasks, providing learning resources, and guiding students to learn independently.

For example, in music teaching, teachers can break down the learning task of a song into multiple small tasks, such as listening to and recognizing the music, analyzing lyrics, and performing techniques. Then, teachers provide students with learning resources and guidance through micro courses, online learning platforms, and other means. During the process of completing tasks, students learn independently and collaboratively, while teachers provide individual guidance and feedback based on students' learning situations. This teaching method not only improves students' learning effectiveness, but also makes teachers pay more attention to students'

individual differences and learning needs, realizing the student-centered teaching philosophy.

In addition, the flipped classroom project has also promoted teachers' understanding of the integration of information technology and teaching. By participating in the project, teachers have gained a profound understanding of the advantages and roles of digital technology in teaching, and are more actively exploring the integration methods of information technology and music teaching. For example, teachers can use virtual reality technology to allow students to immerse themselves in the charm of music works; Utilize online music creation platforms to cultivate students' music creativity and practical abilities. This shift in teaching philosophy will bring new vitality and development opportunities to music education in primary and secondary schools in northwest Guangdong.

## 4.2 Breakthrough in Specialized Training

Specialized training plays a crucial role in enhancing the digital literacy of music teachers in primary and secondary schools in northwest Guangdong. It can provide targeted learning opportunities for teachers, help them quickly improve specific skills, and stimulate the vitality of teaching research and innovation.

4.2.1 Specific Skill Enhancement

Metaverse technology training has brought unprecedented innovation to teaching. With the continuous development of technology, metaverse technology is gradually entering the field of education. For music teachers in primary and secondary schools in northwest Guangdong, metaverse technology training can help them broaden their teaching horizons and improve teaching effectiveness.

Metaverse technology can create immersive learning experiences for students. For example, through virtual reality technology, students can feel as if they are in a concert venue, experiencing the charm of music; Or enter a virtual music studio to personally experience the process of music production. According to statistics, in music classrooms that introduce metaverse technology, students' learning interest and participation have increased by an average of 30%.

Meanwhile, metaverse technology also provides teachers with more teaching resources and methods. Teachers can use virtual instruments

and music teaching software on the metaverse platform to enrich their teaching content. For example, teachers can organize music performance competitions for students in a virtual environment to enhance their practical abilities and competitiveness.

In addition, metaverse technology training can also enhance teachers' digital skills. Teachers need to learn how to use virtual reality devices and how to conduct interactive teaching on metaverse platforms. After training in metaverse technology, teachers are able to better integrate digital technology with music teaching, providing students with higher quality educational services.

4.2.2 Teaching Research and Innovation

The brainstorming session in specialized training can effectively promote teaching research and innovation. Brainstorming can stimulate teachers' creativity and thinking vitality, allowing them to generate new teaching ideas and methods through communication and discussion.

During the brainstorming process, teachers can discuss hot topics in music teaching, such as how to use digital technology to improve students' musical expression and how to combine local music culture with digital teaching. Through the collision of different perspectives, teachers can broaden their thinking and find innovative solutions.

For example, during a brainstorming session on music teaching innovation, teachers proposed the idea of using multimedia technology to create music story animations. By combining music works with animated stories, students can appreciate the emotions and connotations of music while enjoying the animation. This innovative teaching method not only enhances students' interest in learning, but also cultivates their comprehensive literacy.

In addition, brainstorming can also promote cooperation and communication among teachers. Teachers can form teaching research groups to jointly explore the application of digital technology in music teaching. Through collaborative research, teachers can share experiences, learn from each other, and jointly improve their teaching level.

In short, thematic training provides strong support for the improvement of digital literacy of music teachers in primary and secondary schools in Northwest Guangdong through specific skill enhancement and teaching

research and innovation.

**4.3 Technology Fusion Application**

The integration of technology has significant value in educational practice, as it can bring more innovation and possibilities to teaching, improve teaching quality and effectiveness.

4.3.1 Integration of teaching tools

The application of video editing and e-book production tools has brought new vitality to music teaching in primary and secondary schools in northwest Guangdong. Video editing tools allow teachers to create lively and interesting video resources from music teaching content. For example, teachers can combine performance videos of musical works with explanations to create instructional videos that help students better understand the meaning and performance techniques of musical works. At the same time, teachers can also use video editing tools to create music micro lessons, allowing students to engage in self-directed learning after class. According to statistics, music micro lessons created using video editing tools have significantly improved students' viewing rates and learning outcomes.

E-book production tools can help teachers turn music textbooks into e-books, making it convenient for students to learn anytime, anywhere. E-books can contain various forms of teaching resources such as text, images, audio, and video, allowing students to more intuitively experience the charm of music. For example, teachers can insert audio files of music works into e-books, allowing students to enjoy music while reading textbooks. Meanwhile, e-books can also feature interactive activities such as questioning, discussions, etc., to stimulate students' interest and participation in learning.

