

Research on the development and measures of Music Education students in the information Age based on TPACK framework

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Abstract. Under the background of the information age, the organic integration of information technology and music curriculum can not only improve the education model of traditional music majors, but also comprehensively interpret the concept of music teaching based on advanced technological means. At present, the education model with TPACK framework as the core can give full play to students' autonomy in learning and exploring, and comprehensively improve the professionalism of music education. Therefore, how to create a music teaching framework based on TPACK framework in the information age and promote the all-round development of professional students is the main problem of innovation and exploration in the field of education at present. In this paper, after understanding the development trends of the information technology and framework of our country, according to the analysis of the music subject development with the core of the TPACK framework, we mainly explore how to use the framework to improve the comprehensive ability of the students of music education major.

Keywords: Information age; TPACK framework; Music education; Major students; Disciplinary development.

1. Introduction

Under the background of extensive application of advanced technologies such as artificial intelligence, big data and cloud computing, the development of educational informatization has entered the 2.0 era from the 1.0 era. In order to fully implement the basic concept of "Internet + education", the education department, on the basis of integrating the accumulated experience of previous education, began to explore the education system with TPACK framework as the core. The final practice results prove that information technology has a positive impact on education reform and development. However, from the current status of education reform and development in colleges and universities, the information technology that has been mastered does not meet the needs of modern education. This is because teachers' educational innovation ability is not strong, and the degree of integration of information technology and subject education is not high, which directly affects the learning and exploration effect of professional students. The theory of TPACK framework was put forward by Schulman, an American educational research expert, in the mid-1980s. In 2005, Kohler and Mishra added technical elements on the basis of the original framework, thus formally putting forward the technical framework of the deep integration of information technology and subject teaching knowledge. The framework has been transformed from the original subject knowledge, teaching method knowledge and subject teaching knowledge into the content shown in Figure 1 below:[1-3]

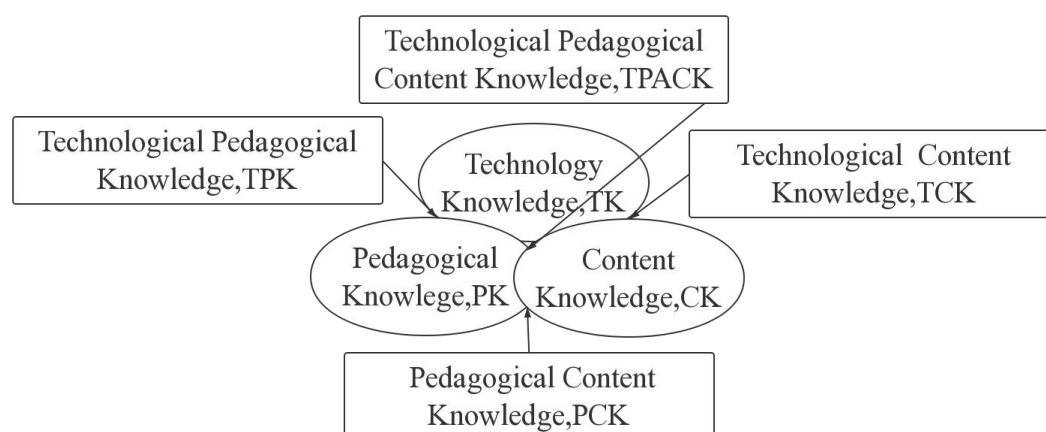


Figure 1 Knowledge structure of the TPACK framework

Through the review of the existing literature at home and abroad, it can be seen that the current research on TPACK framework has made rich achievements. The specific research directions are mainly reflected in the following aspects: First, increase the student-subject research closely related to teacher TPACK. Through rational application of educational information technology to optimize the existing classroom teaching mode, students can be guided to correctly understand and understand the content of knowledge representation. Nowadays, there are few research topics about student subjects. For example, some scholars regard TPACK framework theory as the basis and focus on improving students' ability of chemistry triple representation after creating the teaching strategy of chemistry triple representation with this as the core. According to the physiological characteristics and cognitive rules of students, some scholars mainly studied the influence of teachers' TPACK level on the composition of student groups, actively explored the path to promote students' knowledge learning and effective internalization, and provided an effective basis for promoting the development of education informatization. Secondly, the author attaches importance to the basic connotation of TPACK, the framework of educational context research. Context was first applied to the TPACK framework by Mishra. It refers to the micro and macro influencing factors contained in teaching activities composed of teachers and students. For example, age characteristics, learning atmosphere and physical environment belong to micro factors, while educational region, educational environment and educational policy belong to macro factors. Since this content plays an important role in the development of TPACK framework, scholars at home and abroad have increased their research efforts on it. Finally, based on the characteristics of Chinese education local research. China's curriculum reform should develop steadily towards the direction of modernization and informatization with Chinese characteristics. Therefore, on the basis of learning from the relevant foreign theoretical achievements, the domestic TPACK framework research will be designed and analyzed according to the current educational background and the basic characteristics of local teachers, and finally meet the needs of China's modern education reform and development. Therefore, after understanding the application advantages of TPACK framework and the demands of music education in the information age, this paper mainly explores the professional architecture of music education based on TPACK framework and focuses on analyzing how to cultivate outstanding student talents, so as to achieve the expected educational goals and guide the comprehensive innovative development of professional students.[4-6]

