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Music teachers' professionalism: Realizing intercultural competence in guzheng education when using a MOOC

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Abstract

The proliferation and increasing application of modern technology have led to the improvement of tactics used to teach to play guzheng, the Chinese national instrument. This study aimed to investigate the effectiveness of using MOOCs (Massive Open Online Courses) for this purpose to argue on the possibility of reforming guzheng instruction in Chinese schools. The basis of this investigation was represented by a specially developed MOOC and an online survey. Verification of the collected data was made by means of Fisher's exact test. As research participants, 88 seventh graders and 10 teachers from three schools in China (China, Taiyuan, Jinzhong) were invited. The time frame this study covered was from February to June of the 2020-2021 academic year. The outcomes obtained from the conducted experiment indicate that the lowest grades were obtained by students who took traditional guzheng lessons and did not take advantage of online learning (71.1, 72.9, and 73.0 for each institution, with an average of 72.3). At the same time, the results of respondents who were additionally involved in the dedicated MOOC were notably higher: 78.8, 78.1, and 79.2, with an average of 78.7 (8.1% better). These data show that the use of modern technology when teaching students to play guzheng is effective. The outcomes of the survey on students' impressions from the proposed learning course and its usefulness revealed that 98% of all the persons involved were satisfied with their participation in the MOOC. Students showed high support for the statements claiming MOOC's positive impact on teachers' intercultural professionalism in guzheng teaching and overall approach to instruction. The practical and scientific significance of this study resides in the fact that it demonstrates the effectiveness of modern technology, particularly distance learning platforms, in the context of guzheng learning. This paper demonstrates clearly that through the use of additional multimedia, better results can be achieved.

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1 Introduction

Learning in the context of cultural diversity has become increasingly common due to various social phenomena, global mobility, and the ability to carry out the educational process from anywhere in the world using Web 2.0 services (Lind & McKoy, 2016). However, in situations when students' different cultural backgrounds can create challenges for interaction and collaboration, educators need to rely on their intercultural competence – the ability to communicate effectively and appropriately in intercultural settings using their cross-cultural knowledge, skills, and attitudes (Spitzberg & Changnon, 2019). Even though developing intercultural competence is extremely useful in educators' work, it requires a reflective view of one's own work. In an intercultural context, it is essential that teachers first be given opportunities to increase their critical self-reflection on cultural diversity. Only by understanding their feelings, reactions, motivations, and the ways they affect thoughts, behaviors, and actions in intercultural situations can educators consciously build their intercultural competence, particularly in music education (Feucht et al., 2017).

At the moment, open online courses (Ma & Ma, 2022) are particularly popular and frequently used in music education. Massive open online courses (MOOCs) are designed to provide students with large-scale, exclusive, and open-access courses. Recently, the algorithm for recommending courses in MOOCs has attracted the attention of many researchers (Zhang et al., 2023). The MOOC may include filmed or recorded video lectures, readings, problem sets, online quizzes and exams, interactive learning modules, and interaction with other students through forums. Typically, MOOCs are used for higher education and career advancement. Nevertheless, due to the coronavirus pandemic, many public school districts and undergraduate degree programs have implemented MOOCs as the new standard (Chai & Wigmore, 2021).

MOOC has a relatively complete curriculum structure, curriculum goals, coordinator, topic, schedules, and assignments. It is an open form of education with no limitation on the number of people involved, time, and location. All resources and information in the course are open and shared via the internet. Learners can use a variety of tools or platforms to participate in learning according to their preferences, such as wikis, blogs, and social networking sites, which makes the course not limited to specific platforms (Wu, 2018). Along with this, MOOCs allow students to discuss course-related topics and engage in group activities, thinking, and communication (Lu, 2015).

As for the traditional way of teaching to play guzheng, educators shared their knowledge in an offline mode and demonstrated the playing technique for students to follow it; no new approaches to guzheng playing were proposed. Since students learned by processing teachers' knowledge, they could not show their enthusiasm and initiative fully, which hindered the development of their playing skills.

