Case study

Knowledge and Ability Needs of Music Teachers in Primary and Secondary Schools: A Survey of Graduates from a Normal University in Gui Zhou, China

ABSTRACT

The teaching quality of primary and secondary schools is closely related to the level of teachers' knowledge and abilities. Besides, the level of teachers' knowledge and abilities is directly related to the quality of teachers' pre-service education. In this research, 177 teachers who work in primary and secondary schools and graduated from a music major at a normal university in Guizhou from 2016 to 2020 were surveyed by random sampling to identify the current knowledge and abilities need of primary and secondary music teachers. Apart from that, Excel and SPSS software were used for the statistical analysis of questionnaire data. As shown by the results, the music teachers in primary and secondary schools have a solid grasp of the laws and regulations related to education, knowledge, and subject-professional knowledge, but their abilities of subject-professional skills and comprehensive abilities need to be improved, especially the abilities of music creation, choreography, small band rehearsal, and information technology application and scientific research abilities. It is hoped that this research could provide enlightenment and references for the reform and development of music teachers' pre-service education in primary and secondary schools in China.

Key words: *Abilities; Knowledge; Music teacher; Primary and secondary schools; Pre-service education;*

INTRODUCTION

Music education, as an important part of aesthetic education in primary and secondary education, plays an irreplaceable role in the implementation of quality education in schools. As is well known, the main goal of pre-service music education is to train qualified music teachers in primary and secondary schools. The cultivation of

competences in pre-service music education is largely dependent on the setting of music courses (Liu Hongyan, 2016). Music education in primary and secondary schools is aimed to cultivate students' aesthetic abilities and high quality (Meng Fanhong, 2007). However, the disconnection between pre-service music teachers' education in universities and music education in primary and secondary schools leads to the incompetency of pre-service music teachers in music teaching (Xie Jingru, 2014), and seriously affects the improvement of students' aesthetic abilities in primary and secondary schools. Thus, how to effectively combine music education in primary and secondary schools with pre-service music education is a common concern in the development of pre-service music education.

Firstly, this research compiled a questionnaire regarding the knowledge and abilities of music teachers in primary and secondary schools. Secondly, a questionnaire survey was conducted among the graduate music majors of a Normal College in Guizhou who graduated in recent five years from 2016 to 2020 and taught in primary and secondary schools. Finally, a descriptive analysis of the collected data was made to understand the specific situation of the knowledge and abilities of music teachers in primary and secondary schools. In short, this research will not only offer specific data for the curriculum setting of pre-service education of music teachers but also provide enlightenment and references for the reform and development of pre-service education of music teachers in China. It is hoped that this research can play a positive role in promoting the perfection and development of the pre-service education system of music teachers in China, and improve the quality of music teaching quality in primary and secondary schools in China.

LITERATURE REVIEW

Although there are no achievements of knowledge and abilities of music teachers in primary and secondary schools, there are still many kinds of research related to this topic, which is roughly as follows:

For one thing, the knowledge and abilities of music teachers in primary and secondary schools in China are researched. Peng Xiaoqin (2021) conducted a questionnaire survey, in-depth interviews, and on-site tests on the

playing and singing abilities of 12 music teachers from 3 secondary schools in Changsha, Hunan Province, and found that “at present, the combination of impromptu accompaniment and playing and singing remains a difficult problem for music teachers in primary and secondary schools”. Besides, Zhou Linhua (2021) investigated the status quo and improvement of the abilities and quality of music teachers in primary and secondary schools. It was found that music teachers in primary and secondary schools have "backward educational concepts", “obsolete professional knowledge”, as well as "backward teaching methods", and "the leading role of teachers is not fully played". Furthermore, Tong He and Yin Aiqing (2018) analyzed the status quo and countermeasures of pre-service primary and secondary schools music teachers’ practical teaching abilities. Then, they claimed that primary and secondary schools music teachers "ignore the integration of music teaching skills in teaching state" and "lack understanding of Chinese works in teaching content", and the "teaching design and teaching objectives are inconsistent with the teaching process". Based on questionnaires and network interviews, Zhang Lulu (2020) claimed that the rate of the basic information-based teaching hardware of music teachers in primary and secondary schools is high, and 86% of teachers can collect music videos and watch excellent open classes through Internet, but teachers are still lacking in explanation and presentation as well as classroom information interaction. Xie Qiujing (2011) mentioned that some teachers are in a fuzzy state in understanding the nature of the new curriculum standard, values, and the concept of consciousness, their comprehensive knowledge structure is narrow, and they do not have solid professional knowledge and lack the modern teaching practice abilities.

