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RESEARCH ARTICLE

Evaluating the Quality of Training Programs for Pre-Service Music Teachers in Chinese Higher Education Institutions

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ABSTRACT

This research utilized an explanatory sequential design within a mixed-methods framework to assess the effectiveness of three pre-service music teacher programs aimed at Grades 1-12 in China. First, a group of four evaluators was asked to holistically assess the overall quality of these programs on a scale ranging from 1 to 10. Second, the evaluators were invited answer four open-ended questions about the areas for improvement in terms of program goals and objectives, program curricula, instructional methods, and learning assessments, respectively. The generalizability (G-) theory framework was employed to analyze the quantitative data, particularly to examine the variability in ratings and the reliability of the program evaluations. The qualitative data underwent coding, categorization, and organization according to recurring themes. The results indicated that the rating of the quality of these programs by the four program evaluators was extremely consistent and unbelievably reliable. Furthermore, major areas for improvement are identified in program objectives and curricula as well as instructional methods and learning assessments. Implications for pre-service music teacher training program developers in Chinese colleges and universities are discussed.

Contribution/Originality: This study is one of the few studies which used mixed-methods to assess the quality of three pre-service music teacher programs for Grades 1-12 schools in China. It highlighted the need for continuous improvement in these programs to ensure that they effectively prepare future music teachers in diverse educational contexts.

1. Introduction

During the past couple of decades, music education in Chinese Grades 1-12 schools has received increasingly attention (Cao, 2000; Ministry of Education [MoE], 2001, 2011; Wang et al., 2012; Xie & Leung, 2011; Yu & Leung, 2019; Zhu & Su, 2018). The published

2011 music Curriculum Standards (MoE, 2011) advocates that music education should be integrated with other disciplines of learning in Grades 1-12 schools.

Increasing attention is being paid by researchers to the training of music teachers for Grades 1-12 in China (Du, 2019; Li, 2017; Tong & Yin, 2018; Xiao, 2018; Yu & Leung, 2019; Wang et al., 2012; Zhu & Su, 2018). On the one hand, researchers have begun to explore the challenges encountered by pre-service music teachers in Chinese Grades 1-12 schools (e.g., Huang, 2012b; Li, 2017; Tong & Yin, 2018); on the other hand, they have become interested in providing the universities which offer the pre-service music teacher training programs with suggestions for improvement so that their graduates can become qualified music teachers in Grades 1-12 schools (e.g., Dong, 2015; Du, 2019; Li, 2017; Tong & Yin, 2018; Xu, 2016).

Since these universities are responsible for training Grades 1-12 schools' music teachers, the quality of their training programs merits further investigation. Therefore, this study sought to assess the quality of pre-service music teacher education programs for Grades 1-12 at three universities in China.

1.1. Research Objective

The study's objective was to evaluate the quality of three music teacher training programs in Chinese higher education through both quantitative analysis (using G-theory) and qualitative analysis (using open-ended data).

1.2. Research Questions

This study was guided by three primary research questions: a) how does the quality of the three music teacher training programs vary according to ratings? b) How reliable are these ratings, particularly in terms of generalizability coefficients for norm-referenced score interpretations? And c) what are the key areas needing improvement in terms of goals, curricula, instructional methods, and assessments?

2. Literature Review

The main objective of university-based pre-service music teacher programs is to prepare future music teachers for Grades 1-12 with the necessary knowledge and skills for effective classroom instruction, and it is evident that the quality of music education in Grades 1-12 is strongly linked to the level of training and preparation these teachers receive at universities (Abril & Gault, 2006; Anderson & Denson, 2015; Ballantyne & Packer, 2004; Ballantyne, 2007; Conway, 2002; Law & Ho, 2009; McNeill & McPhail, 2020; Rauduvaite, 2017; Xiao, 2018; Zhu & Su, 2018). If early music teachers are not adequately prepared for job-related challenges, they may experience "praxis shock", which refers to the discrepancy between music teachers' ideal teaching practice and what it actually is (Ballantyne & Packer, 2004; Ballantyne, 2007). Therefore, the extent to which pre-service music teacher training programs in universities can help pre-service teachers adapt to future working careers is worth exploring (Anderson & Denson, 2015; Ballantyne & Packer, 2004; Ballantyne, 2007; Conway, 2002; Roulston et al., 2005; Xiao, 2018; Yang, 2018).