The experimental implementation of the MOOC not only sought to improve the quality of learning and reduce the shortage of learning resources. It also aimed to yield good learning outcomes by giving an opportunity to upload educational videos, receive detailed guidance from professional guzheng teachers, and communicate with other students possessing better knowledge and skills.

Guzheng is one of the most distinctive national musical instruments of China. It allows creating unique and beautiful melodies. Playing guzheng is an important part of Chinese musical culture. However, the aesthetic needs of music are gradually growing, and traditional guzheng skills can hardly keep pace with them. In view of this, today, guzheng should absorb elements of the new era, experience innovation, and evolve (Zhang et al., 2018).

As regards current guzheng education, many of its problems are related to the lack of innovative skills among teachers. Poor innovative consciousness is usually attributed to an old-style way of teaching and short class periods as time does not permit innovation (Magen-Nagar & Shachar, 2017). Along with this, many colleges and universities offering guzheng training often put the core emphasis on academic performance improvement and ignore students' future development, which actualizes the need to develop novel approaches able to raise music teachers' professionalism (Yang, 2020). The first thing to do in this aspect is to propose teaching goals under the new curriculum reform while combining them in systematic teaching plans (Li, 2018).

This study provides an original insight into the consequences modern technology has on guzheng learning. An analysis of the development of guzheng playing skills, as well as guzheng performance and teaching, using modern instruments is relevant because it can provide alternative approaches to address the problems arising in the process of guzheng learning and suggest yet other strategies to improve its quality. Guzheng was chosen as the central musical instrument because it is the national musical instrument of the PRC, but it is not widely studied, which gives motivation for its study.

The practical and theoretical significance of this paper resides in the fact that it can give one more impetus for innovating the system of modern music education in China. Guzheng learning can be considered not only in the context of face-to-face study but also under the conditions of remote education process when personal contact is not possible, as was the case with COVID-19 restrictions.

2 Literature review

In this day and age, music education is a topic of increased interest from academic world representatives. Some researchers concentrate upon the issue of educators' specialization, considering it a step backward for education due to its ability to fragment the educational process and failure to meet the needs of society (Ingersoll & Merrill, 2011). Others, in their discussion of music teachers' experience and authority, focus on the professional understanding of educators, which includes power, identity, and knowledge at personal, collective, institutional, and political levels (Angelo, 2016; Bai, 2020). The education of professional music teachers

requires well-founded pedagogical knowledge, reflexivity of values, and the priority of interpretation (Georgii-Hemming, 2013). Hence, many scholars advocate for a creative model of music teacher professionalism that emphasizes the ability to connect different aspects of knowledge to meet the needs of society (Holgersen & Burnard, 2013).

Prior research in general teacher education has shown that modern technologies act as a powerful lever encouraging cross-cultural interaction and learning (Edwards, 2011; Pennington et al., 2012). Learning to apply innovations in the working process enhances teachers' capacity for self-awareness and intercultural communication, which are integral to professional growth (Pennington et al., 2012). As a result, when these individual abilities are practiced in the class, they can also promote intercultural awareness in students, thereby creating an emotionally healthy atmosphere (Jokikokko, 2016).

While professionalism helps us understand professions as collectively expressed, some evidence suggests that music teachers first identify themselves as performing musicians. This directly affects the way of perceiving themselves in their teaching practice (Ballantyne & Grootenboer, 2012; Ballantyne & Zhukov, 2017; Southcott & Joseph, 2010). Cultural diversity in music education is often viewed from a multicultural perspective. Hence, the enhancement of musical diversity is done by adding musically diverse repertoire to the curriculum or by developing music teachers' skills in how to teach music from diverse cultures (Howard et al., 2014). However, as some scholars note, multicultural music education has not been dynamic enough to highlight the contextual (social, political, ethical) sides of a musical piece. In other words, although multicultural music education focuses on diversifying musical content and practice, it does not sufficiently address the broader social and cultural conditions involved in music teaching and learning (Westerlund & Karlsen, 2017).

