

Analysis of the Current Situation of Piano Education in Colleges and Universities in the Information Age and Research on Countermeasures

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Abstract

In view of the low application ability of piano improvisational accompaniment of music majors, this paper proposes a method of big data combined with MIDI keyboard and Kinect depth sensor to achieve the purpose of recognizing chord progression and judging fingering when students perform, and realizes the auxiliary teaching system. Firstly, the information of color and depth images is obtained, and the state transition diagram of chord transposition and chord gesture template library are constructed as the system initialization conditions. Secondly, using the traditional skin color modeling and background difference method as well as the current depth data, the gesture recognition is realized by template matching. Finally, the correctness of chord progression is judged, and comprehensive fingering application is used to score and evaluate. The experimental results show that the system has high robustness and can be effectively applied to piano teaching.

Keywords: Signal Acquisition, Piano Teaching, Big Data, Chord Analysis

I. Introduction

With the rapid development of China's political, economic and cultural undertakings, the cause of art education is also improving. As one of the art education, piano has its unique advantages in improving students' intelligence and comprehensive quality [1-2]. Nowadays, with the popularization and development of piano in China, piano education is constantly accelerating the pace of reform and innovation of scientific research results.

Different from music colleges and universities, piano course as a compulsory skill course of music education major, rather than major, its teaching content and curriculum has also been widely valued. Piano teaching plays an extremely important role in music education and is the foundation of music education [3-4]. In recent years, although the reform of piano teaching in Colleges and universities in China has made great progress and development, there are still some problems in the process of students' learning and employment. For example, students think that playing piano is only a technical training, they do not have a deep understanding of the style of works, and they think that it is enough to complete the music left by teachers. The ability of using piano as a teaching tool in practice is relatively poor. After graduation, I don't know how to engage in basic music education and how to be a qualified piano teacher [5]. The existence of these problems has brought a lot of trouble for students to go to the society and face the actual teaching work.

At present, in the music major of colleges and universities across the country, piano teaching method has been listed as a top-quality course in more than ten colleges and universities. The perfect course construction and excellent teaching team have provided certain theoretical and practical basis for the construction and development of this course [6-7]. Although the opening of the course has made some achievements, we still need to constantly improve it. This paper will investigate the music education major in Colleges and universities in Guangxi, and plan to analyze the opening of the "piano teaching method" course through on-the-spot investigation, so as to improve the teachers' and students' understanding of the course and gradually improve the construction of the course.

II. A survey of piano teaching method

2.1 The development of piano teaching method in music education in Colleges and Universities

"Piano teaching method" is different from the general piano class, is a strong professional discipline. Piano class is mainly to teach the way of piano playing, piano playing skills training practical operation class. The "piano teaching method" not only studies the various technical methods of piano teaching itself, explores the general rules of teaching, but also involves psychology, pedagogy and many other related disciplines. It is a basic course integrating skill and practicality in music teaching in normal universities. Piano is an important teaching tool for music teaching [8]. It also shows that good piano playing skills and perfect theoretical knowledge are the necessary ability to deal with the problems in the actual teaching. The course of "piano teaching method" has a direct relationship with piano teaching and the cultivation of teachers for basic education.

In the early 1980s, Professor Ying Shizhen compiled the book "piano teaching method", which was used as the teaching material. The course of piano teaching method was first set up in the Central Conservatory of music. The object of the course is the students of piano major. The teaching content is mainly aimed at how to solve our technical problems in the process of piano practice, how to grasp the music style and some regular problems in teaching. As an important course of piano major in the Central Conservatory of music, this course has been followed to this day. Piano skills course is very important for students. At the same time, the study of piano theory course can promote the training of students' skills, help students develop their thinking, improve their teaching ability, and also have a far-reaching impact on the basic music education of the whole nation.

In order to realize the future oriented talent education mode, at present, the education of colleges and universities is also to improve the comprehensive quality of students as the core, to cultivate students as the focus, to build a comprehensive and systematic comprehensive theoretical knowledge structure and professional skills of students. The establishment of "piano teaching method" can not only improve the technical knowledge of normal students' Piano theory and practice, but also enable them to learn how to be a qualified piano teacher in the future and have the ability of independent piano teaching. It will lay a solid foundation for the future music basic education [9-10]. Therefore, it is necessary for music education majors in Colleges and universities to pay enough attention to this course and conduct in-depth teaching discussion.