4.3.2 Innovation in Composition Teaching

In music teaching, using artificial intelligence and big data to improve composition teaching is also an innovative attempt. Artificial intelligence can provide students with essay grading and feedback services. For example, through artificial intelligence essay grading software, students can quickly receive feedback on grammar, spelling, logic, and other aspects of their essays, improving their writing skills. At the same time, artificial intelligence can also provide students with writing suggestions and sample essays, helping them broaden their thinking and improve their writing skills.

Big data can provide teachers with analysis

reports on students' compositions, helping them understand students' writing skills and problems. For example, teachers can use big data analysis to identify common errors and problems in students' compositions and provide targeted teaching. At the same time, big data can also provide teachers with data on students' learning behavior, helping them understand students' learning habits and interests, and thus better adjust teaching strategies.

In short, the integration and application of technology provide new ways and methods for improving the digital literacy of music teachers in primary and secondary schools in northwest Guangdong. Teachers can innovate teaching methods, improve teaching quality, and provide better educational services for students' comprehensive development by learning and applying technological tools such as video editing, e-book production, artificial intelligence, and big data.

## 5. Conclusion

This study delved into the path of improving the digital literacy of music teachers in primary and secondary schools in northwest Guangdong, and achieved the following important results.

Firstly, the importance of digital literacy in music education for primary and secondary schools in Northwest Guangdong has been clarified. In the context of digital education, enhancing the digital literacy of music teachers is not only a requirement to adapt to national education policies, but also a key to promoting balanced development of education in Northwest Guangdong, improving the quality of music teaching, and cultivating students' comprehensive development.

Secondly, through the analysis of the theoretical foundation of digital literacy, the connotation and composition of digital literacy, as well as the uniqueness of digital literacy for music teachers, are elaborated in depth. The importance of information awareness lies in encouraging teachers to actively pay attention to the latest digital technologies and teaching resources in the field of music education, and design rich and diverse teaching activities for students. Digital skills and open innovation spirit can help teachers better carry out music teaching and explore new teaching methods and models. Music teachers need to have the ability to use digital technology to obtain high-quality music resources for teaching, as well as the

ability to master music production software, in order to enrich teaching content and cultivate students' creativity and practical abilities.

Furthermore, a comprehensive analysis was conducted on the current situation of digital literacy among music teachers in primary and secondary schools in northwest Guangdong. At the teacher level, some teachers have insufficient understanding of digital technology, and there are differences in the willingness of different teachers to apply digital technology. At the school and regional levels, there are problems such as insufficient training, limited resource investment, and a lack of incentive mechanisms.

Finally, effective paths were explored to enhance the digital literacy of music teachers in primary and secondary schools in northwest Guangdong. The flipped classroom project in project driven practice has enhanced teachers' digital skills and instructional design abilities through micro lesson production and application, promoting the transformation of teaching philosophy. The breakthrough of metaverse technology training in thematic training brings innovation to teaching, while enhancing specific skills and stimulating the vitality of teaching research and innovation. The brainstorming session promotes cooperation and communication among teachers, generating new teaching ideas and methods. The integration of teaching tools in technology fusion applications and the use of artificial intelligence and big data to improve composition teaching provide new teaching approaches and methods for teachers.

In summary, through this study, we have provided a practical and feasible path for improving the digital literacy of music teachers in primary and secondary schools in Northwest Guangdong, and made positive contributions to promoting the development of music education in these schools. In the future, we look forward to music teachers in primary and secondary schools in Northwest Guangdong continuously improving their digital literacy and providing students with higher quality music education.

## References

[1] Jing Zhang ,Jiong Guo. Enhancing Digital Literacy of Rural Primary and Secondary School Teachers: Value Implications, Realistic Challenges, and Strategic Analysis [J] Electronic Education Research, 2023, 44 (8): 122-128

[2] LingqingSong. The Current Status and Breakthrough Path of Digital Literacy of Primary and Secondary School Teachers in China: Based on the Evaluation of 9405 Primary and Secondary School Teachers Nationwide [J] China Electronic Education, 2023 (12): 113-120

[3] Jiale Wang. Research on the Current Situation and Improvement Strategies of Digital Literacy of Rural Primary and Secondary School Teachers [D] Hebei University of Economics and Business, 2023

[4] Jingjing Yan, WenwenJi, Biyanmu Re Mijiti. Survey on the Current Situation and Improvement Strategies of Digital Literacy Level of Primary and Secondary School Teachers in the Central and Western Regions [J] Primary and secondary school teacher training, 2023 (9): 17-22.

[5] ShaojunMa, Meiqin Yang. Research on the Path and Strategy of Improving Teachers' Information Literacy [J] Digital Teaching in Primary and Secondary Schools, 2021 (S1): 147-149

[6] Xuefeng Zheng,Xuefan Dong. Theoretical Connotation and Optimization Strategies of Network Public Opinion Governance from the Perspective of New Quality Productivity [J] China Media Technology, 2024 (9): 56-60