APPLICATION RESEARCH THROUGH FEYNMAN'S LEARNING METHOD ON THE MUSIC INSTRUCTION OF STUDENTS COLLEGES, CHINA

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ABSTRACT
La The objectives of this study were to 1) To study knowledge level by Feynman's learning method in the music instruction of college. 2) To study the feasibility by Using Feynman's Learning Method in The Music instruction of college students. The sample size of 286 was determined with Taro Yamane table. This survey has two parts, the questionnaire and interview survey, and teaching process. Research Instruments includes 1) The Chinese and English questionnaires of "Questionnaire on the Use of Feynman Learning Method". 2) Teaching plans combined with the principles of Feynman's learning method. 3) Quiz questions of the experimental class and three control classes. 4) Quiz scores of the experimental class and three control classes. The study collected data by means of mathematical statistics, which found 1) Over 80% of teachers and over 85% of students have little knowledge of the Feynman's learning method, so overcoming the problem of insufficient understanding is necessary when applying it. 2) It is feasible to promote the Feynman's learning method in music education in universities, and it can achieve good results. The classes using the Feynman's learning method had average scores in in-class quizzes that were 4.3, 4.5, and 6.5 points higher than three classes using traditional teaching methods, respectively. 3) The application of the Feynman's learning method in music education in universities requires multiple strategies.
Keywords: College Education, Music Education, Feynman's Learning Method

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INTRODUCTION

In recent years, China has witnessed a progressing on its education for all-round development, especially in art area that music aesthetics take priority over the others.

Music teaching is a comprehensive subject. Music courses in universities can not only teach students basic knowledge of music, but also help them better understand the relationship between themselves and music, establish a good aesthetic outlook and outlook on life, and cultivate all-round cultural accomplishment. However, at present, the music teaching mode in many universities still stays in the traditional way of "learning from famous teachers and gradually", lacking effective teaching means and methods. (Wu, 2018). In order to improve the present situation of music teaching, we should explore new teaching methods. On the one hand, with the help of advanced music technology, such as music production software, electronic organ, digital musical instrument, etc., students' interest and enthusiasm can be stimulated through practical and creative learning methods. On the other hand, students can participate in concerts, competitions, performances and other activities to encourage them to actively participate, show themselves, communicate with each other and make progress together. (Liu, 2015). In addition, music teaching needs to strengthen interdisciplinary integration, and deeply integrate music with other disciplines, such as combining music with history, art, literature, science and technology, etc., to create music courses with characteristics and depth. At the same time, we should strengthen the construction of teachers, improve their teaching ability and accomplishment, encourage them to innovate teaching methods, combine theoretical teaching with practical teaching, and promote students' all-round development. To sum up, reforming music teaching methods and exploring innovative teaching modes are the key to improve the teaching quality of college music courses. Only in this way can we really stimulate students' interest in learning music, improve their music literacy and promote the development of music education. At the same time, in music class, teaching method is still the first choice for teachers. But for young people, the traditional teaching method seems to save time and effort, but the author found through tests that students have poor mastery of professional knowledge and skill of music, or the knowledge that is not closely related to life. In addition, considering students' attention and social requirements for talents' ability to learn independently and analyze problems, the traditional teaching mode is ineffective. Feynman’s learning method is a better method suitable for curriculum reform and ability improvement. Learning pyramid is a theory of modern learning style, which was first discovered and put forward by Edgar Dale, a famous American learning expert in 1946, and is the research result of the National Training Laboratory in Maine, USA. It can be seen that traditional learning methods, such as listening and reading, belong to passive personal learning, and the learning absorption rate is less than 30%. If active learning methods, such as group discussion and teaching others, the learning absorption rate can reach more than 50%, while "simulated teaching", the absorption rate of this method reaches 90%. This coincides with Feynman's learning method, and also meets the needs of improving students' grades and developing their comprehensive abilities. (Han & Liu, 2020). Feynman's learning method requires students to connect knowledge points with the reality of life, deepen their mastery of knowledge points with "teaching instead of learning", and reflect on knowledge points by themselves, which is suitable for the requirements of music teaching reform. This study takes Feynman’s learning method as a breakthrough and applies it to music teaching in order to improve college students' mastery and music learning ability, and also hopes to provide some reference for college teachers in teaching practice.