2.2 Course introduction

1. Course nature

Piano teaching method analyzes the content, process, principle and method of bilateral activities between teachers and students in piano teaching. To study the common problems in piano teaching and summarize the characteristics and rules of piano teaching activities, we should not only study various performance techniques involved in piano teaching, explore the teaching methods and training rules, but also involve psychology, pedagogy and many other disciplines. It is a theoretical course to study piano teaching that emphasizes the theory, guidance and practicality.

2. Course objectives

The goal of the course is to systematically sort out and classify the contents of various parts of piano teaching, and find out the universal characteristics and laws. So that students can clearly understand the style characteristics of piano art in each historical period and how to master these characteristics in teaching, and correctly understand the basic teaching steps of various basic playing techniques in the piano teaching of junior and intermediate level. It can accurately express the essentials of various basic techniques in language, so that students can understand the reasonable use of various teaching materials, the playing rules and teaching points of various specific teaching materials. So that the students who are engaged in basic music education in the future can become music teachers who not only master the basic knowledge of piano playing, but also have certain piano teaching ability.

3. Curriculum design

"Piano teaching method" is listed as a professional elective course in the Ministry of education's "national undergraduate professional curriculum guidance plan for musicology teacher education in ordinary colleges and universities". There are no clear provisions on the arrangement of class hours and credits, but leave room for the

majority of colleges and universities to adjust. Therefore, colleges and universities can increase class hours and credits according to the actual situation and teaching characteristics of their own regions and departments. Music education major of Guangxi Normal University will open it as an elective course for one semester, with a total of class hours.

4. Course content

The teaching content of the course mainly focuses on the procedural problems in piano teaching and the main topics in piano teaching. It includes the development of piano music, the training principles and methods of piano performance psychology, the deduction of different music styles, the stage of piano teaching and the organization and implementation of teaching methods. In addition, different schools can appropriately increase the teaching content with regional characteristics according to their own regional characteristics and school running characteristics.

III. Investigation and Analysis on the current situation of piano teaching method in Guangxi Universities

3.1 Current situation investigation

1. The making of interview outline

The interview outline is designed for piano teachers in Colleges and universities in Guangxi and music educators in primary and secondary schools, kindergartens and training schools. It is expected that through the answers of professional teachers, we can have a more detailed understanding of the current situation of the "piano teaching method" course of music education major in Colleges and universities in Guangxi, so as to provide future teachers with teaching exchange and help. In order to know more about the opening of "piano teaching method" course for music education major in Colleges and universities, the questionnaire was given to students and the piano teachers were interviewed at the same time. Through the research and analysis of literature, the outline of teachers' interview was formed, which involved four directions and 13 branch problems. The question mainly designs the interview question from the following four aspects: the opening of piano teaching method course, the setting of the course, the teachers' teaching attitude and the students' learning situation.

2. Making of questionnaire

The questionnaire consists of 22 multiple-choice questions and one open-ended question. The multiple-choice questions are divided into two parts, i.e. having taken this course or not. The main purpose of the questionnaire is to obtain the current situation of the piano teaching method course for music education majors in Colleges and universities. The problems include students' understanding of the course, teachers' teaching methods, students' learning attitude, and the future development of the course. In addition, an open-ended question is designed: what do you want to learn from this course? Through the students' real answers, it is concluded that students pay more attention to the teaching of "piano teaching method" in their subjective consciousness.

3. Selection of research objects

Guangxi is located in the economically underdeveloped provinces, and the conditions for running schools are relatively lacking. According to the regional characteristics, this paper selects six representative colleges and universities in this region. Six colleges and universities are located in southern and Northern Guangxi, including one comprehensive university (Guangxi University), one fan college, one professional art college (Guangxi Art College), and four normal colleges and universities (Guangxi Normal University, Guangxi Normal Liuzhou normal college, Guilin normal college, etc.).

