

# The Piano Tuning and Maintenance Teaching in University in China

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## Abstracts

Nowadays, the development of the music industry is inseparable from scientific and technological innovation. With the development of the new media industry and the frequent use of smart phones, the application of technological innovation in music practice is becoming more and more important, and the demand for talents who are good at music technology theory and practice will also increase. Music and musical instrument production-related graduates have a wide range of employment opportunities. In addition to being able to engage in sound design and recording in radio, television, and film systems, they can also work in many commercial performance companies, film and television organizations, and even teach in colleges and universities. Some school graduates have even reached a level where demand exceeds supply. This article presented the piano tuning and maintenance teaching in college and universities in China.

**Keywords:** Piano Tuning; Piano Maintenance; Teaching; University; China

## Introduction

The major of piano tuning and maintenance belongs to the major of musical instrument engineering under the category of music engineering major, which includes: music design and production, musical instrument design and production, recording art, electronic music composition, electronic music production, music therapy, art and technology, music and media, etc. The learning content is roughly: composition, arrangement, recording art, sound director, music editing, electronic music composition, musical instrument engineering, sound engineering, etc. In China, key music colleges and universities such as the Central Conservatory of Music, Shanghai Conservatory of Music, Communication University of China, Chinese Opera Academy, Xinghai Conservatory of Music, Zhejiang Conservatory of Music, etc. have now opened music and musical instrument production related majors and directions. Nowadays, the development of the music industry is inseparable from scientific and technological innovation. With the development of the new media industry and the frequent use of smart phones, the application of technological innovation in music practice is becoming more and more important, and the demand for talents who are good at music technology theory and practice will also increase. Music and musical instrument production-related graduates have a wide range of employment opportunities. In addition to being able to engage in sound design and recording in radio, television, and film systems, they can also work in many commercial performance companies, film and television organizations, and even teach in colleges and universities. Some school graduates have even reached a level where demand exceeds supply.

In order to better explain the relationship between the major of piano tuning and the major of musical instrument engineering, I would like to take the musical instrument engineering department of Xinghai Conservatory of Music, which is adjacent to Guangdong Literary & Art Vocational College, as an example. This major was first established in 1986. At that time, only students majoring in piano tuning at the intermediate professional level were recruited; until 2002, the major of piano tuning and maintenance at the undergraduate level was formally established; in November 2006, an independent "Musical Instrument Technology Teaching and Research Office" was established; The Department of Musical Instrument Technology was formally established; in 2014, it officially recruited postgraduate students majoring in Musical Instrument Technology; in April 2016, in order to meet the school's orientation of running a school, and strive to build a social demand-oriented, cultivating both moral and artistic talents with innovative spirit and practical ability, high-quality art professionals, the school decided to change the original "Musical Instrument Technology Department" to "Musical Instrument Engineering Department", which put forward higher requirements for the school-running and training goals of this major.

The Musical Instrument Engineering Department of Xinghai Conservatory of Music has expanded from one professional direction to two main directions and diversified training modes. Under the model of teaching piano tuning and stringed instrument production (violin, guitar) as the main body, it also has a teaching and research section for piano repair technology and stringed instrument production. At the same time, a musical instrument design and production research center and a musical instrument engineering project practice training center have been set up, thereby increasing the cultivation of students' professional learning practical ability and innovative ability. With the help of master workshops, students can carry out various musical instrument research and learning activities under the leadership of musical instrument learning.

The Musical Instrument Engineering Department of Xinghai Conservatory of Music currently has a young, wide-ranging, professional and excellent professional teaching staff. It is composed of outstanding talents who graduated from the Central Conservatory of Music, Shenyang Conservatory of Music, Wuhan Conservatory of Music, Xinghai Conservatory of Music and other domestic famous music academies, as well as overseas returnees from Italy's Cremona International Violin Making School and Milan Conservatory of Music.

The Musical Instrument Engineering Department of Xinghai Conservatory of Music has established relatively complete teaching facilities during the years of development and construction. It has established a number of professional auxiliary teaching and experimental practice sites such as a piano repair studio, a violin production studio, a guitar production studio, a material warehouse, a mechanical equipment room, a 3D numerical control mechanical equipment laboratory, and an acoustic digital monitoring room for musical instruments. At the same time, it cooperates with well-known musical instrument companies in many countries to play the role of collaborative education in teaching, establishes a fixed and long-term teaching practice base, implements the combination of schools and enterprises, promotes the integration of industry and teaching, and strives to broaden students' practice and employment channels. At the same time, it focuses on improving students' awareness and ability of innovation and entrepreneurship.