For another thing, the abilities and quality of music teachers in primary and secondary schools are researched internationally. As revealed by findings, teachers feel less confident in teaching certain components specifically in areas of composition, music appreciation, and improvisation and experimentation (Liau, 2018). Moreover, teachers are inadequately trained to cope with the demands of employing creative music-making methods in the classroom. (Liau Swee Foong, 2014). It was confirmed that the teaching competency or lack of expertise to teach music among

primary school teachers is one of the main problems in music teaching (Jamaludin, 2012). Meanwhile, Wong, Pan & Shah (2016) found that teachers' inadequate preparation and resources and insufficient content knowledge of multicultural music lead to the limited implementation of multicultural music education in the music classroom. As stated by Chan & Jamaludin (2010), the lack of expertise is one of the main problems in music teaching.

In conclusion, there is abundant research on the knowledge and abilities of music teachers in primary and secondary, including the investigation on the status quo of playing and singing, the application of computer technology, the abilities, and quality of teachers, the practical teaching abilities of music teachers as well as the status quo of teachers on the new curriculum standards in China. At the same time, there is an international survey on the musical abilities and literacy of primary and secondary music teachers. It can be seen that the research on the present situation of primary and secondary music teachers' knowledge and abilities is very rich. However, the issue regarding the disconnection between the pre-service curriculum and the teaching practice of primary and secondary music teachers has not been explored thoroughly. In most of these studies, qualitative research methods and literature analysis are used to put forward some ideas, but there is a lack of data support and analysis. This research aims to use the quantitative research method to compile a set of "questionnaires on the knowledge and abilities of music teachers in primary and secondary schools", and conduct a questionnaire survey on the students who have graduated from a normal college in music major and are working in primary and secondary schools in Guizhou to identify the current knowledge and abilities need of primary and secondary music teachers.

RESEARCH OBJECTIVE

Based on the issues discussed above, the main purpose of this research is to investigate the current knowledge and abilities needs of music teachers in primary and secondary schools in China, so as to provide a reference for the reconstruction of music teachers' pre-service curriculum in China. Therefore, this research proposes the following specific research objectives:

(1) To identify the overall situation of knowledge and abilities of music teachers in primary and secondary schools;

(2) To identify the advantages and disadvantages of the educational and professional knowledge of music teachers in primary and secondary schools;

(3) To identify the advantages and disadvantages of the professional abilities of music teachers in primary and secondary schools;

(4) To identify the advantages and disadvantages of the teaching abilities of music teachers in primary and secondary schools;

(5) To identify the advantages and disadvantages of the comprehensive abilities of music teachers in primary and secondary schools.

RESEARCH QUESTIONS

(1) What is the overall situation of the knowledge and abilities of music teachers in primary and secondary schools?

(2) What are the advantages and disadvantages of the education and professional knowledge of music teachers in primary and secondary schools?

(3) What are the advantages and disadvantages of the professional abilities of music teachers in primary and secondary schools?

(4) What are the advantages and disadvantages of the teaching abilities of music teachers in primary and secondary schools?

(5) What are the advantages and disadvantages of the comprehensive abilities of music teachers in primary and secondary schools?

METHODOLOGY

Place of investigation and object of the research

This research was conducted in Guizhou, China. The research objects were the students who graduated from a normal university in Guizhou from 2016 to 2020. They have obtained the corresponding teaching certificate and have been working as music teachers in primary and secondary schools for 1-5 years. They must have studied full-time for at least four years and typically completed about 160 credits before graduation.