LITERATURE REVIEWS

Constructivist learning theory, which emerged in 1980s, still has a far-reaching influence on contemporary education and teaching. The theory of constructive learning is developed on the basis of behaviorism learning theory and cognitivism learning theory, and belongs to an important branch of cognitivism theory. Constructivism holds that learning is a process in which learners actively construct knowledge, highlighting the dominant position of learning, taking students as the center, emphasizing learners' active exploration, active discovery and active construction of knowledge, and holding that learning is a process in which learners generate meaning and construct understanding based on their original knowledge experience, which is often completed in social and cultural interaction. Constructivist view of knowledge emphasizes the "dynamic nature" of knowledge, and holds that knowledge is an individual's understanding and hypothesis of reality. Influenced by experience and culture, everyone has different construction and understanding of knowledge. From the learner's point of view, constructivist learners do not passively receive knowledge from the outside world and store it in memory like traditional teaching, and transfer knowledge from teachers to students' notebooks. Instead, they combine existing experience, analyze and comment on knowledge through continuous interaction with the outside world, and finally reorganize and rebuild to construct a new understanding of knowledge. Constructivism has a profound ideological origin, which is quite different from the traditional learning theory and teaching thought and has important guiding value for instructional design. From the perspective of teachers, constructivism tends to regard teachers as helpers and collaborators of students' learning. Teaching is not a single transfer of knowledge from teachers to students, but a process in which teachers guide students to "grow" new knowledge and experience from the original knowledge and experience in the situation and cooperation between teachers and students. The teaching mode guided by constructivism is a student-centered and student-oriented teaching mode. The ever-changing means also make constructivism theory develop well and the teaching environment of universities be optimized and promoted. In the construction theory, students have a central position, and teachers are more like partners and guides. Music teachers can combine Feynman's learning steps to guide students to build new knowledge on the basis of their original music knowledge and life experience. Humanistic learning theory emerged in America in 1950s and 1960s, based on humanistic psychology, represented by A.H. Maslow and Carl R. Rogers. The theory of humanistic psychology analyzes the development process of learners from the perspective of holistic education, and holds that learning is the whole spiritual activity combining emotion with cognition, a kind of self-development and self-construction of students, and a kind of life activity; Teaching is based on the idea of cultivating "perfect people", paying attention to people's own value and students' needs and wishes for learning, so as to develop human nature and realize themselves. Humanism emphasizes that people should be described completely and comprehensively, and thinks that to study people's behavior, we must understand the world he perceives, that is, we must look at things from the perspective of the actor himself. To change a person's behavior, we must first change his belief and perception. On the one hand, it opposes behaviorism to regard human beings as animals and machines; On the other hand, cognitive psychology ignores the influence of human emotions, attitudes and values on learning, and thinks that human values and development should be emphasized, and the self-realization tendency of human beings to exert their potential should be affirmed. Humanists emphasize that students should be the center to construct learning situations, paying special attention to learners' personal perception, emotion, belief and intention, and think that they are the "interior" that leads to differences between people. Humanistic learning theory advocates meaningful free learning view and student-centered teaching view, which coincides with Feynman's learning method. In the conceptual analogy stage, college students can choose their own life experience or original knowledge for new