3.2 Current situation analysis

After the communication with eight piano teachers in Colleges and universities, we found that the teachers gave a unanimous affirmative answer to the course. The main point of view is: piano is an important teaching tool for students to engage in music teaching in the future, and this course is an important theoretical course to help them

improve their playing skills and be competent for the future teaching work, which will undoubtedly play an important role for students to enter the work. This concept makes every teacher consciously infiltrate the piano teaching methods in the piano skill teaching, and some teachers also have their own unique ideas in the teaching or curriculum construction. Such as this kind of assumption, several teachers from other colleges also have different ideas, and this visit can also reflect the teachers' good teaching attitude. They continue to explore piano teaching through practice, carry out academic research, and establish quality courses, which have laid a good foundation for students' future learning.

The imbalance of teachers in these schools has brought great obstacles to teachers' teaching and scientific research activities, which is also an important problem in this survey. There are 52 piano teachers in six colleges, including 7 professors, 11 associate professors, 31 lecturers and 3 teaching assistants (as shown in the figure below)

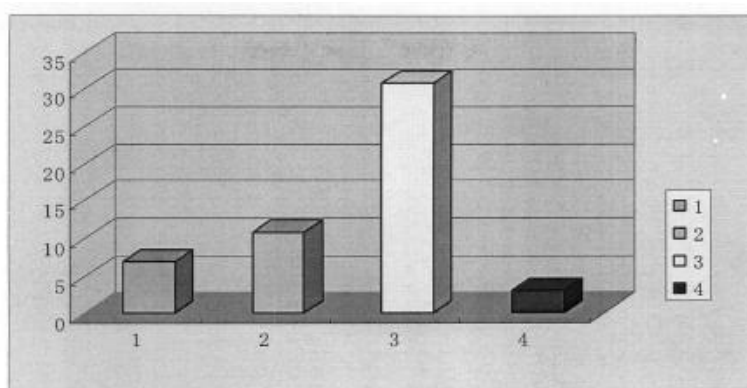


Fig 1: Distribution map of teachers

According to the data, the proportion of lecturers accounts for the majority, while some colleges and universities do not have piano professors at present. The imbalance of teaching staff leads to the obstruction of course opening and the lag of scientific research achievements. These problems have a certain impact on the construction and teaching effect of "piano teaching method" curriculum system. Fig. 2 is a part of the chord state transition diagram.

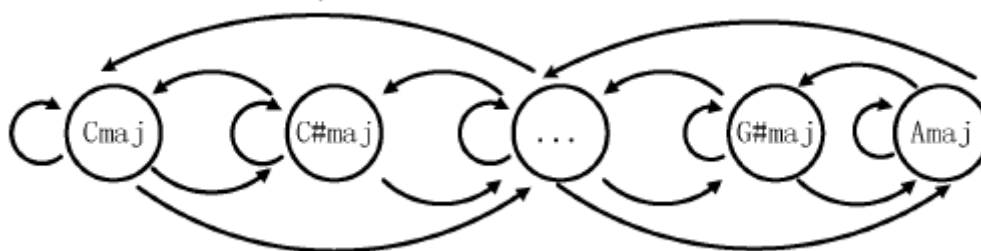


Fig 2: Distribution map of teachers

3.3 Main problems

Through the data analysis of the above interviews and questionnaires, we can see that the problems affecting the teaching of piano teaching method in Guangxi are mainly reflected in the following aspects:

1. There are some disadvantages in the construction of piano theory curriculum system

At present, the piano theory curriculum system of most colleges and universities in Guangxi is not perfect. The importance of piano teaching in music education specialty is only reflected in the cultivation of skills. How much

effect will theoretical knowledge bring to professional skills and future teaching? It seems that this point has not attracted enough attention of the school. Although some colleges and universities also offer piano theory courses, most of them focus on traditional skills training, not involving the teaching of piano teaching methods, and lack of the cultivation of students' teaching ability. In teaching, too much attention is paid to the training of performance skills, and the connection between theoretical knowledge and practical teaching is ignored; Curriculum, teaching content and teaching methods are not reasonably planned, so that the training can not achieve the national goal, and can not meet the needs of the society for piano teachers, it is not the purpose of normal education training. This kind of training mode is worthy of careful consideration in Colleges and universities.