Research tools

This study used statistical analysis software including Excel and SPSS (Statistical Product and Service Solutions) for data statistics, analysis, and processing. At present, Excel and SPSS are the most popular data processing software. They have a clear interface, perfect calculation function, perfect chart tools, and powerful features, which could greatly facilitate research.

Design of questionnaire

This research is based on the classification of teachers' knowledge and the classification of specific abilities required by music teachers according to the general standard of teacher certification graduation requirements. At the same time, the literature research results including *the teacher professional literacy Structure Mind Map* and *Chinese Student Development Core literacy Research Group Questionnaire*, as well as the needs of music teachers' professional development and professional characteristics were combined to design the questionnaire. After repeated consideration, the specific dimensions and variables of the questionnaire were finally designed.

The questionnaire is divided into two parts. The first part is the basic information, including gender, graduation time, teaching grade, and teaching area. The second part is the investigation of knowledge and abilities, which is classified into four dimensions: education and subject knowledge, specialized abilities, teaching abilities, and comprehensive

abilities. In order to make the questionnaire authentic and reliable, the questionnaire was filled in anonymously. To comply with the standardization of the survey, a pilot testing was conducted before the questionnaire was officially distributed. The main purpose of the pilot testing is to screen variables through the survey and test the reliability and validity of measurement tools.

Pilot testing

After the preparation of the pilot test the graduates who majored in music from a normal university in Guizhou and worked in primary and secondary schools were selected as the objects of pilot testing. In this pilot test, 29 questionnaires were randomly distributed and collected. After the questionnaire was collected, the researchers tested the reliability and validity of the questionnaire scale. The test results of the scale were basically qualified after analysis.

Formal questionnaire project design

After the pilot testing, the formal questionnaire of this research was formed, with 31 items in total. The questionnaire consists of two parts and takes about 10 minutes to answer. The first part is the basic information about teachers, including gender, graduation time, teaching grade, and teaching area. The second part is a questionnaire on the current situation of music teachers' abilities in primary and secondary schools, with 27 items in total, which includes four dimensions: education subject knowledge, specialized abilities, teaching abilities, and comprehensive abilities. Among them, 7 items are education and subject knowledge, 9 items are professional abilities, 5 items are teaching abilities, and 6 items are comprehensive abilities. To be specific, the items contained in each dimension are shown in Table 1. The questionnaire was divided into five scales of "bad", "not good", "average", "good" and "excellent", with scores of 1, 2, 3, 4, and 5, respectively. The main reason for choosing the Likert scale is that it has the advantages of easy design, a wide range of applications, higher reliability, and convenient labeling.

Table 1. Knowledge and Abilities of Music Teachers in Primary and Secondary schools

Education subject knowledge	1. Do you understand the education laws and regulations?
	2. Do you know "the four principles of good teachers"?
	3. Do you know the duties of a teacher?
	4. Do you know the standard knowledge of the music course you teach?
	5. How is your theoretical knowledge of music technology?
	6. How is your basic knowledge of music theory?
	7. How is your artistic knowledge in addition to music?
Specialized abilities	1. How are your abilities in vocal singing?
	2. How well do you play the piano?
	3. How are your abilities to play and sing yourself?
	4. How are your abilities to play instrumental music in addition to piano?
	5. How is your chorus conducting and rehearsal abilities?
	6. How are your abilities to rehearse in a small band?
	7. How are your abilities in campus choreography?
	8. How are your abilities to read music and hear sounds?
	9. How are your abilities to compose music?
Teaching abilities	1. How are your music teaching design abilities?
	2. How are your music teaching abilities?
	3. How are your traditional music development skills?
	4. How are your abilities to reflect on teaching?
	5. How are your class management abilities?
Comprehensive abilities	1. How are your abilities to plan and organize music activities?
	2. How are your comprehensive education abilities?
	3. How are your research abilities?
	4. How are your communication skills?
	5. How are your writing skills?
	6. How are your abilities to use modern information technology?