The timbre of guzheng has a characteristic bright and high tone, and the music the performer creates directly depends upon the playing method used (Rahman & Manaf, 2017). The playing method is tightly linked with the effect the music creates and the performance technique, which is assessed to check one's music skills (Wang et al., 2015). At present, many beginners and even professional musicians ignore already established methods of performance and scientific teaching. Instead, they strive for speed, strength, and some fashionable unilateral skills, disregarding the performance conditions that give a deep understanding of music and neglecting the overall playing scheme (Qiu et al., 2019). At the same time, the development of guzheng playing skills is essential not only from an aesthetic perspective but also from the one designating national and international integration (Turpin & Durham, 2017). In view of this, it is critically important to master a set of approved methods of playing when undertaking guzheng classes (Yu et al., 2015).

Currently, many educational establishments focus on teaching guzheng skills but ignore learning of modern guzheng repertoires. No doubt, playing skills are critically important guzheng teaching. However, educators must also understand that guzheng art and culture must be passed down through generations of musicians, and its innovation is inevitable. Only the education that can adapt to the development trends would persevere (Sha, 2016; Yin, 2019). Consequently, to

achieve innovation in guzheng teaching methods, the first step should be based on student-centered learning, in which learning goals should be related to students' development. In the class, teachers should combine modern teaching aids with a variety of other methods, taking full advantage of online resources (Fu, 2021). In this manner, guzheng repertoire can be uploaded on sharing platforms allowing students to learn to play guzheng at any time. Likewise, teachers should encourage learners to use the internet to find the background of the repertoires that are to be taught so that they will be understood in advance. On top of this, educators can also use modern teaching approaches and tools during lessons to stimulate the interests of students in learning to play guzheng by supporting their intuitive feeling of music and emotional experiences and thus improving the quality of teaching (Zhang et al., 2015).

In order to achieve high-quality guzheng instruction under the new curriculum reform, educators need to actively innovate and overcome the time and space constraints characteristic of traditional teaching approaches. Furthermore, when developing technical skills, special attention should be paid to the issue of practice (Wu et al., 2017) as the central aim of guzheng performance is to give a listener an understanding of the performer's feelings during the play (Liu, 2015). The relationship between tradition and innovation is essential for the continuity of guzheng music culture, so to achieve greater success, it must be maintained together with a fine guzheng playing culture (Wu et al., 2017).

2.1 Research limitations

This study was conducted within three schools in China, so the results cannot reflect the impact of modern technology on guzheng learning across the country. The number of participants was also limited due to the difficulties connected with attempts to enroll students in extracurricular activities. It is also worth noting that although the evaluation criteria for guzheng lessons were uniform across the study, individuals in charge of student assessment varied from institution to institution.

2.2 Problem statement

The main motivation for this paper was the desire to obtain new experimental data on the effect of modern technology on guzheng learning. They may influence the introduction of online learning systems into classical school curricula and thereby improve the quality of education and create novel interactive learning methodologies. In addition, the collected findings may be found useful with respect to challenges associated with the impossibility of face-to-face education (like those caused by the COVID-19 pandemic).

The central goal of this research was to explore the effectiveness of innovative teaching via Massive Open Online Courses (MOOCs) to argue on the possibility of reforming the guzheng instruction in Chinese schools. In this context, it was of critical importance to ensure the realization of high-quality education, create a favorable atmosphere for school work, and improve the methods of guzheng teaching. Also,

this paper strived to find out what effect engagement in the MOOC had on learning to play guzheng compared to a control group that followed a traditional training course solely.

Before the experiment started, the following objectives were formed:

1. Analyze the effectiveness of MOOCs in learning to play guzheng by comparing two groups: control group (CG; classes were conducted under the traditional curriculum) and experimental group (EG; students were additionally involved in the MOOC).
2. Discover the effect of the traditional curriculum and MOOCs on the success of guzheng learning (including with reference to students' gender).
3. Discover the effect of using MOOCs in teaching to play guzheng through an online-based student survey (including in the context of teachers' intercultural competence).