2. Piano teacher training needs to be improved

The proportion of young and middle-aged piano teachers in six colleges is too high, teachers are not balanced, and teachers' teaching ability and material research ability are relatively weak. From the current situation, most of the young teachers directly enter the work post after graduation from professional colleges, and all have good professional performance level. Due to the lack of teaching experience in traditional piano teaching, teachers are unable to cultivate students' teaching ability. Often, after a semester, they only teach students how to play a few pieces of music. In addition, the expansion of colleges and universities leads to the lack of teachers, teachers need to work overload to complete the teaching of students, also makes it difficult to carry out the reform of piano teaching and scientific research activities of music education major in Colleges and universities, all kinds of situations increase the difficulty of training qualified piano teachers in the future.

IV. On the course construction of "piano teaching method"

While discussing how to become a qualified music teacher and piano teacher, we need to constantly strengthen and improve our curriculum, improve teachers' teaching quality, cultivate students' comprehensive ability, and make up for the shortcomings of the original music education in normal universities. Through the investigation and research of music education major in six colleges and universities in Guangxi, this paper thinks about the existing problems, and expects to provide some help for the establishment of "piano teaching method" in Guangxi in the future. Table 1 is a part of the sorted chord standard library.

Table 1 Chord comparison table in JFugue

Chord names in JFugue	Note	Digital representation
maj	C,E,G	0,4,7
min	C,D#,G	0,3,7
aug	C,E,G#	0,4,8
dim	C,D#,F#	0,3,6
dom7	C,E,G,A#	0,4,7,10

4.1 Improve the curriculum

"Curriculum is the intermediary bridge for the school to cultivate talents and realize the educational purpose". The construction and development of curriculum is an important part of improving the overall quality of students. It can be said that it is a key factor in the process of teaching reform. School education departments are more and more aware that a reasonable and perfect curriculum is not only the basic guarantee to help students obtain high academic level and learning effect, but also the basic guarantee for the success of school curriculum and teaching reform. Piano as a basic course of music education, whether it has a perfect curriculum system, excellent teacher team has become the key factor of the success of the reform. In recent years, China's basic education reform is in full swing. The opening of new courses has brought unprecedented challenges to teachers' teaching. Piano teaching of music education major should not be limited to the training of skills, but also pay attention to the cultivation of

teaching ability. Through the investigation, it is found that although some colleges and universities in Guangxi have set up or have set up this course, they lack the overall planning of the course, and there is no perfect curriculum, so many students gain little in the learning process and the end of the class. Therefore, after serious consideration, we first propose to improve the curriculum.

4.2 Improving teachers' teaching quality

Teachers are an important variable in the teaching process, and their position is self-evident. With the rapid development of China's education, the pace of the construction of teachers' specialization is also accelerating. In order to improve the quality of education, the improvement of teachers' quality also has a new orientation. Through the investigation, it is found that the teaching effect of some school teachers is not ideal due to their weak professional theoretical knowledge, insufficient accumulation of practical teaching experience or improper teaching methods. Therefore, this paper puts forward the following suggestions to improve the teaching quality of teachers:

1. The change of piano teaching concept

Today, with the rapid development of economy and culture, it is doomed that teachers cannot impart all knowledge to students. Therefore, modern education is to let students develop good learning habits, master scientific learning methods, and constantly acquire knowledge to enrich and improve themselves“ Sukhomlinsky, a famous education practitioner and theorist in the Soviet Union, once said in "suggestions for teachers": "only education that can stimulate students to carry out self-education is real education." This puts forward higher requirements for Piano Teachers' Teaching: change the traditional teaching mode that attaches importance to piano skill training, improve students' desire for autonomous learning, and strengthen the cultivation of students' teaching ability.

2. The perfection of piano theory knowledge

"Piano teaching is a relatively independent discipline in music education, and it is also the basic discipline of many other brother disciplines. Piano teaching has its own rules and characteristics." The development of piano has a history of nearly 300 years, during which the teaching theory has been established“ In teaching, it is not enough to play the piano in a narrow sense, but to rely on comprehensive knowledge. " This includes the historical development of piano, appreciation of piano works, art of piano performance, piano teaching method and so on. If you want to be a qualified piano teacher, you must first try to be familiar with and study the historical, modern, foreign, domestic and the latest piano teaching theories to guide your own teaching practice. Wrong teaching will accompany students' life and even affect the future basic education. Secondly, the cultural knowledge related to the subject can also open up students' thinking, so that students can learn the subject by analogy and improve their comprehensive ability. In the process of background difference, the average background method is used to model the upper left of Fig. 3, and the average value of each pixel in the first 20 frames of image is calculated as its background model, and the gray difference between foreground and background is used to achieve the purpose of difference.