Chinese pre-service music teacher training programs include specialty education, undergraduate education, and graduate education. As described by Zhu and Su (2018)

and Rauduvaite (2017), the purpose of specialty education is to develop students' professional skills so that they can acquire basic music education skills and become teachers of basic music education; the goal of undergraduate education is to equip students with scientific research abilities in addition to music education activities; and graduate education is aimed at equipping students with a strong ability of scientific research.

Additionally, pre-service music education in China primarily consists of university-based music education, professional training at traditional music conservatories, and normal music education. According to Zhu and Su (2018), university-based pre-service music education is more comprehensive compared to professional music conservatories and normal education, as it aims to develop individuals with advanced performance, teaching, and artistic management capabilities. The primary aim of traditional music conservatories is to cultivate music elites, whereas normal universities focus on training music teachers for Grades 1-12. The strength of the conservatory was in performance and music education, while the strength of the normal universities was in pedagogy and educational psychology. Therefore, universities need to cultivate compound talents in order to enhance competitiveness.

The literature has identified the following four major problems faced by pre-service music teacher training program in Chinese higher education (Xiao, 2018; Yang, 2018). First, the pre-service teachers cannot integrate their performing and teaching skills effectively in the classroom. Performing on the stage and teaching in the classrooms vary substantially. A good music teacher should integrate these two skills effectively in the classroom (Du, 2019; Huang, 2012a; Li, 2017; Tong & Yin, 2018).

Second, the pre-service teachers face challenges in determining the content for music teaching in the classroom (Li, 2017; Tong & Yin, 2018). For example, they often have a limited understanding of Chinese music pieces and struggle to convey the deeper meanings of these works to their students (Li, 2017; Tong & Yin, 2018).

Third, the pre-service teachers demonstrate difficulties in designing their music classes (Dong, 2015; Du, 2019; Huang, 2012a; Li, 2017; Tong & Yin, 2018). For example, the class objectives are not well articulated; the classroom teaching procedures cannot achieve the class objectives (Dong, 2015; Du, 2019, Tong & Yin, 2018).

Finally, the pre-service teachers meet considerable challenges in choosing the effective methods for music teaching in the classroom (Dong, 2015; Du, 2019; Li, 2017; Tong & Yin, 2018; Xu, 2016). For example, they always focus on teaching but ignoring listening to the music (Du, 2019; Tong & Yin, 2018).

The literature has provided the following suggestions for improvement. First, the administrators of the universities which offer the pre-service music teacher training programs should be aware that their students are facing several problems in teaching music to Grades 1-12 school students in the classroom (Dong, 2015; Du, 2019; Huang, 2012a; Li, 2017; Tong & Yin, 2018; Xu, 2016). Awareness of these issues is crucial for enhancing the quality of pre-service music teacher training programs (Li, 2017; Tong & Yin, 2018).

Second, it is important for the universities which offer the pre-service music teacher training programs to set clear goals of their training programs (Du, 2019; Li, 2017; Tong

& Yin, 2018). The administrators and also program developers need to understand that they are training qualified Grades 1-12 school music teachers in the classroom, not the professional musical performers on the stage (Du, 2019; Huang, 2012a; Li, 2017). Therefore, they must keep in mind the national music *Curriculum Standards* (MoE, 2011) while developing their programs and ensure that their program goals align perfectly with the national standards (Du, 2019; Li, 2017; Tong & Yin, 2018).

Third, it is also important for the universities which offer the pre-service music teacher training programs to improve their curricula and course offerings (Li, 2017; Tong & Yin, 2018). In addition to the music courses, they should also include music education courses in their curricula, for example, the teaching pedagogy courses, the music technology courses, and music teaching practicum (Du, 2019; Li, 2017; MoE, 2011). The purpose of these courses is to provide the pre-service teacher candidates with practical skills training in teaching music in Grades 1-12 classrooms.

Finally, it is urgent for the universities which offer the pre-service music teacher training programs to hire in-service Grades 1-12 music teachers to teach the practical courses in the training programs (Dong, 2015; Du, 2019; Li, 2017; Xu, 2016). As argued by Tong and Yin (2018), some universities have only one full-time teacher majoring in music education. Therefore, they should recruit more experienced music teachers for their pre-service music teacher training programs.

To sum up, the literature did identify several problems faced by the pre-service music teacher training program for Grades 1-12 schools. It also offered some suggestions for the improvement of these music teacher training programs. However, very little research has systematically evaluated these programs from the following core components of an academic program such as goals and objectives, program curricula, instructional methods, and learning assessments. In addition, none of the previous studies was conducted within a modern evaluation theoretical framework, i.e., generalizability theory, and from the perspective of experts in music education. This study, therefore, aimed to bridge these gaps.