## **Piano tuning and maintenance major in colleges and universities**

The job of a piano tuner is to tighten or loosen the strings to achieve a certain pitch and interval, and to optimize the quality of the sound and the sensitivity of the piano's mechanics. Taking the first international standard pitch as an example, the tuner must adjust the vibration frequency of the 49th key of the piano to 440 Hz, and follow the twelve equal temperament of the piano to adjust each note of the piano. The job of a piano tuner is not only to adjust the tone, but also to maintain the proper functioning of the interior of the piano. A piano is a complex piece of machinery, and a tuner must ensure its precise working, good piano performance, and musicality.

With the rapid development of the piano education industry, the piano-related industries and market prospects are broad, resulting in a sharp increase in the shortage of piano tuning lawyers. Therefore, the training of piano tuning lawyers has become a top priority. In China, the piano tuning and maintenance industry has developed very maturely, and the number of pianos in China is increasing day by day. According to statistics from Huajing Industrial Research Institute, the number of pianos in China continued to grow between 2016 and 2021. In 2016, the number of pianos in China was 6.12 million, and it will increase to 8.648 million in 2021. Naturally, the demand for piano tuning lawyers is also increasing. In China, a qualified piano tuning lawyer needs to pass the assessment of the Piano Tuning Industry Association and be issued a tuning lawyer qualification certificate before he can conduct tuning work for the society. The way to learn piano tuning skills is not only in colleges and universities. People in the society can learn piano tuning skills through tuning industry associations, vocational training schools, or training courses for tuners organized by a certain piano brand. For example, the "KAWAI & PARSONS Piano Tuning Lawyer Training Course" established by Liaoning Piano Tuning Association, Shandong Haiyun Vocational Training School, Japanese piano brand KAWAI and China Parsons Music Company. These trainings are mainly to greatly improve the skills of piano tuning within a certain period of time, so that learners can pass the skill test, obtain the qualification certificate of the national labor department, and become a qualified tuner. Outside of the training time, some associations also use the network platform to exchange and share professional skills among peers. However, the training time of these training courses is shorter, ranging from one week to one year. In contrast, in college teaching, students have 3-4 years of study time, which means that college students can have a more systematic learning framework, learn more comprehensive skills and theoretical knowledge, and have more time to train piano tuning and piano maintenance. According to incomplete statistics, in China, at least 30 institutions of higher learning offer related majors including piano tuning and maintenance. For example, the major of piano tuning offered by the Central Conservatory of Music, the major of piano tuning offered by Xi'an Conservatory of Music, the major of musical instrument engineering offered by Xinghai Conservatory of Music, the major of musical instrument repair of Jinan University School of Music, the major of piano tuning of the Musical Instrument Repair Department of Nanjing University of the Arts, the major of piano tuning of Qingdao Vocational and Technical College, the major of piano tuning of Guangdong Literary & Art Vocational College, etc. The structure of professional courses in colleges and universities is very clear. Professional courses are composed of professional basic courses and professional core courses. Professional basic courses include but are not limited to Introduction to Art, Introduction to Musical Instruments, Music Theory, Solfeggio, Harmony, Chinese Music History, Western

Music History, Music Appreciation, etc.; The major of piano tuning and maintenance is committed to cultivating all-round development of morality, intelligence, physical fitness, art and labor, mastering a solid scientific and cultural foundation, basic principles of piano tuning, basic music literacy, intelligent piano assembly and other knowledge, having the ability of piano tuning, trimming, tuning, and intelligent piano assembly and tuning, with craftsman spirit and information literacy, high-quality technical and skilled talents who can engage in piano tuning and repair, assembly and repair, intelligent piano installation and tuning, etc. There are three types of Chinese tuner qualification certification. The first is the certificate issued by the China Light Industry Vocational Skills Appraisal Station, which is divided into three types: primary, intermediate and advanced; the second is the tuner qualification certificate issued by the China Musical Instrument Association.

In Japan, where there are two well-known piano brands, YAMAHA and KAWAI, the training of tuning lawyers has been throughout the history of piano development in Japan. The piano tuning majors in Japanese schools have a richer level of students and are more closely connected with piano factories. After graduation, most of the students go directly to the musical instrument factory for piano tuning, piano installation, debugging and finishing, and maintenance technology. Taking the Japan Tuning Lawyers Association as an example, the qualification certification of tuning lawyers in Japan is divided into three levels, the first level is the highest. For those who pass the first-level technical skill test, the skill certificate will be issued in the name of the Minister of Health, Labor and Welfare. For those who pass the second and third level technical skill tests, the certificate will be issued by the chairman of the Japan Piano Tuner Association, a designated examination institution. Those who earn a certificate of competency can call themselves an "O-rated piano tuner" and can be listed on business cards, websites, etc. (If the unqualified person claims to be a certified technician, he will be fined up to 300,000 yen.)