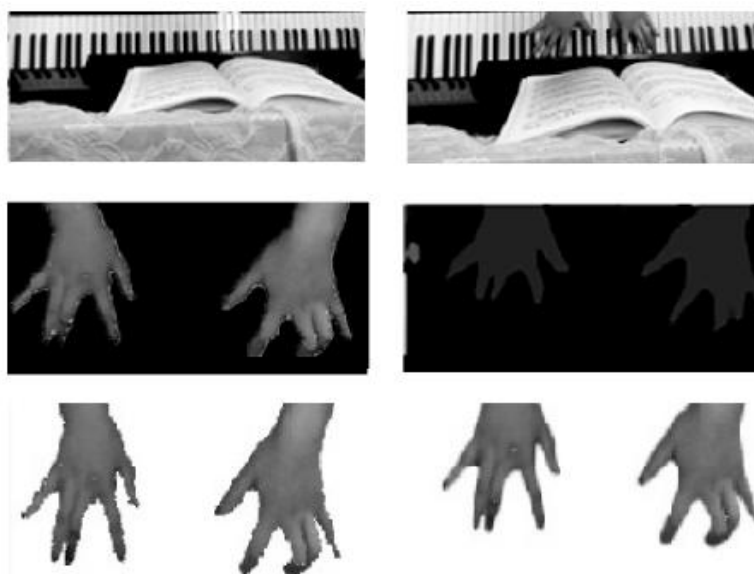


Figure 3 Image segmentation based on depth and color information

3. The improvement of piano teaching skills

Proficient professional skills is an important guarantee for the smooth progress of teaching work and the improvement of teaching efficiency. Similarly, good teaching ability is one of the basic standards to measure a qualified teacher, which is worthy of teachers' attention and needs to be improved. Piano teaching skill quality is the basic quality that a piano teacher must have, otherwise he will not be able to complete the practical work of piano teaching. These basic qualities can be summarized into six aspects: the ability to organize teaching, the ability to use teaching materials, the ability to express language, the ability to demonstrate performance, the ability to teach students in accordance with their aptitude, and the ability to enlighten students' thinking. "

(1) The ability to organize teaching: first. In teaching, teachers should sum up the knowledge points in order to impart them to the students. It has a direct impact on the teaching effect to appropriately transform the summarized experience and cases into a way of expression suitable for the students' understanding. Second, it is one of the main signs of teachers' ability to teach and solve doubts. According to the reports of Spaulding (R.1963) and Rosenshine (B.1971), the systematization and systematization of teachers in teaching are positively related to students' academic performance. "Teachers who are good at guiding students to ask questions and solve problems through thinking also teach students the ability of independent thinking. Third, teachers should have "teaching wisdom", which is also a rare ability of most teachers. This "teaching wisdom" covers many aspects, such as teachers should maintain a certain artistic passion in class, be able to have a keen insight into the changes of students' thinking, adjust the teaching methods according to the actual situation, and so on.

(2) the ability to use textbooks: the proper use of textbooks will also achieve twice the result with half the effort. Teachers should constantly strengthen their analytical ability be learned in books while absorbing the essence of their teaching.

(3) The ability of language expression: as a piano teacher, the professional technical skills mentioned here not only refer to having good playing skills, but also emphasize that teachers can clearly explain the solution of technical problems in teaching. Many young teachers have just left the campus to work, so there will not be much difference in piano playing technology. However, the language expression to solve the technical problems is a little insufficient, which will lead to the situation of "poor words". What they want to express often can not be realized in language, resulting in students "confused" about the problem.

(4) Demonstration performance ability: situ bichun believes that "as a piano teacher, only by constantly improving his performance level, can he better demonstrate for students, continuously broaden the teaching repertoire, and further study the teaching materials, which is self-evident." Demonstration can make students directly perceive the content of the teacher's explanation by observing the main points of the teacher's action, and also guide students to cultivate the ability of observation and appreciation by observing and appreciating the teacher's demonstration.