2.1. Core components of an academic program

It is known that goals and objectives, course curricula, instructional methods, and learning assessments are the core components of an academic program (Brown, 1995). According to Brown (1995), goals are general statements, which state the program's purpose or aim. Objectives are clear statements that specify the knowledge, skills, or behaviors that learners are expected to demonstrate by the end of a course or program (Brown, 1995).

The goals and objectives are used to guide the development of an academic program. They provide the basic units that will be used to define and organize all teaching activities and assignments into a coherent program. The rest of the program will be developed, modeled, and refined based on the established goals and objectives. They will also guide the development of courses, instructional methods, and learning assessments (Brown, 1995).

2.2. Generalizability theory – A modern evaluation theoretical framework

Generalizability (G-) theory (Cronbach, Gleser, Nanda, & Rajaratnam, 1972) is increasingly adopted by professionals involved in evaluation and assessment across educational contexts, particularly in performance assessments and program evaluations (Huang, 2008, 2012; Liu & Huang, 2020; Li & Huang, 2022; Raykov & Marcoulides, 2006; Yin & Shavelson, 2008). It broadens the scope of classical test theory by accounting for multiple sources of variability that can influence evaluation outcomes.

Furthermore, it also serves as a statistical approach for identifying sources of variance and error, and for estimating their impact on the accuracy of scores and ratings (Shavelson & Webb, 1991). This theory offers a robust conceptual and methodological framework for examining multiple facets of measurement simultaneously (Brennan, 2001), making it an ideal theoretical basis for this study.

3. Research Methods

3.1. Methodological considerations

Triangulation of different sources of data was a major consideration in designing this study. A combination of quantitative and qualitative methods was employed to obtain triangulated data for analysis, which ultimately allowed the evaluation of the pre-service music teacher training programs for Grades 1-12 schools in Chinese universities. In addition, the use of triangulated methods and data analyses eventually added validity and generalizability of the findings of this study.

This research utilized a mixed-methods approach with an explanatory sequential design. According to Ivankova et al. (2006), this design is characterized by an initial stage of quantitative data collection and analysis, followed by a stage of qualitative data collection and analysis to explore and explain the quantitative results in more depth.

3.2. The selection of universities and training programs

Pre-service music teacher training programs for Grades 1-12 schools in three universities (i.e., *A*, *B*, and *C*) were purposefully selected for this study. The universities were chosen based on the criterion that a) they must be four-year institutions; b) they must be close in geographical locations; and c) they must have training programs for Grades 1-12 music teachers.

University *A* is situated in Nanning, the capital of Guangxi Zhuang Autonomous Region, and is one of China's eight comprehensive undergraduate institutions specializing in the arts. It recruits students from all over the country and has more than 16000 full-time students and over 1300 faculty and staff. Its School of Music Education was established in 1938. It takes advantage of the rich music and dance resources of ethnic minorities in Guangxi and the convenience of the international cultural exchange. It attaches importance to the comparative study of the excellent music culture of the nation and all nationalities in the world. The school has established long-term relationships with 17 Grades 1-12 schools in the district for students' teaching practice.

The School of Music Education currently has 92 faculty members including nine professors and 30 associate professors. All of its full-time faculty members graduated

from well-known music and art colleges in China and abroad. It has both undergraduate and Master's programs. Its undergraduate program in music education trains music teachers for Grades 1-12 schools.

University *B* is based in Guangzhou, Guangdong Province, and stands as the sole higher education institution dedicated to music in South China, with a student body exceeding 5,000 and a faculty and staff of over 700. Its School of Music Education was established in 1980. It is the first in Guangdong Province to offer the four-year undergraduate music education program. It stresses the importance of practice and student teaching. It has established long-term relationships with many K-12 schools in many cities across the province.

The School of Music Education currently has over 40 faculty members including three professors and 23 associate professors. It has only undergraduate programs. It highlights the characteristics of Lingnan culture and aims at training qualified music teachers for colleges and K-12 schools.

University *C* is located in Wudang District, Guiyang City, Guizhou Province. It was founded in 1978. It has more than 13000 full-time students and over 1100 faculty and staff. The University has established international partnerships with universities in America, Canada, and Thailand. School of Music and Dance was established in 2009. It has established long-term relationships with over 20 schools in the province.