In the United States, there are not a few universities offering tuning majors. Like China and Japan, the United States also has mature college piano tuning majors and piano tuning and maintenance industry associations. Universities such as Oberlin College and the North Bant Street Technician School (NBSS) in the United States offer piano tuning majors. Piano tuning in Oberlin College is one of the branches of the piano department. It is worth mentioning that the registered piano technician (RPT) in the United States is a qualification certificate issued by the piano technicians' guild in North America. RPT is also an authoritative skill qualification certification recognized by most countries and institutions.

Looking at the above-mentioned countries, we can find that the piano tuning and maintenance majors in colleges and universities are very standardized and systematic. In the practice of piano tuning teaching in colleges and universities for many years, we found two phenomena worthy of in-depth study. One: students do not have enough mastery of piano parts, and they are relatively unfamiliar with the internal structure of the piano and the location of parts, which will make them feel difficult in professional learning. In response to this phenomenon, we believe that adding the course "Piano Design Technology" will enable students to have a deeper understanding of the piano structure and the function of each part during the design process; another important reason for learning design technology is that we believe that the design technology course can effectively solve the problems students encounter in professional practice. For example, in the restoration of the ancient piano, students will encounter the situation that the parts are severely corroded and need to be replaced or they cannot be used. This is a common problem in the restoration of the ancient

piano. Because the design and structure of the piano have been improving and changing, and the ancient piano has a long history, it is difficult to find a perfect match among the existing parts. The piano was restored to playable condition.

According to the learning content of piano tuning and restoration major in colleges and universities and the actual learning situation of students, I want to study the lesson plan of setting up Design Technology Course, and through practice, explore whether the opening of this course can promote students' professional learning and professional ability development.

### **Piano tuning teaching**

In the course of piano tuning teaching, through continuous practice and communication with students, some important basic skills and improving skills were discovered in the process of improving the method of piano tuning practice. The author believes that the most common factor affecting piano tuning is the time factor, which largely affects the average time a student spends on each peg. Students are required to precisely control the operation time to about ten seconds to ensure that the overall tuning of the piano can be completed within one hour. In order to ensure the efficiency and correctness of piano tuning, teachers need to subtly emphasize the role of time to students in the usual teaching process. In the test and practice, the professional ability of the students is also inspected in various stages to help students learn piano tuning better (Zhao, 2020).

"The development of the industry urgently needs high-quality, high-skilled, and applied craftsmen from great countries in the new era." Qi Lihua, an associate professor at the School of Music of Jinan University, has conducted research on the current situation of the construction of piano tuning majors in colleges and universities in my country. Piano tuning, adjustment, repair theory and technology, skilled piano tuning technology and scientific management ability, engaged in piano tuning technology teaching and research, piano sales and other work in art colleges, piano production and sales companies' manager. The integration and development of professional education and innovation and entrepreneurship, with the goal of professional quality and innovation awareness, is the trend to cultivate more comprehensive talents with professional skills and comprehensive qualities (Lu, 2023).

Zheng Huaijie (2017) believes that although my country's piano tuning professional education has begun to take shape, it is still a new discipline compared with other disciplines under the category of musicology. Its teaching system has not yet been formed, and the teaching team is not mature enough. insufficient. In the long run, the talent training plan and mechanism have not really formed. Looking back at the status quo of piano manufacturing enterprises, capital, technology, and equipment have been greatly improved, and product quality has been improved. However, in the process of rapid development, many problems have also emerged: the mobility of piano manufacturing technicians has increased, and a large number of migrant workers have entered the piano production line. Problems such as the low musical professionalism of employees and the shortage of technical personnel directly affect the further improvement of the innovation ability and product quality of my country's piano manufacturing. China's piano products lack competitiveness in the international market. It has become an inevitable choice for the scientific and sustainable development of the piano manufacturing industry to strengthen the combination of technological innovation and personnel training, and encourage qualified colleges and universities to cooperate with piano

production enterprises with technical strength to cultivate piano production technical personnel.