3 Methods and materials

The experiment conducted within the limits of this research was grounded on the MOOC – a web-based distance learning program designed for a large number of geographically dispersed students. It should be noted that the creator of MOOC.org was not a party in interest and had no personal benefit from its mentioning. Its use was dictated by scientific interest in the research topic and was not a promotional move.

The content of an educational program developed specifically for this study encompassed group tutorials, viewing lessons by internationally renowned guzheng masters, joint activities, and improvisations. The MOOC-based educational approach was aimed at promoting participation, enthusiasm, and self-expression. The main purpose of online lessons was to engage students in activities that could be practiced at home.

Most MOOC-based lessons were designed in a way to provide adaptive guzheng parts with simple assignments. Improvisations were presented in group lessons and were developed individually. Topics and assignments designed to stimulate creative thinking and improve guzheng skills were diverse. All MOOC activities were carefully prepared and planned by the teacher of each group based on their professional experience and personal views. The only requirement was to agree on children's right to participate in artistic experiences in a variety of contexts. Most of the materials were created and uploaded to the developed MOOC specifically for this study.

In total, the experiment involved 88 seventh graders and 10 teachers from three schools in China (China, Taiyuan, Jinzhong) denoted as X, Y, and Z due to confidentiality reasons. The study period covered was from February to June during the 2020-2021 academic year. The age of the students ranged from 12 to 13 years old, but since the influence of age was not considered in the context of this research, precise data on this parameter were not collected. More detailed

Table 1 Research sample composition

Educational institution	Students (total)	CG	EG	Teachers
X	29	14	15	3
Y	29	14	15	3
Z	30	10	20	4
Total, people	88	38	50	10
Total, %	89.8	38.8	51.0	10.2

information regarding the number of participants from each institution is presented in Table 1.

School officials, teachers, students, and their parents (or foster parents) were fully informed of the study details. Participants were selected voluntarily by oral suggestion; a child who showed interest in the research and whose parent or foster parent gave written consent to the processing of personal data and confirmed the child's participation in the study was considered involved. Students' distribution into EG was based on their willingness and permission of one of their parents (or foster parents) to receive additional guzheng lessons via the MOOC. The remaining students were assigned to the CG (the consent from themselves and one of their parents or foster parents was also necessary). None of the students or teachers were forced to participate. No respondents expressed a desire to quit the experiment before its end.

The study was conducted over five months, during which all students enrolled attended traditional guzheng lessons, whereas EG participants had additional hour-long MOOC-based lessons twice a week. For more convenient online work, EGs were divided into smaller groups, five students per teacher. In order to avoid misunderstandings and errors, educators conducted preliminary training on how to use MOOC materials. However, the students were informed that they could contact their teachers if any questions regarding the functionality arose.

At the end of the study, each institution's guzheng teacher monitored the groups according to a standard curriculum. Grades were given on a five-level scale, with 100-90 being excellent, 89-80 being good, 79-70 being satisfactory, 69-60 being pass, and below 60 being fail. The assessment criteria were as follows: in-class work, homework (independent work), modular assessment (playing a guzheng work according to the curriculum), group work (playing a guzheng work in the group), and final assessment (final exam).

Apart from this, students were addressed a specially developed online survey (Appendix A). All questionnaires were filled out completely; no irrelevant answers were given as otherwise the online form would not have been successfully uploaded to the server. The survey contained ten statements aiming to assess the effectiveness of using MOOCs in the context of professional development of teachers. The process of surveying presumed respondents to indicate to a what degree they agree with the given statements on a four-point Likert scale, where:

1- Strongly agree (SA)
2- Agree (A)
3- Disagree (D)
4- Strongly disagree (SD)

4 Results

A factor analysis framework was used to control the data of this study. Fisher's exact test (p) was applied to infer whether there was a significant difference between the two groups (CG and EG). All data were considered satisfactory in accordance with the benchmarking criteria proposed by statisticians. The adequacy and validity of the data were ensured.