knowledge. In this process, college students can find the relevance between new knowledge and themselves, and meaningful learning comes into being; In the learning stage, college students choose their favorite expressions to output new knowledge; In the stage of evaluation and reflection, college students constantly review new knowledge; In the stage of language simplification, college students will have overall control over knowledge and become familiar with it. The application of Feynman's learning method to music teaching in universities will increase the guidance and evaluation of music teachers to the whole process and improve the music learning level of college students. Conceptual transformation theory originated from the rise of constructivism theory in 1980s. Vygotsky first defined pre-scientific concepts and scientific concepts in his conceptual transformation theory, which made people realize that learners are not a "blank sheet of paper" before teaching, and there are many concepts in their brains that are inconsistent or even opposite to scientific concepts. Transformation theory is a theory that tries to understand and explain how these previous concepts are transformed into scientific concepts. There are two types of concepts, including assimilation and adaptation. Assimilation refers to the use of existing concepts to explain new phenomena, while adaptation refers to learners' dissatisfaction with the original concepts, while new concepts are understandable, reasonable and effective, and learners use the connection and difference between old and new scenarios to learn. At present, there are some knowledge points that students can easily understand, and there are also complicated knowledge points that are difficult to understand in college music courses. This kind of knowledge is only taught by teachers, and it is difficult for students to have an intuitive impression. The step of Feynman's learning method is concept analogy. In this stage, students can compare complex new knowledge with their own life experience and original knowledge reserve concepts, and assimilate or adapt complex concepts to learn new knowledge. Feynman's Learning Method Conceptual Transformation Theory Peter J. Aubusson (2006) applied Feynman's learning method to science education, supplemented by activities, saying that Feynman's learning method can greatly increase students' interest in scientific knowledge; Larisa V. Shavinina (2009) said Feynman's learning method can quickly learn complex knowledge, enhance the sense of learning achievement, and improve learning motivation; Gabriele Kaiser (2017) applied Feynman's learning method to mathematics teaching, emphasizing that the language simplification stage enables students to build their own knowledge of mathematics knowledge Framework; Wu Yuhui (2019) applied it to the teaching of materials science, and concluded that the Feynman's learning method is suitable for the learning process of materials subjects through practice. It can consolidate knowledge points in a timely and effective manner, effectively improve learning efficiency, and at the same time. It is compared with the traditional Chinese teaching thought of "teaching benefits each other". Zhang Lei (2020) and others applied the Feynman's learning method to the teaching of basic physics, introduced in detail the steps to use the Feynman's learning method in the teaching process of physics, and learned the "momentum theorem" efficiently in combination with the movie "The Martian" At the same time, it puts forward the requirements for teachers to arrange time reasonably and strictly examine the scientificity of knowledge. The application of Feynman's learning method provides a meaningful reference for the in-depth development of natural science foundation and related course teaching and the improvement of students' comprehensive quality. In addition to physics, chemistry and other science subjects that need to understand concepts and use formulas, Chu Xiaoli (2020) applied Feynman's learning method to the teaching of history of liberal arts subjects. The examples of the 24 emperors in the Western Han and Eastern Han Dynasties emphasize the need for optimization measures of repeated review and conceptual simplification in the history teaching of Feynman's learning method. Liu Weitao (2020) introduced the Feynman's learning method into junior high school English learning, allowing students to learn English reading comprehension by recording videos. Interest in reading

comprehension. The wide range of applications of Feynman's learning method is not only reflected in the teaching application of different subjects, but also in the application of different course types. In addition to the learning of the new teaching content mentioned above, Liu Chen (2019) introduced the Feynman's learning method into the practical course, established an operation system that is "teacher-oriented, student-centered, and encourages all students to participate together", and rationally uses The characteristics of the three-dimensional integration of "teaching, scientific research, and competition" of teachers cultivate students' abilities of independent analysis, mutual assistance and cooperation, and multi-dimensional problem solving in the process of technological innovation. Xia Suwei (2020) introduced the Feynman's learning method into the review course, and designed seven processes of content reconstruction, problem phasing, non-systematic presentation, systematic structure, exercise consolidation, intervention guidance, and cognitive strategy penetration. Taking functions as an example, expanding the current mathematics review class from "two basics" to "four basics", and constructing a student-centered review class teaching model, which has a good effect. Li Ping (2020) introduced the Feynman's learning method into psychological counseling courses, which not only enhanced students' sense of accomplishment, but also highlighted the experiential nature of psychology courses and the interactive participation of students. According to relevant information, in 1960s, many scholars further studied how to improve the efficiency of the teaching process and made a detailed interpretation. Until 1980s, there was a major breakthrough, and a large number of them gathered at such a time. For example, "Effective Teaching and Guidance" by Kurlen Droz, "Effective Teaching Methods" by Gary D Paulich of the United States, and so on. However, in the specific high school music appreciation class, there is no corresponding information to explain the corresponding teaching methods, but there are some articles in detail introduced some foreign more influential music teaching methods. For example, Dalkroz in Switzerland, Orff teaching method in Germany, Kodaly teaching method in Hungary, Suzuki teaching method in Japan and so on. The book Kodaly's Music Education Thought and Hungarian Music Education clarifies that singing is the main means of music education. Kodaly's idea of music education fully explains his emphasis on local music. He once said, "Let every child know Hungary while singing folk songs". In Japan, "performance" and "appreciation" are two fields of music education, and "performance" is dominant in singing. All these can show the necessity of using singing teaching in music appreciation teaching, especially in Japan. However, I have not seen a detailed foreign works on how to apply Feynman's learning method to music, which can better reflect the value and significance of Feynman's learning method applied to music classes in ordinary universities. Combination of Feynman's Learning Method and Music Appreciation Music appreciation is mainly through listening and feeling music and learning music history and culture to cultivate students' music ability and evaluation and judgment ability, which is the main channel to enhance students' music culture accomplishment. Music appreciation class is not only to play music works that students need to appreciate and popularize music-related knowledge, but also to improve students' music appreciation ability and guide students to comprehend and understand the deeper meaning of works, so as to better achieve the purpose of "taking music as the core". Music is the art of hearing, space, image and expression. Music class is a comprehensive practical course to cultivate students' auditory perception, emotional experience and imagination and association of works. Music appreciation is an indispensable part of music class. Using Feynman's learning method, students can exchange their own experiences in class, which is conducive to inspiring students to think about each other. From other people's evaluation, students can also live to appreciate music and evaluate music from different angles, so as to meet the deeper requirements of listening and appreciating music works. This study can stimulate students' interest in class by guiding students to listen to works and appreciate the beauty of music, and then let students be "little teachers" of each other.