The tuning and adjustment of the piano refers to the perfect combination of art and technology, which can fully adjust the sound quality, pitch and touch of the piano to further meet the relevant requirements of performance. In colleges and universities, there are generally piano tuning majors and musical instrument repair majors, and some piano tuning commercial organizations and training schools have also emerged as the times require, and the piano tuning major has shown unprecedented vitality. Whether they graduated from a university specializing in tuning or have received relatively short-term training in piano factories or training institutions. Regardless of whether you have been in the industry for a long time or you are new to the industry, there is a serious problem, that is, the unevenness of tuning skills and professionalism. In the actual process of playing the piano, we must pay attention to some practical problems in piano performance and solve them in time (Zhao, 2020).

According to statistics from the China Musical Instrument Association website, in 2011, the number of pianos in my country exceeded 5 million, and the volume of piano repair services increased rapidly. Each piano requires tuning and parts maintenance once or twice a year on average. The piano should be tuned and repaired no less than 4 times a year, and the professional piano should also be inspected, tuned and maintained in time during the rest period. However, there are less than 4,000 professional tuners in the country who have the qualifications of piano tuners, and there are only a few hundred senior piano tuners who can master both theoretical knowledge and technology. The market for piano tuners is in short supply (Xu, 2023).

As the king of musical instruments, the piano has always been the first choice for music lovers and music workers. Piano tuning is related to the quality and level of piano performance and piano teaching. If the accuracy of piano rhythm cannot be guaranteed, performers will not be able to show the charm of musical works, and teachers will not be able to accurately convey the emotions expressed in the works to students. The author briefly discusses the importance of piano tuning in piano performance and teaching, hoping to make more and more practitioners realize the importance of piano tuning (Wang, 2018).

The introduction of the modern apprenticeship system for piano tuning majors in higher vocational colleges can deepen the integration of production and education, is an effective way to achieve win-win cooperation between schools and enterprises, and is an effective carrier for the cultivation of modern vocational skills and professionalism. The author takes the interactive apprenticeship teaching mode of dual-tutor teaching and dual-subject education in the piano tuning major of Kaifeng Culture and Art Vocational College as an example, and explores and researches the teaching mode, curriculum system characteristics, and practical operation of the major (Wen, 2018).

With the development of social economy and the improvement of people's living standards, the popularity of pianos is getting higher and higher. However, due to the complexity of the piano structure and the variability of intonation, even if the piano is rarely used, professional tuning of the piano is required every year. . Therefore, the training of piano tuners has become inevitable. The author mainly combines his own teaching practice, starts with the connotation of piano tuning, and explains the necessity of the development of piano tuning lawyers (Li, 2014).

## **Lesson plan design in colleges and universities**

Teaching can reform the disadvantages of traditional teaching, avoid the fragmentation of Chinese teaching knowledge and the irreproducibility of Chinese thinking, and make traditional Chinese teaching on a more scientific and reasonable road, which is of great significance to the reform of basic education in our country. A good sample lesson plan design can not only reduce the teaching pressure of teachers, enrich the content and methods of classroom teaching, but also reduce the learning pressure of students, so that students' Chinese learning is more organized. Gain extra life experience, achieve the purpose of "teaching" for "not teaching" (Zhang, 2022).

Analyzing and researching the design of primary school Chinese lesson plans can provide a reference for the majority of primary school Chinese teachers, helping them clarify the common problems that can be felt but vague in the design of lesson plans, so that they can be sensitive to these common problems and consciously compare their own lesson plans, to avoid these problems in the process of designing lesson plans in the future. At the same time, reasonable lesson plan design can make the classroom unfold more orderly, because careful presupposition is the foundation and premise of creating a wonderful classroom, which can better guide teachers' classroom teaching and improve classroom teaching efficiency. Effectively help primary school students master basic knowledge, basic Chinese application ability and basic learning methods in the classroom teaching process, stimulate students' interest in Chinese learning, and better serve Chinese classroom teaching (Hu, 2021).

Teachers should design subject lesson plans before teaching, predict the possible reactions of students, and prepare for them. Reasonable arrangement of the application sequence of the lesson plan and the micro-class is conducive to improving the quality of teaching and laying a solid educational foundation for the realization of the training goal of core literacy. Based on this, in this article, the author mainly studies the strategy of effective integration of micro-lessons and tutorial plans in the design of subject lesson plans. Preparing corresponding teaching materials in combination with teaching objectives is only the first step in the combination of lesson plans and micro-lessons. Teachers also need to process these materials in combination with teaching needs to ensure the scientific nature of lesson plan design (Liu, 2022).