2. Method

2.1 TPACK Conceptual framework

Based on the analysis of TPACK conceptual framework shown in Figure 2 below, it can be seen that the dynamic relationship between technology, teaching method and subject teaching content is

mainly used to understand the changing nature of knowledge structure when teachers integrate technology into subject teaching. Therefore, professional teachers are required to fully master subject knowledge and continuously optimize their integration ability.[7-9]

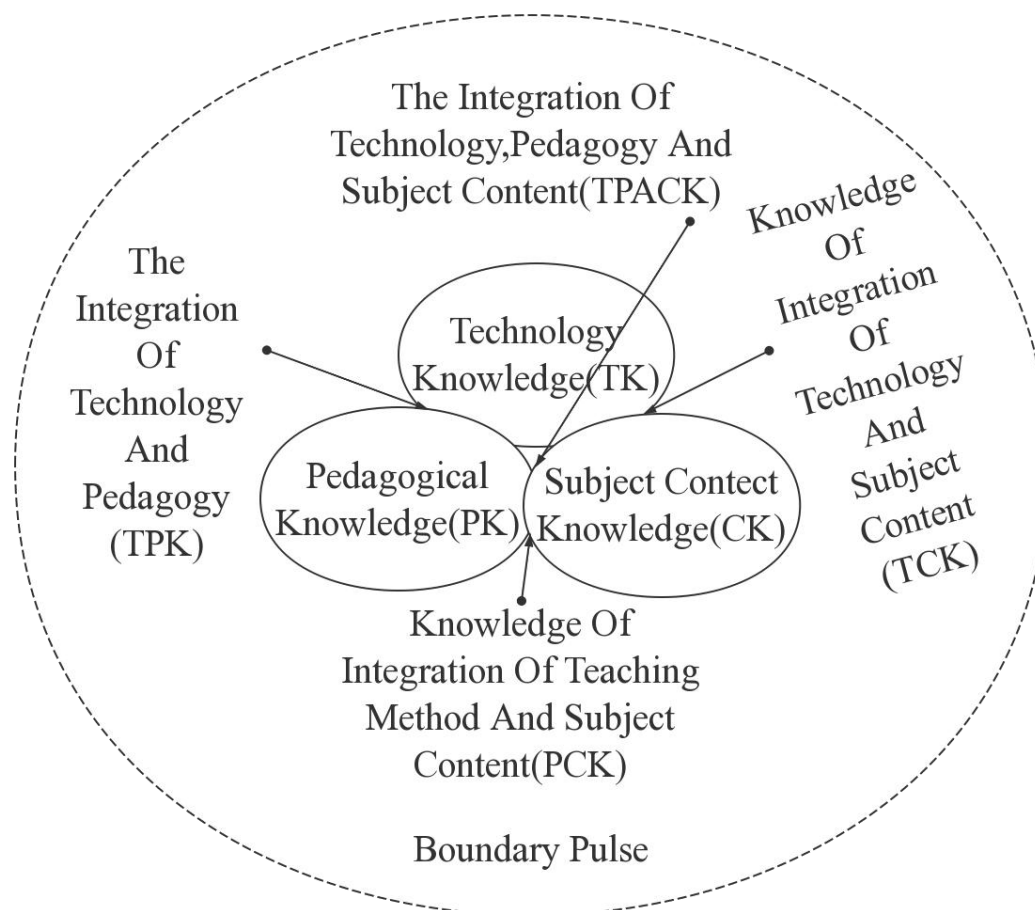


Figure 2 TPACK Conceptual framework structure diagram

2.2 Science development of music based on TPACK framework

In essence, music education is a form of education based on perceptual knowledge, which is quite different from the subject education based on rational knowledge. Both knowledge learning and concept comprehension have the characteristics of personalized experience. Therefore, rational use of information technology can better express music knowledge. Therefore, at present, researchers propose to use TPACK framework to build a framework of music knowledge with music teacher integration technology as the core, which can not only transform the traditional education model, but also speed up the reform of music education. The specific structure is shown in Figure 3 below:

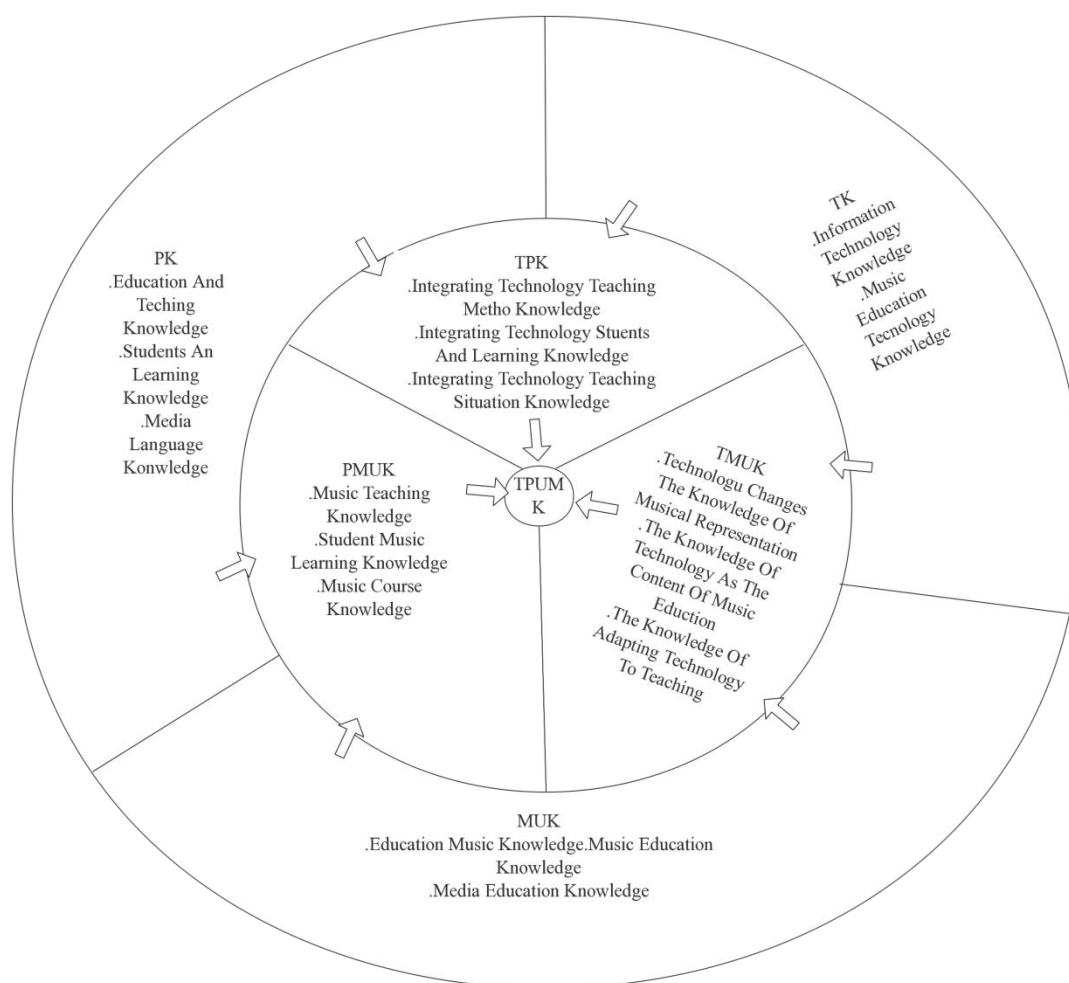


Figure 3. Music science architecture diagram based on TPACK conceptual framework

Based on the analysis of the figure above, it can be seen that TRUMK, as a music professional education model based on TPACK framework, not only contains three basic elements: technical knowledge, teaching method knowledge, and music subject content knowledge, but also has the content integrated among them. For example, the knowledge of music teaching method includes music teaching knowledge, students' music learning knowledge, and music course knowledge. The music knowledge of integrated technology includes the knowledge that technology changes music representation, the knowledge that technology ADAPTS to teaching, and the knowledge that technology is the content of music education. The knowledge of integrated technology teaching method includes the content of integrated technology students, learning knowledge, teaching situation knowledge and so on.[10-13]

2.3 Teaching Strategy

At present, there are few studies on music subject education with TPACK framework as the core. Therefore, after mastering the current situation of music education and the basic concepts of the framework, the education field should actively cultivate excellent teacher talents to ensure that they can fully understand and master the means of information technology and organically integrate information technology and music courses, so as to improve the effect of practical education. From the perspective of the information age, the teaching countermeasures of music education majors with TPACK framework as the core are mainly reflected in the following points:

First, give full play to the leading role of information technology. The organic integration of music teaching and information technology can fully present vivid teaching pictures, change the traditional education model based on tapes and pictures, and immerse students in a richer and more interesting teaching environment. In order to fully demonstrate the leading role of information

technology in music teaching integration, teachers should use educational resources and subject materials to transform the traditional static teaching mode into dynamic activities with visual images. For example, some teachers use music production software and intelligent automatic accompaniment software to randomly match different styles of harmony to a certain melody, which can not only arouse students' interest in learning. It can also lead them to experience different musical colors.