From appreciating music to knowing how to appreciate and evaluate music, we should actively guide and cultivate students' perception and judgment of listening music, so as to better improve students' music culture accomplishment and aesthetic value of music. Realize the important role of music appreciation module in music courses in colleges and universities and its own value significance.

RESEARCH METHODOLOGY

Population and Sample: This research aims to investigate students in Audio Performance Department of Hebei Academy of Fine Arts in Hebei Province, China. The sample group is 286, including 47 college teachers and 239 students Audio Performance Department of Hebei Academy of Fine Arts in Hebei Province, China. The size was determined by calculating the Taro Yamane sample size (Taro Yamane, 1967) at the reliability level of 95%, and the error is less than 5%.

Research Instruments: The Chinese and English questionnaires of "Questionnaire on the Use of Feynman Learning Method". Teaching plans combined with the principles of Feynman's learning method. Quiz questions of the experimental class and three control classes and Quiz scores of the experimental class and three control classes.

Data Collection: Basic Statistics, Percentage and Standard Deviation

$Var = \Sigma (x_i - \bar{x})^2 / (n - 1)$ Among them, Σ represents the summation symbol;

i ranges from 1 to n; x_i represents the i-th data point;

$\bar{x}$ represents the sample mean;

n represents the number of sample data.

RESEARCH RESULTS

The main reason for this phenomenon is that the traditional teaching mode has been adopted for a long time in music classrooms in secondary vocational schools. Students mechanically memorize the content taught by teachers, and cannot connect with real life and apply the music knowledge they have learned to reality. Feynman observed the class situation in the engineering college. The students listened carefully and recorded the repeated words of the professor. They could copy word by word and memorize them accurately. They could answer "what is diamagnetism" correctly, but they could not give examples of diamagnetism. The situation of secondary vocational students learning music is the same. Students can only copy and record the knowledge explained in the teacher's class, and they can also cope with the exam, but they do not have a deep and life-like understanding and mastery of the knowledge points.

Table 1 the application of the second step of Feynman's learning method

Options	**Frequency**	**Percent**
classmates and friends	217	90.6
Parents	67	28.1
yourself	112	46.9
others	49	20.3
Total		**100.0**
yes, they can listen to my knowledge carefully and give feedback in time	158	66.1
relatively, they can listen to the lecture	81	33.9
general, feel not interested in what I say	0	0.0
uncooperative, so I don't like to explain to others	0	0.0
Total		**100.0**
Classmates and friends	219	91.4

Options	Frequency	Percent
parents	71	29.7
yourself	108	45.1
others	61	25.7
Total		**100.0**
cooperative, can listen to my knowledge carefully and feedback	120	50.0
what they don't understand in time cooperation	102	42.8
they are just willing to listen	14	6.0
general, feel not interested in what I say	3	61.2
Total		**100.0**

Table 1 Secondly, ask questions about the second step of the Feynman's learning method, teaching (promoting learning through teaching). By asking the objects in the stage of "promoting learning through teaching".