RESEARCH RESULTS

Participants

The questionnaire data of this research were collected through "Questionnaire Star Based on the WeChat Platform". A total of 177 questionnaires were issued and recovered in the formal investigation, with a recovery rate of 100%. Besides, 177 questionnaires were effective and the effective rate was 100%. This questionnaire survey was conducted on 177 graduates who graduated in music majors from a normal university in Guizhou from 2016 to 2020

and worked in primary and secondary schools, including 42 males and 135 females. In addition, 45 teachers graduated in 2016, 32 teachers in 2017, 39 teachers in 2018, 27 teachers in 2019, and 34 teachers in 2020. As shown by the survey results, 81 graduates are teaching in urban schools and 96 graduates are teaching in rural schools. Meanwhile, 113 graduates teach in primary schools, 45 graduates in junior schools, and 19 graduates in senior high schools (see table 2 for details).

Table 2.

Participants			
Variable	Category	Number	Percentage
Gender	Male	42	23.73
	Female	135	76.27
Year of graduation	2016	45	25.42
	2017	32	18.08
	2018	39	22.03
	2019	27	15.25
	2020	34	19.21
Location	Urban	81	45.76
	Village	96	54.24
Grade	Primary	113	63.84
	Junior	45	25.42
	Senior	19	10.73

Reliability analysis

Reliability analysis is to measure the internal consistency of the test data according to the formula and then serves as the reliability index. Cronbach's Alpha, also known as Alpha reliability, was proposed by the American psychologist Lee J. Cronbach (1916-2001) in 1951. Generally speaking, the larger the value, the higher the internal consistency, and the more reliable, the results. It is generally believed that the larger α coefficient value has the higher reliability and accuracy of the measurement. When α> 0.9, it indicates high reliability. When α is between 0.8-0.9, it reveals good reliability. When α is between 0.7 and 0.8, it indicates that the reliability is acceptable. When α is between

0.6-0.7, it reveals that the reliability needs to be studied. When α is between 0.5-0.6, it indicates low reliability. When α is lower than 0.35, it can be abandoned. In this research, the reliability was analyzed and calculated by SPSS statistical software, and the results are as follows: Table 3 is the overall results of this research, and Table 4 is the reliability results of four dimensions.

Table 3 Overall results of the research

Overall reliability		
Cronbach's Alpha	Cronbach's Alpha based on standardized terms	Items
.962	.962	27

Table 4 reliability results of four dimensions

Four dimensions			
Dimensions	Cronbach's Alpha	Cronbach's Alpha based on standardized terms	Items
Education subject knowledge	.810	.806	7
Specialized abilities	.932	.933	9
Teaching abilities	.873	.874	5
Comprehensive abilities	.897	.912	6

As shown in Table.3, Cronbach's Alpha in the overall reliability test result is 0.962, and Cronbach's Alpha based on the standardized item is 0.962. The coefficients are all greater than 0.9, indicating high overall reliability. As shown in Table.4, Cronbach's Alpha based on standardized terms of the four dimensions is all greater than 0.8, indicating that the reliability of the four dimensions is good. To conclude, the design of the four dimensions of the items is completely reliable in statistics, and the data of the questionnaire can be further analyzed.

Validity analysis

Exploratory factor analysis was used to analyze the validity of this research. Validity analysis is an analysis of the scale as a whole. KMO sphericity test is usually performed on the data to verify validity. Generally speaking, when KMO is greater than 0.9, it indicates that it is extremely suitable for factor analysis. When KMO is between 0.8 and 0.9, it indicates that it is very suitable for factor analysis. When KMO is between 0.7 and 0.8, it means that it is suitable for factor analysis. When KMO is between 0.6 and 0.7, it indicates that it is barely suitable for factor analysis. When KMO is between 0.5 and 0.6, it indicates that it is not suitable for factor analysis. When KMO is less than 0.5, it indicates that factor analysis is not suitable. SPSS test results show that when Sig.<0.05 (p-value <0.05), factor analysis is effective and there is a correlation between variables. If the significance of the Bartley sphericity test is less than 0.05, we can also consider that the questionnaire has good structural validity. The KMO and Bartlett spherical test values of this questionnaire are displayed in Table 5.