The outcomes collected for each questionnaire statement are presented below. Since Statement 1 aimed to analyze the effectiveness of using MOOCs to teach guzheng, assessment of the results achieved by the two groups of students according to the defined criteria was critical. After reporting on student assessment, the analysis of study participants' responses to Statement 1 was performed.

Table 2 presents data on students' performance in guzheng playing at the end of the experiment (June 2021). Provided that all p values are below 0.05, which is the threshold, differences between indicators are significant.

The lowest grades were obtained by CGs who received traditional guzheng training and did not turn to the use of online platforms: 71.1, 72.9, and 73, with an average of 72.3. In contrast, EGs, whose participants were additionally involved in the MOOC, showed higher grades at each institution: 78.8, 78.1, and 79.2, with an

Table 2 Students' grades according to selected assessment criteria, by group and gender

Assessment criteria	Gender	X		Y		Z		Mean
		Grades on a 100-point scale						
		CG	EG	CG	EG	CG	EG	
1. In-class work	♂	68	70	69	72	70	74	70.5
	♀	69	74	70	72	71	74	71.7
2. Homework	♂	71	76	71	73	71	84	74.3
	♀	73	78	71	74	75	88	76.5
3. Modular assessment	♂	72	76	74	75	69	71	72.8
	♀	72	79	74	81	71	73	75.0
4. Group work	♂	69	81	75	79	73	81	76.3
	♀	71	84	76	84	74	85	79.0
5. Final assessment	♂	72	84	74	85	78	80	78.8
	♀	74	86	75	86	78	82	80.2
Mean		71.1	78.8	72.9	78.1	73.0	79.2	X
p value		0.019	0.024	0.039	0.021	0.017	0.034	X

average of 78.7 (8.1% higher than that of the CG). Based on these data, one can conclude on the effectiveness of the use of MOOCs in the context of teaching students to play guzheng. The difference between the groups was especially noticeable when group work and final assessment results were analyzed.

As for the gender peculiarities, the collected data showed that male students' results were worse at all criteria, even though insignificantly. Thus, the average grade for male students constituted 74.5, while for females, this indicator was at the level of 76.5.

The third objective of this study was to determine the effectiveness of using MOOCs in teaching to play guzheng, including in the context of teachers' intercultural competence. The use of an online-based student survey for this purpose was due to the fact that teacher effectiveness is determined by analyzing students' achievements and impressions from the learning process.

The survey outcomes describing students' impressions from the proposed MOOC and its perceived usefulness in terms of guzheng learning are presented in Table 3. The collected data indicate that students were satisfied with their participation in the MOOC-based guzheng learning (Statement 1) as the cumulative percentage of SA and A answers is 98%. Also, participation in online MOOC-based lessons with classmates and the teacher helped 86% of students master their guzheng skills (Statement 2). The statement uncovering whether respondents liked learning guzheng using modern technology more than via traditional in-class instruction (Statement 3) received support from 98% of respondents. In the meantime, as many as 92% of students declared that the MOOC had a positive impact on the professionalism of their guzheng teachers (Statement 4), and 90% believed that the use of the MOOC improved their guzheng teaching methods (Statement 5).

Of particular interest was to investigate whether the use of MOOCs helped to strengthen artistic expression skills while performing guzheng melodies (Statement 6). It turned out that as many as 80% of students expressed support for this effect. In a similar vein, 90% of respondents declared that the use of modern technology has a positive effect not only on the guzheng skills themselves but also on other creative inclinations (Statement 7).

No less important was that 96% of students claimed the introduction of modern technology in the process of learning to play guzheng to be rather helpful than not (Statement 8). As concerns the difficulties with the MOOC in the context of guzheng training, 14% of all the individuals surveyed reported on some problems experienced while learning under the proposed methodology (Statement 9). According to after-survey interviews, these problems were mostly related to the lack of direct contact with the teacher, as well as the connection to the internet. However, it is worth noting that respondents evaluated the positive effect of MOOC implementation on their motivation and interest in learning – the support rate for this statement was 82%, which is quite significant (Statement 10).