The School of Music and Dance currently has 49 faculty members including two professors and 19 associate professors. Its music education program started in 2011 and aims to train qualified music teachers for Grades 1-12 schools in Guizhou Province.

3.3. The selection of evaluators

The four program evaluators of the study were three males (*E*, *F*, and *G*) and one female (*H*) who were selected through convenience sampling method. All of them have received their graduate degrees in music education. Each evaluator has more than a decade of experience in music teacher education. It is crucial to note that they were fully informed about the study and understood that their participation was entirely voluntary.

3.4. The evaluating instrument

The instrument used in the study was a 10-point overall quality rating form of three music teacher training programs (1 = the poorest quality, 10 = the best quality; half points were allowed) and four open-ended questions (i.e., what are the major areas for improvement in a) goals and objectives, b) program curricula, c) instructional methods, and d) learning assessments).

3.5. The evaluating procedure

The four invited evaluators were provided with the summary sheets of all three music teacher training programs in the areas of goals and objectives, program curricula, instructional methods, and learning assessments. They were then invited to rate the overall quality of each of the three music teacher training programs holistically on a 1–10-point scale. Finally, they were asked to respond to the four open-ended questions.

3.6. Data analyses

The data collected from the four experienced program evaluators were analyzed at two different levels. First, quantitative data were analyzed within the G-theory framework. Specifically, using GENOVA (Crick & Brennan, 1983) the variability and reliability in ratings of the quality of the three music teacher training programs were analyzed, respectively. GENOVA is a G-theory computer program used to estimate the rating variability and reliability.

Second, qualitative data gathered from evaluators' answers to four open-ended questions were coded, categorized, and organized based on recurring themes. To enhance the validity of the qualitative analysis, direct quotes from the evaluators were included (Creswell, 2014).

4. Results

4.1. The variability in ratings of the quality of the three music teacher training programs

The variability in how the four evaluators rated the quality of the three music teacher training programs was assessed using G-theory. The findings are summarized in Table 1.

Table 1: Rating variability of the quality of the three music teacher training programs

Sources of variability	df	σ^2	Standard error	%
p	2	1.22	.91	81.33
r	3	0	.05	.71
pr	6	.28	.14	18.67
Total	11	1.50	1.10	100

As shown in Table 1, the analysis of rating variability for the quality of the three music teacher training programs revealed that the object of measurement, the programs themselves, accounted for the largest variance component (81.33% of the total variance), indicating significant differences in program quality as perceived by the evaluators. The residual variance, which includes the interaction between programs, raters, and other unexplained factors, accounted for 18.67% of the total variance.

However, the rater (*r*) variance component was zero, indicating that the evaluators provided highly consistent ratings for the three music teacher programs.

4.2. The reliability in ratings of the quality of the three music teacher training programs

The reliability in how the four evaluators rated the quality of the three music teacher training programs was assessed using G-theory. The findings are summarized in Table 2.

Table 2: Rating reliability of the quality of the three music teacher training programs

No. of programs (*p*)	No. of raters (*r*)	*G*-coefficients
3	1	.81
3	2	.90
3	3	.93
3	4	.95

As shown in Table 2, the reliability coefficients (i.e., G-coefficient) were .81, .90, .93, and .95 for one, two, three, and four raters, respectively. These results suggested that the quality rating of the three music teacher training programs was extremely consistent and unbelievably reliable.

4.3. Major areas for improvement in goals and objectives

All four evaluators commented that the three schools (i.e., *A*, *B*, and *C*) have clear goals for their programs. For example, School *A* aims to train pre-service music teachers to be culturally and professionally qualified, and practically innovative with entrepreneurship consciousness suitable for music education in Grades 1-12 schools. School *B* aims to train pre-service music teachers to be professional individuals who meet the needs of the development of contemporary music education, possess advanced music education ideas, master modern music education methods, demonstrate basic skills of music teaching and modern educational technology, have systematic professional knowledge of music education and certain music performance skills, and can engage in basic music teaching and basic music education research. School *C* aims to train qualified Grades 1-12 music teachers who master music education theories, are equipped with music education knowledge and practical teaching skills, have a solid foundation in Grades 1-12 music education, and have innovative spirit and certain research abilities.

However, goals are just general statements which state the aim of the program. Objectives are required for each program. Evaluator *E* commented that "*program objectives are very specific statements about the particular knowledge and skills for the students to develop in the program*." Among the three schools, as commented by all four evaluators, Schools *A* and *B* do not state their program objectives.