Secondly, improve the integration of various elements. Music education with TPACK framework as the core is closer to music content and teaching methods. Therefore, the development of TPACK framework on music subject should use the knowledge elements mastered to build new practical knowledge. It not only has the unique style of music teaching for teachers, but also can guarantee students to gradually deepen relevant content through teaching design and teaching guidance. In this process, teachers will encourage and support students to create their own music, gradually establish their own music library, share the song fragments with other peers and teachers, and eventually gradually form a creative style with their own characteristics.

Finally, give full play to the autonomy of students' cognition and understanding. At present, the academic research on TPACK framework mainly focuses on the teaching process of teachers using information technology during education, ignoring the learning process of students using information technology to comprehend knowledge. As an effective basis for understanding and applying music knowledge, both teachers and students can use electronic media language and network media language to form music itself. Therefore, information technology has gradually become an important content of modern music teaching. Teachers should actively cultivate students' ability awareness of acquiring, analyzing and utilizing information technology. Lay a good foundation for future study and development.

3. Result analysis

After mastering the technical framework and application countermeasures of TPACK in the information age, a questionnaire is designed to study the English education situation of in-service teachers and professional students in a university. The questionnaire is mainly divided into four parts: the first is basic information, the second is application consciousness, the third is application attitude, and the last is scale. The overall study included seven dimensions and representative multiple questions. According to Likert scale design principles, the question options included strongly agree, agree, uncertain, disagree, strongly disagree, and the score continued to decline in this order. The higher the score, the stronger the ability. A total of 250 questionnaires were collected in this questionnaire survey, and 249 qualified samples were obtained after invalid questionnaires were removed. Statistical software was used to organize and analyze the data. The reliability analysis results of the questionnaires are shown in Table 1 below:

Table 1 Reliability analysis of the questionnaire

dimension	Number of items	reliability
CK	2	0.520
PK	4	0.892
TK	3	0.804
PCK	3	0.868
TCK	3	0.841
TPK	4	0.896
TPACK	4	0.907
overall	23	0.924

Based on the data analysis in the table above, it can be seen that the reliability coefficient of this questionnaire survey is 0.924, exceeding 0.9, which proves that the data information obtained in this study is of high quality. At the same time, KMO test and Bartlett test were used for validity

verification, mainly to judge whether the research items were reasonable and meaningful. Specifically, as shown in Table 2 below, KMO value reached 0.907, which proved that the research data had good validity.

Table 2 Analysis of KMO and Bartlett test results

project		numerical value
KMO value		0.907
Bartlett Sphericity test	Approximate chi-square	1410.010
	df	21
	p value	0

Based on the above analysis, it can be seen that after entering the information age, how to cultivate outstanding talents with lifelong learning ability and creative thinking ability is the focus of social construction and development. Therefore, the organic combination of information technology and subject curriculum is the inevitable trend of the current subject education reform. Especially for music education majors, the rational use of information technology means can not only create new music forms and teaching concepts, gradually change from one-way visual teaching mode to remote interactive education mode, but also create high-quality classroom environment for professional students, enrich the presentation of teaching content and inject new development vitality for music teaching reform. Therefore, Chinese education should continue to integrate and explore information technology and music courses, pay attention to the combination of music subject characteristics, create an education system with KMO test and Bartlett framework as the core, truly realize the development goals of music subject innovation, and facilitate students to understand and use music knowledge and information technology. At the same time, local colleges and universities should organize music teachers to participate in information technology training activities at home and abroad, and pay attention to giving full play to students' autonomy in learning and exploring, so as to solve various problems faced by traditional education.[14-15]

4. Conclusion

To sum up, under the background of modern educational innovation, traditional music teaching model has been unable to meet the educational needs of teachers and students. People pay more attention to the organic combination of information technology and music teaching ability cultivation, and therefore put forward relevant research topics. By placing music knowledge in a variety of activity situations and allowing teachers to organize experiential learning activities by using information technology, it can not only improve the comprehensive ability of music teachers, but also facilitate students to understand and apply the knowledge theory. Therefore, how to fully apply TPACK framework technology and application theory to the cultivation of music teaching ability? At present, it is the main problem that music education discipline actively discusses.

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