For a better understanding, students' impressions from using the MOOC to learn to play guzheng were presented in the form of a diagram (Fig. 1).

The data collected enable the inference that students' overall impressions from participation in MOOC-based guzheng learning activities were highly positive.

Table 3 Results of student survey on the effectiveness of MOOC-based guzheng learning course

Statement	Students			Statement	Students		
	Response	Frequency	%		Response	Frequency	%
1. Overall, I am satisfied with my participation in the MOOC-based guzheng learning	SA	35	70.0	6. I believe that the developed MOOC helped me to strengthen my artistic expression skills while performing guzheng pieces	SA	14	28.0
	A	14	28.0		A	26	52.0
	D	1	2.0		D	8	16.0
	SD	0	0.0		SD	2	4.0
2. Participation in MOOC-based lessons together with my classmates and teacher helped me become more proficient in guzheng playing	SA	18	36.0	7. I believe that continuing to use MOOCs to teach guzheng playing will broaden my knowledge and develop my professional abilities	SA	14	28.0
	A	25	50.0		A	31	62.0
	D	6	12.0		D	4	8.0
	SD	1	2.0		SD	1	2.0
3. I find learning to play guzheng using modern technology more interesting than traditional in-class instruction	SA	41	82.0	8. Introducing modern technology into the learning to play guzheng is rather useful than not	SA	36	72.0
	A	8	16.0		A	12	24.0
	D	1	2.0		D	2	4.0
	SD	0	0.0		SD	0	0.0
4. I believe that using MOOCs positively influenced the professionalism of my guzheng teacher	SA	28	56.0	9. I encountered a number of difficulties in the process of working with the MOOC	SA	4	8.0
	A	18	36.0		A	3	6.0
	D	4	8.0		D	21	42.0
	SD	0	0.0		SD	22	44.0
5. I believe that using MOOCs contributed to the improvement of guzheng teaching methods	SA	18	36.0	10. Learning to play guzheng in an online mode had a positive effect on my motivation and interest in learning	SA	20	40.0
	A	27	54.0		A	21	42.0
	D	4	8.0		D	8	16.0
	SD	1	2.0		SD	1	2.0

**SA* strongly agree, *A* agree, *D* disagree, *SD* strongly disagree

**$p < 0.05$

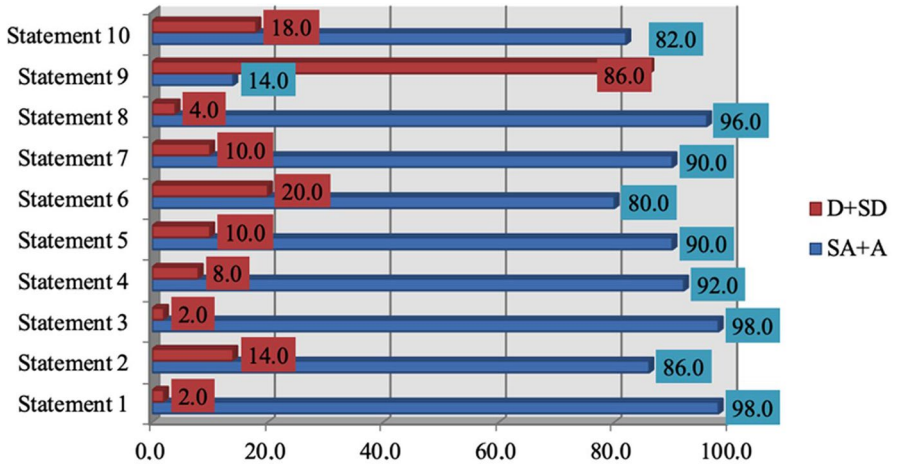

Fig. 1 Overall students' impressions from using the MOOC to learn to play guzheng

They expressed a great deal of support for the use of modern technology and the implementation of advanced practices in the learning process (Statements 1,3,8).