Unlike Schools *A* and *B*, School *C* states the following seven program objectives: their graduates should a) have a passion for music education; b) abide by professional ethics; c) have good music psychological quality and healthy physique, and pass the test of *Students' Physical Health Standard*; d) have a solid theoretical foundation with music knowledge and proficient music skills in musical hearing and sight singing, music technology and its application, and appreciation of Chinese and foreign music works, as well as art works of art, dance, film and television, and other art categories; e) have adequate skills in vocal singing, piano performance and accompaniment, performing one musical instrument (except piano); music commanding, and guiding rehearsal of chorus and a small band; f) demonstrate good professional quality of teachers, be familiar with educational laws and regulations, be able to undertake music teaching and organize music extracurricular activities and social art activities, have the ability to write music teaching plans in Grades 1-12 schools, and have communication and classroom management skills; and g) master the methods of literature retrieval and data query, and have the ability to use modern information technology for teaching and scientific research.

4.4. Major areas for improvement in program curricula

The courses offered by the three schools (i.e., *A*, *B*, and *C*) are similar. Both required and elective courses are offered by these programs. For example, School *A* offers the following three types of required courses: a) foundation courses including fundamentals and introduction (i.e., *basic music theory*) and knowledge and skills (i.e., *piano*, *vocal music*, *solfeggio and ear training*, *basic skills of dance*); b) core courses including

classroom language, *Chinese folk music*, *ethnic minority folk dance*, *computer music*, *pedagogy*, *music pedagogy*, *Chinese and western music history and appreciation of famous works*, *basic harmony*, *educational policies and regulations*, *campus dance creation*, *psychology*, *piano accompaniment*, *music form and work analysis*, *accordion*, *cultural project creation and planning*, and *thesis writing*; and c) practical courses including experimental teaching (i.e., *teachers' professional skill training*, *campus chorus organization and training*) and teaching practicum (i.e., *educational internship*, *field experience*, *teaching practice*, *graduation teaching design*, and *graduation thesis*).

In addition, School *A* offers a variety of elective courses: classical dance basic training, piano, piano vocal music accompaniment, chorus commanding, computer music, educational knowledge and ability, musical instrument performance, vocal music, vocal music stage performance, solfeggio and ear training, music education theory, music disciplinary knowledge and teaching, music work analysis, Chinese national folk dance, electronic piano, song writing, dance performance, introduction to school music teaching materials and teaching methods, music aesthetics, history of Chinese and foreign music education, teacher professional development theory and practice, modern dance, campus song and dance creation, music courseware production, and classical dance body rhyme.

By examining the program curricula, all four evaluators agreed that School *A* has the best curricula for its music education program. It has a good balance between the music and education courses. However, School *B* and *C* should have more education courses included in their programs for training qualified Grades 1-12 music teachers. "*Music teachers in Grades 1-12 schools must possess strong knowledge and skills in both teaching and music, which requires the music training program to offer the teacher candidates courses in music and education*," as commented by Evaluator *F*. Evaluator *G* further explained that "*School B and C should include more education courses so that their students received good training in becoming good music teachers in the classrooms after they finish their programs*."

4.5. Major areas for improvement in instructional methods

Again, by examining the instructional methods of these three programs, all four evaluators agreed that School *A* has the best instructional methods for its music education program. The instructional methods adopted by School *A* include lecturing, discussion, group practice, and demonstration. However, "*the instructional methods adopted by School B and C are mainly group lecturing and one-on-one and one-on-two practice, which may be appropriate for teaching music, but not for training music teachers*," as argued by Evaluator *D*.

Evaluator *E* continued to comment that "*instructional methods should be designed to facilitate student learning. Curriculum developers need to be aware of the types of teaching strategies that will effectively support the attainment of program goals and objectives*." Furthermore, Evaluator *G* made the following comments: "*education courses should be designed from a constructivist perspective, which holds that knowledge is created through social interactions. Learning is seen as a developmental process enhanced by the ability to view problems from multiple angles, constructing knowledge through personal interpretations of various pieces of evidence. Teaching strategies should promote open-ended inquiry, critical thinking, and social engagement, incorporating activities like small group work, class discussions, mini-lectures, student presentations, and the use of instructional videos*."

4.6. Major areas for improvement in learning assessments

All three programs in Schools *A*, *B*, and *C* have similar learning assessments, i.e., *assessment of learning*. They include both written examinations and performance testing on musical performance at the end of each course. However, all evaluators agreed that all three schools lack *assessment for learning* and *assessment as learning* in their programs.