Table 5 KMO and Bartlett spherical test values

KMO and Bartlett tests		
KMO sampling suitabilities quantity.		.945
Bartlett sphericity test	The approximate chi-square	3906.980
	Degree of freedom	351
	Significance	.000

As shown in table 5, the value of KMO sampling appropriateness is .945, and the Bartlett spherical test is about 3906.980 chi-square. Common factors are the majority, and the significance is 0, which is less than 0.05 and reaches the significant level. This indicates that the questionnaire has good structural validity.

To conclude, the overall dimensions of the items have passed the significance level test of Cronbach's coefficient test, KMO test, and Bartlett sphericity test, indicating that the questionnaire has high reliability and validity and is highly persuasive in the investigation of the knowledge and abilities of primary and secondary music teachers.

Data analysis and description

Descriptive analysis was used to analyze and describe the minimum, maximum, average, standard deviation, and variance of each topic. To more clearly and intuitively understand the status quo of the knowledge and abilities of music teachers in primary and secondary, the research was carried out from the overall dimensions and four dimensions.

Table 6. Results of descriptive statistics

Descriptive Statistics							
	Variable	Cases	Min	Max	Average	SD	Variance
Education Subject Knowledge	Do you understand the education laws and regulations?	177	1	5	4.08	.838	.703
	Do you know the duties of a teacher?	177	3	5	4.62	.563	.317
	Do you know "The four principles of good teachers"?	177	1	5	4.56	.729	.531
	How is your theoretical knowledge of music technology?	177	1	5	3.64	.991	.982
	Do you know the standard knowledge of the music course you teach?	177	1	5	3.99	.908	.824
	How is your basic knowledge of music theory?	177	1	5	3.51	.960	.922
	How is your artistic knowledge in addition to music?	177	1	5	3.38	.952	.907
				Mean	3.97		
Specialized Abilities	How are your abilities in vocal singing?	177	1	5	3.63	.850	.722
	How well do you play the piano?	177	1	5	3.30	.974	.950
	How are your abilities to play and sing at the same time?	177	1	5	3.31	.941	.886
	How are your abilities to play instrumental music in addition to piano?	177	1	5	3.40	.979	.957
	How is your chorus conducting and rehearsal abilities?	177	1	5	3.44	.934	.872
	How are your abilities to rehearse in a small band?	177	1	5	3.01	1.095	1.199
	How are your abilities in campus choreography?	177	1	5	3.03	1.092	1.192
	How are your abilities to read music and hear sounds?	177	1	5	3.84	.886	.786
	How are your abilities to compose music?	177	1	5	3.25	1.009	1.017
				Mean	3.36		
Teaching Abilities	How is your music teaching design abilities?	177	1	5	3.76	.826	.682
	How are your music teaching abilities?	177	1	5	3.79	.837	.700

	How are your traditional music development skills?	177	1	5	3.44	.946	.896
	How are your abilities to reflect on teaching?	177	2	5	4.02	.863	.744
	How are your class management abilities?	177	1	5	4.12	.857	.734
				Mean	3.83		
Comprehensive Abilities	How are your research abilities?	177	1	5	3.42	1.282	1.643
	How are your communication skills?	177	2	5	4.08	.818	.669
	How are your writing skills?	177	1	5	3.85	.901	.812
	How are your abilities to use modern information technology?	177	1	5	3.77	.882	.778
	How are your comprehensive education abilities?	177	2	5	3.99	.808	.653
	How are your abilities to plan and organize music activities?	177	2	5	3.89	.845	.714
				Mean	3.83		

As displayed in Table 6, the mean scores of education subject knowledge, specialized abilities, teaching abilities, and comprehensive abilities are 3.97, 3.36, 3.83, and 3.83 respectively. Education subject knowledge scores highest, while specialized abilities score lowest. It can be seen that the primary and secondary music teachers have a solid grasp of education-related laws and regulations, knowledge and subject professional knowledge, but a weak grasp of specialized skills. Among the 27 questions, “understanding the duties of teachers”, “know the four principles of good teachers” and "reflective abilities" score the highest, respectively (4.62, 4.56, and 4.12), which fully proves that music teachers in primary and secondary schools are very clear about the responsibilities of teachers, and have the strong reflective abilities. The lowest scores are 3.25 for music creation, 3.03 for dance rehearsal, and 3.01 for small band rehearsal. It can be seen that the abilities of music teachers in primary and secondary schools in these three aspects need to be improved and strengthened.