To a slightly lesser extent, students were unanimous that participating specifically in MOOC-based lessons with classmates and the teacher helped them master guzheng better. However, statements about the positive impact of MOOCs on guzheng teachers' professionalism and teaching methods improvement were strongly endorsed by most respondents. The least supported (80%) was Statement 6, the purpose of which was to find out whether the use of MOOCs helped to strengthen artistic expression skills during the performance of guzheng tunes.

5 Discussion

Our fast-changing world necessitates guzheng teachers and students to continuously accumulate profound cultural backgrounds (Li, 2018). According to some researchers, when teaching guzheng, educators are not only required to understand the unique style of guzheng playing but also to explain the very essence of artistic performance (Jia et al., 2014). This fact partially resonates with the lowest impact of multimedia learning on artistic expression skills recorded within the current examination, which pushes the search for new ways and technologies to develop students' creativeness. Correspondingly, to improve the quality of guzheng teaching, teachers and schools must give greater consideration to combining the unique style of national music with current tendencies. This would enable guzheng music evolution and allow achieving the goal of inheriting classical Chinese consciousness (Fu, 2021; Jia et al., 2014).

Some scholars indicate that there are several ways to improve guzheng teaching. These include developing the technical background, fostering students'

good attitudes toward learning, paying due attention to physical education, and regular music comprehension improvement activities (Peng, 2016). Scholars agree that music understanding and perception are critical in promoting culturally diverse music education (Cain, 2015). Along with self-reflection, they are seen as key skills in the field of culturally responsive music pedagogy (Lind & McKoy, 2016). In the current study, these methods and postulations were partially implemented, and the collected positive results indicate the relevance of these statements.

Guzheng teaching methods involving the integration of "music" and "technology" attract increasing attention these days (Fu, 2021). Researchers state that the traditional teaching process is often tightly linked with students' negative attitude towards learning to play guzheng because of undifferentiated and sometimes outdated teaching methods. In line with this, the outcomes of the conducted research demonstrated the progress in students' motivation after the introduction of the web-based learning model. Thus, it would be reasonable to conclude that in modern guzheng education, teachers should promote "music" and "technology" integration to propose a more diversified learning environment and create a good learning atmosphere (Peng, 2016). The results of another study show that students will be more satisfied with MOOCs if instructors increase the relevance of courses on relevant topics, and the relevance effect is large for advanced courses and is enhanced by the accessibility of the experience for students (Wang & Song, 2022).

By its very nature, the traditional teaching model is a fixed pattern where teachers teach or tutor while students just attend and learn. Its effect is particularly clear in teaching to play guzheng. Existing evidence demonstrates that traditional education approaches significantly inhibit students' individual development because, over time, students' enthusiasm wanes, and their guzheng playing inspiration is suppressed (Fu, 2021).

Traditional guzheng teaching methods used in China are rather simple and dull in content, which makes students gradually lose interest in learning (Tu-Yong, 2013). In turn, the current work proved that the combination of "music" and "technology" helps mobilize students' enthusiasm and initiative and deepen their understanding of music to some extent. In light of this, more consideration should be given to the mobilization of students' initiative and combination of learning through literature and modern technologies to find new ways to understand the story behind the music (Wang-Shu, 2014; Wu, 2017).

6 Conclusions

The data on students' guzheng playing achievements collected from three schools in China indicated that the lowest grades were obtained by students who took traditional guzheng lessons and did not take advantage of online learning technologies (71.1, 72.9, and 73.0, with an average of 72.3). On the contrary, EGs, whose participants were additionally involved in the specially developed MOOC, had higher grades at each institution: 78.8, 78.1, and 79.2, with an average of 78.7 (8.1% higher than that of the CG). These findings allow the inference that the use of modern

technology in the context of teaching students to play guzheng is effective. The difference between the groups was especially noticeable when group work and final assessment results were compared. As concerns the gender specifics, the study evidenced that male students' results were somehow worse. The average for males was 74.5, while for females – 76.5.