(5) Ability to teach students in accordance with their aptitude: Ying Shizhen mentioned the problem of "one key to open one lock" in his book piano teaching method. He said: "there are different types of students, piano teachers must analyze them, according to the different characteristics of students, age, personality, according to their different problems in different periods, teach students in accordance with their aptitude, develop their strengths and make up for their weaknesses." Students' differences lead to teachers' teaching can not be stereotyped, in the training of qualified music teachers at the same time to give them enough space for development, individualized teaching, targeted to take corresponding measures, in order to achieve better teaching effect.

(6) Enlightening students' thinking ability: "teaching is not to simply instill truth into students, but more importantly to guide students to explore and discover truth" Many teachers will adopt cramming teaching for several years, ignoring the guidance of students to ask for advice from books. Teachers should change this concept, take the "teacher teaching" into "student learning" autonomous learning ability, learn from the experience and lessons of predecessors. This kind of learning process and impression is extremely profound and most effective. If you want to do this better, teachers must improve their own ability, integrate the accumulated knowledge and experience, improve the ability to analyze and solve problems, so as to encourage students' all-round development, broaden their horizons of knowledge, and improve students' all-round cultivation.

The improvement of these qualities is closely related to the teaching effect of the course. The change of teachers' concept and the improvement of teaching quality are the effective guarantee to realize the teaching purpose. For a qualified teacher, to be able to convey this attitude to every student will also make students love this course more and pay more attention to it.

V. Conclusion

Since the birth of piano, piano teaching and piano performance have been developing together. With the continuous exploration and practice of teachers and students, piano teaching has made great progress. The current situation of piano teaching in China has also made gratifying achievements, but piano education in normal universities sometimes always follows the teaching mode of professional art colleges, and the effect is not good. Guangxi is located in the economically underdeveloped areas, and there is a big gap in the level of education compared with the economically developed areas. In recent years, the music education major in Colleges and universities in Guangxi has made some achievements with the strong support of the state, the government and the leading departments at all levels, but we must also see the existing problems.

In the process of investigation, limited by objective conditions, the research only focused on the actual situation of the region, and the scope of the research was still narrow. Because of the limited level of the researchers themselves, there are still many vague points in the research on the course construction of "piano teaching method" for Musicology Major, and there are also many discussions that can not be carried out. These problems need to be further studied and discussed according to the actual situation of teaching in various colleges and universities. Through the research of this paper, it is expected that the future students can not only master the systematic and complete piano playing, but also gradually strengthen their own basic theoretical knowledge through the study of "piano teaching method" course, and finally achieve the mastery of knowledge and be competent for the work of music basic education and Piano teacher.

References

- [1] Jin Xiaodan. Emotional Teaching in Piano Teaching of Preschool Education Major. *Preschool Education Research*, 2005, 4: 52-53
- [2] Wang Yi. Research on the Development of Piano Teaching Mode in the New Media Era. *Education Research*, 2020, 3 (6): 54-59
- [3] Lai Shuie. Research on the Construction of Piano Teaching Curriculum for Preschool Education Majors in Normal Universities. *Art 100*, 2011 (03): 260-262
- [4] Wan Ying. Analysis of Beethoven's Music in Piano Teaching -- a Review of Beethoven's Piano Sonata Research. *Higher Education Exploration*, 2018, 12: 5-10
- [5] Wang Jiutong. Foreign Reference of Piano Teaching Theory in Chinese Universities Since the New Century. *Music Research*, 2011 (6): 93-104
- [6] Wang Xiaokun. Piano Teaching Reform of Music Major in Normal Universities Under the Guidance of New Curriculum Concept. *Chinese Musicology*, 2004 (3): 101-102
- [7] Guo Art. Analysis of the Important Role of Innovative Thinking and Teacher-student Interaction in Piano Teaching. *China Education Journal*, 2015 (s2): 66-73
- [8] Wan Ying. Analysis of Beethoven Music in Piano Teaching -- a Review of Beethoven's Piano Sonata Research. *Higher Education Exploration*, 2018, 188 (12): 135
- [9] Tong Shi Liu. Discussion on Piano Teaching Mode in Normal Universities Under the Guidance of Modern Education Concept. *Art Hundred*, 2008 (02): 208-211
- [10] Lin Lu. An Analysis of the Importance of Rhythm Factors of Minority Music Works in Piano Teaching. *Ethnic Education Research*, 2014, 025 (005): 133-139