This teaching method is based on the theory of genre and genre analysis, emphasizing that students should understand the discourse structure and language characteristics of texts with different themes. At present, most scholars at home and abroad mainly apply genre-based teaching methods to foreign language reading and writing teaching, and there are few studies on integrating genre-based teaching methods into listening courses. The author makes up for this defect in the article, under the guidance of genre and genre analysis theory, taking the teaching of Listening and Speaking, the first unit of English Compulsory 2 in Senior One, as an example. Tried to design a high school English listening course lesson plan that incorporates the genre teaching method, and introduced the design content of the entire lesson plan in detail (Song, 2022).

The author proposes that design teaching should change from "learning by teaching" to "teaching by learning". In the lesson plan, there must not only be core elements such as content, organizational teaching methods and requirements, practice time, and frequency, but also basic elements such as the number of students, teaching difficulties, and exercise load presets. The analysis of teaching materials and learning conditions naturally leads to the key

points and difficulties of teaching. As for which student methods to effectively solve the key and difficult points, it is necessary to formulate targeted teaching strategies. It is recommended that teachers consider and reflect this in teaching design (Liu, 2022).

### **Teaching evaluation in colleges and universities**

As an important tool to test teaching effectiveness, teaching evaluation is an important link in the teaching of junior high school English courses. Scientific teaching evaluation is the basic guarantee for cultivating students' core literacy. However, the current evaluation of English teaching in junior high schools lacks emphasis on the subject of students, the content and methods of evaluation lack diversity, and the evaluation results lack comprehensiveness. Based on this, the author starts from the perspective of evaluation subject, method, standard and content, and aims at the problems existing in the evaluation of junior high school English teaching, and puts forward the implementation strategy of diversified teaching evaluation, in order to promote the high-quality development of junior high school English teaching. The implementation of diversified teaching evaluation has a good effect on the cultivation of students' English language ability, cultural awareness and other core qualities (Yang, 2023).

Classroom in colleges and universities is the main front and channel for teachers to carry out teaching activities and students to acquire knowledge and improve their abilities. Classroom teaching evaluation is an important part of teaching quality monitoring and the key to determining the quality of college education and teaching. At present, the objectives of classroom teaching evaluation in colleges and universities are not clear, the evaluation system is not scientific and reasonable, and the evaluation feedback and continuous follow-up are not timely, which affects and restricts the realization of the purpose of classroom teaching evaluation. In view of the existing problems, the author proposes to clarify the purpose of classroom teaching evaluation, and reconstructs the "student-centered" classroom teaching evaluation system, including classroom teaching evaluation index system and information feedback mechanism, in order to achieve an efficient classroom teaching evaluation system (Xu et al, 2023).

The evaluation of music education teaching is the evaluation of music teaching activities in colleges and universities. Its basic goal is to improve the quality of teaching and ensure the order of music teaching management. With the in-depth reform of the teaching mode in colleges and universities, the types and contents of music education teaching evaluation are more abundant. Classroom teaching is the basic form of school teaching, continuously improving the quality of classroom teaching is the key to cultivating qualified talents, and improving the classroom teaching evaluation index system is the basis for improving classroom teaching quality. Vocal music teaching is a professional skill course of music education major. Establishing a vocal music classroom teaching evaluation system that can promote the healthy development of its teachers and students can not only standardize the teaching order of vocal music teaching, but also improve the teaching quality in an all-round way (Chen, 2023).

The author analyzes the problems existing in the traditional teaching evaluation methods of the professional basic courses opened under the computer major, and at the same time fundamentally improves the teaching quality of the courses according to the requirements put forward by the Ministry of Education. Therefore, taking the "Data Structure" course as an example to analyze its disadvantages in the traditional single teaching evaluation method, and



re-evaluate the courses students have learned through the improved diversified teaching evaluation method. The teaching effect shows that this evaluation method not only enhances the students' self-consciousness and sense of mission, but also can motivate and give feedback to both students and teachers, further improving the quality of teaching and students' practical ability (Zhang et al., 2023).

## Conclusion

With the popularization of higher education and economic transformation in my country, the teaching reform of applied undergraduate colleges and the cultivation of applied talents have become one of the key topics of higher education. As an important link in the teaching activities of applied undergraduates, the fundamental purpose of teaching evaluation is to promote the professional development of teachers and improve the teaching quality at the same time. Based on the CNKI database, the author first analyzes the current research trends and major research institutions of applied undergraduate teaching evaluation. Then, a literature review is carried out from the aspects of the current concept of teaching evaluation in applied undergraduate colleges, teaching evaluation standards and index system, problems existing in teaching evaluation, and corresponding solutions.

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