The outcomes of the survey on students' impressions from the proposed learning course and its effectiveness in learning to play guzheng uncovered that 98% of students were satisfied with their participation in the program. Similarly, 86% of them noted that involvement in MOOC-based lessons with classmates and the teacher helped them become more proficient in guzheng playing. As many as 98% of students declared that they liked learning guzheng skills using modern technology more than traditional in-class instruction. In the same fashion, 92% of the surveyed claimed that the proposed MOOC positively affected intercultural professionalism of their guzheng teachers, and 90% believed that elaboration of the MOOC had a favorable effect on their view of guzheng teaching.

Another interesting aspect this research unveiled was that the use of MOOCs helped students strengthen their artistic expression skills while performing guzheng tunes (as argued by 80% of respondents). While 90% of the surveyed argued that the use of modern technology has a positive effect on the guzheng skills and other creative inclinations, 96% described the introduction of modern technology in the process of learning to play guzheng as helpful. As for the difficulties with the MOOC in the context of guzheng training, 14% of students claimed that they did have some problems while taking the proposed course. Though, these problems were mostly related to the lack of direct contact with the teacher and unstable internet connection. In general, the positive effect of the MOOC on motivation and interest in learning to play guzheng was confirmed by 82% of all interviewed individuals, which is quite significant.

The practical and scientific value of this research lies in the fact that it demonstrates the effectiveness of modern technology, particularly distance learning platforms, in the context of guzheng learning. This paper evidences that through the use of additional multimedia, better results can be achieved. In addition, it sheds light on the consequences of implementing a MOOC as an organized and planned public learning plan suitable for international education. These conclusions may be found useful for further research on similar topics.

The application of the collected findings is seen in educational programs and research works conducted in China and abroad. The provided inferences may become one more stimulus for the popularization of modern technology in the process of learning to play guzheng and their further official inclusion in educational programs. In a global sense, our society is facing an increasing number of new challenges, like the COVID-19 pandemic, severely affecting the entire planet, but the educational process should never stop whatever might be the situation. Hence, in the context of distance learning, online platforms can be found extremely useful. Future studies should concentrate upon the long-term effects of modern technology implementation on learning to play guzheng, pay attention to the limitations presented in this article, and continue research on this topic. Schools, in turn, should work on creating effective learning platforms

with the content available online so that students can engage in learning without any restrictions. In this fast-changing world, educational institutions should keep abreast of the times and try to promote traditional Chinese music culture with the most innovative teaching models available.

Appendix

Questionnaire

Please express your opinion regarding the statements provided further by expressing your agreement/disagreement on a four-point scale:

1- Strongly agree (SA)
2- Agree (A)
3- Disagree (D)
4- Strongly disagree (SD)

1. Overall, I am satisfied with my participation in the MOOC-based guzheng learning.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

2. Participation in MOOC-based lessons together with my classmates and teacher helped me become more proficient in guzheng playing.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

3. I find learning to play guzheng using modern technology more interesting than traditional in-class instruction.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

4. I believe that using MOOCs positively influenced the professionalism of my guzheng teacher.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

5. I believe that using MOOCs contributed to the improvement of guzheng teaching methods.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

6. I believe that the developed MOOC helped me to strengthen my artistic expression skills while performing guzheng pieces.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

7. I believe that continuing to use MOOCs to teach guzheng playing will broaden my knowledge and develop my professional abilities.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

8. Introducing modern technology into the learning to play guzheng is rather useful than not.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

9. I encountered a number of difficulties in the process of working with the MOOC.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree*

10. Learning to play guzheng in an online mode had a positive effect on my motivation and interest in learning.

○ *1. Strongly agree* ○ *2. Agree* ○ *3. Disagree* ○ *4. Strongly disagree.*

Data availability Data will be available on request.

Declarations

Conflict of interests This research has no conflict of interests.

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