Table 7.

Descriptive Statistics of Education and Subject Knowledge

Variable	Cases	Min	Max	Average	SD	Variance
Do you understand the duties of a teacher?	177	3	5	4.62	.563	.317
Do you know the "four principles of good teachers"?	177	1	5	4.56	.729	.531

Do you understand the education laws and regulations?	177	1	5	4.08	.838	.703
Do you understand the standards of the music course you teach?	177	1	5	3.99	.908	.824
How is your theoretical knowledge of music technology?	177	1	5	3.64	.991	.982
How is your ideological theory knowledge of music?	177	1	5	3.51	.960	.922
How is your other artistic knowledge in addition to music?	177	1	5	3.38	.952	.907

As shown in Table 7, the highest scores for "understanding the duties of a teacher", “knowing the four principles of good teachers” and "understanding education laws and regulations" are 4.62, 4.56, and 4.08, respectively. The lowest scores are 3.64, 3.51, and 3.38 for music technology theory, ideological theory knowledge of music, and understanding of other arts, respectively. Obviously, primary and secondary music teachers have a solid grasp of education-related laws and regulations and knowledge, but their understanding of music technology, ideological theory, and artistic knowledge in addition to music is not as good as that of education-related laws and regulations knowledge.

Table 8.

Specialized Abilities Description Statistics

Variable	Cases	Min	Max	Average	SD	Variance
How are your abilities to read music and hear sounds?	177	1	5	3.84	.886	.786
How are your abilities in vocal singing?	177	1	5	3.63	.850	.722
How is your chorus conducting and rehearsal abilities?	177	1	5	3.44	.934	.872
How are your abilities to play instrumental music in addition to piano?	177	1	5	3.40	.979	.957
How are your abilities to play and sing at the same time?	177	1	5	3.31	.941	.886
How well do you play the piano?	177	1	5	3.30	.974	.950
How are your abilities to compose music?	177	1	5	3.25	1.009	1.017
How are your abilities in campus choreography?	177	1	5	3.03	1.092	1.192
How are your abilities to rehearse in a small band?	177	1	5	3.01	1.095	1.199

As shown in Table 8, the highest scores for "reading music and listening abilities", “vocal singing abilities” and "chorus conducting and rehearsal abilities" are 3.84, 3.63, and 3.44, respectively. The lowest scores are 3.25, 3.03, and 3.01 for music creation, school choreography, and small band rehearsal, respectively. It can be seen that music teachers in primary and secondary have strong abilities in "reading music and listening abilities", “vocal music singing” and "chorus conducting rehearsal", while their abilities in "music creation", “campus dance choreography” and "small band rehearsal" should be strengthened.

Table 9.

Teaching Abilities Descriptive Statistics

Variable	Cases	Min	Max	Average	SD	Variance
How are your abilities to reflect on teaching?	177	1	5	4.12	.857	.734
How are your class management abilities?	177	2	5	4.02	.863	.744
How are your music teaching abilities?	177	1	5	3.79	.837	.700
How is your music teaching design abilities?	177	1	5	3.76	.826	.682
How are your traditional music development skills?	177	1	5	3.44	.946	.896

As displayed in Table 9, “reflective abilities” and "management abilities" scores are the highest, which are 4.12 and 4.02 respectively. “Music teaching design abilities” and "traditional music development abilities" score the lowest with 3.76 and 3.44, respectively. It can be seen that primary and secondary music teachers have the strongest abilities in "reflection" and "class management", and their abilities in "music teaching design" and "traditional music development" need to be strengthened.

Table 10.