The major areas for improvement in their assessment programs are a) formative assessment, b) peer assessment, and c) self-assessment. All evaluators made the following comments: "*formative assessment occurs when students receive feedback that enables them to learn better in the program*" (Evaluator *D*); "*students must learn to assess their own learning so that they can understand the purpose of their learning and the skills they need to succeed in learning*" (Evaluator *E*); "*students must also learn to assess their peers' learning because peer assessment benefits not only the peers but also the students who provide feedback*" (Evaluator *F*); and "*teachers should engage students in self-reflective processes by involving them in both self and peer assessments in their learning processes*" (Evaluator *E*).

5. Conclusion

Research question 1 asked about the variability rating of the quality of the three music teacher training programs. The results indicated that the major rating variation was due to the differences in quality of these music teacher training programs. In other words, there was little variation among the four evaluators; and they rated the programs extremely consistently.

Research question 2 asked about the reliability rating of the quality of the three music teacher training programs. The results indicated that the rating of the quality of three programs by the four program evaluators was extremely consistent and unbelievably reliable, with a reliability coefficient of .81 for one rater, respectively.

The above results suggest that they are different from many other studies that used G-theory as a framework of analysis for rating variability and reliability in the context of performance assessments (e.g., Liu & Huang, 2020; Zhao & Huang, 2020). This study yielded high reliability coefficients in the context of evaluating music teacher training programs in Chinese higher education.

The final research question focused on the major areas for improvement of these programs in terms of their goals and objectives, program curricula, instructional methods, and learning assessments, respectively? First, Schools *A* and *B* need to specify the objectives of their programs. Program objectives are crucial as they define the specific knowledge, skills, and behaviors students are expected to achieve by the end of a program (Brown, 1995).

Second, Schools *B* and *C* need to have a good balance between the music and education courses. Specifically, they should have more education courses because these courses will develop candidates' competence in music teaching (Dong, 2015; Du, 2019; Huang, 2012a; Li, 2017).

Third, Schools *B* and *C* should implement more effective teaching methods, such as small group work, class discussions, mini-lectures, student presentations, and instructional

videos. A range of instructional strategies should be employed to ensure that all students have equal learning opportunities, regardless of their individual learning styles and preferences (Brown, 1995; Tong & Yin, 2018; Xu, 2016).

Finally, all three schools should include *assessment for learning* and *assessment as learning* in their programs. Assessments are very important to any curriculum or educational program. These assessments enable both teachers and students to evaluate learning progress and ensure material comprehension. Various assessment techniques can be used, including standard tests or assignments, which offer students the chance to demonstrate their understanding in a less stressful, more authentic manner (Brown, 1995). Moreover, given that students have diverse learning styles, and to model a range of assessment strategies, multiple assignments should be utilized to evaluate student learning and performance in these programs.

This study has two limitations. First, its focus on only three music education programs may limit the applicability of the findings to all such programs nationwide. Second, only four evaluators were invited to evaluate the quality of these programs, which may limit the explanation and interpretation of the results.

Given these limitations, two main conclusions were drawn. First, the evaluation of these programs by the evaluators was highly consistent and reliable. Second, the three music education programs included in this study need to improve their program objectives and curricula, as well as the instructional methods and learning assessments.

The findings from this research offer significant insights for music education program developers in Chinese colleges and universities. In order to train qualified music teachers for Grades 1-12 schools, they need to keep in mind the core elements of a well-developed program, i.e., program goals and objectives, program curricula, instructional methods, and learning assessment. In developing their programs, they need also make sure that these programs meet the needs of Grades 1-12 schools.

To determine the specific needs of a school, a needs analysis should be conducted before developing programs. This analysis involves systematically collecting and examining all pertinent information necessary to meet the learning needs of students within the specific context of the institutions involved (Brown, 1995). It needs to be completed at the start of any program development process to ensure that the program reflects the needs of Grades 1-12 schools. This is because the needs analysis has a great impact on the quality of the entire program.

Ethics Approval and Consent to Participate

This study adhered to the ethical guidelines outlined in the *Code of Ethics for Research in Education* as established by the American Educational Research Association. Ethical approval was obtained from the Research Ethical Review Board of the Evidence-based Research Center for Educational Assessment at Jiangsu University. The participants provided their written informed consent to participate in this study.

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Conflict of Interest

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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