Comprehensive Abilities Description Statistics

Variable	Cases	Min	Max	Average	SD	Variance
How are your communication skills?	177	2	5	4.08	.818	.669
How are your comprehensive education abilities?	177	2	5	3.99	.808	.653
How are your abilities to plan and organize music activities?	177	2	5	3.89	.845	.714
How are your writing skills?	177	1	5	3.85	.901	.812
How are your abilities to use modern information technology?	177	1	5	3.77	.882	.778
How are your research abilities?	177	1	5	3.42	1.282	1.643

As shown in Table 10, “communication abilities” and "comprehensive education abilities" score the highest, which are 4.08 and 3.99 respectively. “Modern information technology application abilities” and "scientific research abilities" score the lowest, with 3.77 and 3.42 respectively. Most music teachers in primary and secondary have good

"communication abilities" and "comprehensive education abilities", but their "modern information technology application abilities" and "scientific research abilities" still need to be improved.

To sum up, primary and secondary music teachers have a solid grasp of education-related laws and regulations, knowledge, and disciplinary professional knowledge, but their disciplinary professional skills need to be strengthened. Most music teachers are very clear about their responsibilities and have a strong reflective ability. Meanwhile, they have strong music reading and listening abilities, vocal singing abilities, and chorus conducting and rehearsal abilities. Their teaching reflection abilities and class student management abilities are also good. At the same time, they have strong communication skills with students and parents as well as comprehensive classroom management abilities. However, there are still some areas that need to be improved, such as music creation abilities, dance rehearsal abilities, and small band rehearsal abilities. The theory of music technology and ideological theory knowledge of music as well as other artistic understanding is still not enough. Beyond that, their modern information technology application abilities and scientific research abilities should be improved.

DISCUSSION AND SUGGESTION

Discussion

Firstly, the results of the research found that primary and secondary music teachers have a solid grasp of the laws and regulations as well as subject specialized knowledge related to education, and most music teachers gain a very clear understanding of the duties of teachers. However, Zhou Linhua (2021), in his research on the *Status Quo and Improvement of the Abilities and Quality of Music Teachers in Primary and Secondary Schools*, found that music teachers in primary and secondary schools have "backward educational concepts", “obsolete professional knowledge” and "backward teaching methods", and "the leading role of teachers is not fully played".

Secondly, this research found that the application abilities of modern information technology of primary and secondary music teachers need to be improved, which is consistent with the research conclusion of Zhang Lulu

(2020) that music teachers in primary and middle are not capable of grasping modern education teaching practice in terms of explanation and presentation as well as classroom information interaction and communication. In addition, this research also found that small and medium-sized music teachers in music technology, ideological theory, and artistic knowledge except for music are relatively poor. Similarly, Xie Qiujing (2011) pointed out that some teachers are in a fuzzy state in understanding the nature of the new curriculum standard. Additionally, there are some conclusions that the comprehensive knowledge structure is narrow and the professional knowledge foundation is not solid. This research is basically consistent with the result found in Wong, Pan & Shah's research (2016) that the reasons for the limited implementation of multicultural music education in music classrooms are insufficient preparation and resources of teachers, as well as insufficient knowledge of the content of multicultural music.

Finally, this research found that the primary and secondary music teachers' musical composition abilities are not high, which is consistent with the conclusion of Liau (2018) that improvisation and experimentation score the lowest in the syllabus. It is also consistent with the conclusion of Liau Swee Foong (2014) that teachers do not receive adequate training to cope with the requirements of using creative music production methods in the classroom. It can be seen that the music creation abilities of music teachers in primary and secondary schools are a common problem in international music education in primary and secondary schools.

Suggestion

Based on the above conclusions as well as the researcher's teaching practice in colleges and universities, the following three suggestions are put forward for the reform of pre-service education in primary and secondary schools:

First of all, it is essential to strengthening the teaching of professional skills, especially the abilities of music creation, dance rehearsal, and small band rehearsal. Among the 27 questions in the questionnaire, the scores for music creation, dance rehearsal, and small band rehearsal are the lowest, which are 3.25, 3.03, and 3.01 respectively. It

fully proves that the abilities of music teachers in primary and secondary schools need to be improved in these three aspects. The researchers suggest that two steps can be taken to improve these three skills. On the one hand, band rehearsal courses can be opened, and music creation and dancing courses can be added to the pre-service education of music teachers in primary and secondary schools. According to the researchers, most of the pre-service education courses of music teachers in primary and secondary schools offer "songwriting" and "dance" courses, but few of them set "band rehearsal" courses. Meanwhile, music teachers in primary and secondary schools are the worst in these three aspects. Pre-service education may consider increasing the number of class hours for "songwriting" and "body dance" and offering "small band rehearsal" courses when setting up pre-service music education courses. On the other hand, the pre-service education of music teachers in primary and secondary should be reformed. The main teaching object of primary and secondary music teachers is primary and secondary students. Besides, their music creation, dancing, and rehearsal abilities requests are not high. Thus, teachers in pre-service education only need to teach some simple and practical abilities and do not need to cultivate composing, dancing, and conducting skills.

Secondly, it is essential to strengthening the teaching of the theoretical basis of music technology and music thought as well as other artistic knowledge. The lowest scores are 3.64, 3.51, and 3.38 in music technology theory, music thought theory, and other arts, respectively. Obviously, the primary and secondary music teachers' music technology theory, ideological theory knowledge, and artistic knowledge except for music need to be improved. In this regard, the researchers think that it is important to start with the pre-service education classroom reform, music technology, and ideological theory. Indeed, most students are not interested in the theory course, and they spend more time on skill practice but less on the theory. Therefore, teachers of pre-service education should stimulate students' interest in learning and make them spend more time on music theory-related courses.

Finally, it is important to strengthen the application of modern information technology and scientific research abilities of music teachers in primary and secondary schools. The scores for modern information technology

application and scientific research abilities are 3.77 and 3.42, which are the two lowest in the comprehensive abilities. Obviously, the modern information technology application abilities and scientific research abilities of music teachers in primary and secondary schools need to be improved. Furthermore, pre-service education can consider increasing the number of class hours of modern information technology application courses, and strengthen the connection between theory and practice, so that the technology theory learned in class can be applied in teaching practice. Currently, scientific research ability is a weakness for most of primary and secondary music teachers. According to the researchers, some pre-service education curriculum has changed the "graduation dissertation" to "graduation design". That is to say, the previous "graduation dissertation writing" is changed into "concert performance report". The change of form reduces much workload for teachers and students, so that students have more time to practice specialized skills. At the same time, it also affects the improvement of scientific research writing abilities of music teachers in primary and secondary schools. Therefore, it is of great necessity to restore "graduation dissertation writing" in the pre-service curriculum of music teachers in primary and secondary schools.

CONCLUSION

This research found that music teachers in primary and secondary schools have a solid grasp of laws, knowledge, and subject-specialized knowledge related to education, but need to strengthen their mastery of subject-specialized skills. In addition, most music teachers not only have a very clear understanding of the duties of teachers, but also have strong abilities in music reading and listening, vocal singing, and chorus conducting and rehearsals. Teaching reflection abilities and class management abilities are also good. At the same time, they have strong communication skills with students and parents as well as comprehensive classroom education abilities. However, there are still some areas that need to be improved, such as music creation abilities, dance rehearsal abilities, and small band rehearsal abilities. Besides, the ideological theory knowledge of music and music technology theory as well as other

artistic knowledge needs to be strengthened. Modern information technology application abilities and scientific research abilities also need to be improved. Based on the research results, the researchers have put forward some suggestions. It is hoped that this research can provide specific data for the reference of the curriculum setting of pre-service education of music teachers in primary and secondary schools, and offer enlightenment for the reform and development of pre-service education of music teachers in primary and secondary schools in China. The researchers also hope that this research can positively promote the perfection and development of the music education system in normal universities, and drive the improvement of the quality of music teachers in primary and secondary schools in China.

However, this research also has some shortcomings. First, the sample source is relatively single source, and the sample collection is limited to 177 music teachers in primary and secondary schools who graduated from a normal university in Guizhou. Second, the research method is relatively simple. This research only adopts the 5-point Likert scale questionnaire survey, without in-depth communication and interviews with music teachers in primary and secondary schools. It is hoped that future research can make up for this deficiency.

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