It can be seen that 91.4% of the students will choose their classmates and friends, including 45.1% of the students would choose to tell themselves this way without the help and response of others, only 29.7% of the students would choose to tell the knowledge to their parents, and 25.7% of the students would choose other people. The answers include teachers, netizens, etc. choose. In the process of "promoting learning through teaching", the students still got a relatively good response. 50% of the students said that the other party could listen carefully and communicate with feedback in a timely manner.

Through the survey, it can be found that the first choice for students to adopt the method of "promoting learning through teaching" at this stage is classmates and friends of the same age. Firstly, the school environment is convenient for students to communicate. Students are more willing to communicate with peers; the second choice is to tell themselves, which is also a convenient, efficient, and low-cost method, which not only avoids the embarrassment of not finding a suitable "teaching to promote learning" object It also effectively avoids gaps in communication between peers; the third choice is parents. Some students get along well with their parents. They are willing to share what they have seen and heard with their parents, and their parents can listen carefully. , thus forming a virtuous circle. However, there are still many students who have difficulty communicating with their parents in a friendly and harmonious way during adolescence, and teenagers no longer like to chat with their parents about what they have seen, heard and learned like they did when they were young.

DISCUSSION & CONCLUSION

This study conducted a survey questionnaire and interviews with music teachers and students in universities, and applied Feynman's learning method to music teaching in universities for practical research. The following conclusions were drawn:

1) It is difficult to promote the application of Feynman's learning method in music teaching in universities. The questionnaire survey shows that over 80% of teachers and over 85% of students have little knowledge of Feynman's learning method, so in applying it to music teaching in universities, it is necessary to overcome the problem of teachers and students having too little understanding of it.

2) The application of Feynman's learning method in music teaching in universities requires multiple strategies. This study proposes optimization strategies from the perspectives of music teachers and students. From the perspective of teachers, firstly, expand the promotion of Feynman's learning method and enhance teachers' and students' understanding of "teaching as a substitute for learning"; Secondly, encourage teachers to change their thinking and have the courage to apply new teaching models; Thirdly, pay attention to the accuracy of course content and ensure the systematic nature of classroom content; Finally, establish a new learning

evaluation system that values students' learning process. From a student's perspective, firstly, enhance awareness of the importance of music courses; secondly, enhance learning initiative and change passive learning methods; finally, improve the efficiency of learning and arrange the study time of each subject reasonably.

3) Promoting Feynman's learning method in music teaching in universities is feasible and can achieve good results. After proposing the 3C principles for the application of Feynman's learning method, this study applied Feynman's learning method to the teaching of music courses in universities. Students perform well in the classroom, and most of them retell the knowledge points fluently without violating the knowledge in the textbook; through in class tests, this method also has a significant effect on improving students' grades. The average scores of the classes using Feynman's learning method in the class quiz were 4.3 points, 4.5 points, and 6.5 points higher than those of the three classes using traditional teaching methods, respectively. This study also adopts the method of students telling stories and applies Feynman's learning method to the teaching of music courses in universities. The stories created by students have a high degree of compatibility with the newly taught knowledge, and they can also comprehensively and accurately understand classroom knowledge, improving students' learning enthusiasm and deepening their understanding of the knowledge points. After the course was completed, a questionnaire survey was conducted on the classes using the Feynman's learning method teaching mode. The experimental class students scored significantly better than the control class in terms of interest in knowledge content, liking of teaching methods, self-evaluation of expression ability, and self-evaluation of knowledge mastery. However, in the survey of accuracy evaluation of classroom content and course organization evaluation, there was no significant difference in scores between the experimental class and the control class.

REFERENCES

Cai, Y. (2018). Application of the Feynman's learning method in high school mathematics learning. *New Curriculum (Part 2)*, (07), 65.

Cheng, J. (2017). *Good Study: Personal Knowledge Management Improvement Guide*. Beijing: CITIC Publishing House.

Feynman, R. (1999). *Surely You're Joking, Mr. Feynman!*. Beijing: China Social Sciences Press.

Feynman, R. (2005). *What Do You Care What Other People Think?*. Shanghai: Life Reading New Knowledge Joint Publishing House.

Gleick, J. (2004*). Genius: The Life and Science of Richard Feynman*. Beijing: Higher Education Press.

Han, Y., & Liu, W. (2020). The core essence of improving the quality of vocational education: Promoting comprehensive quality management of vocational education from the perspective of large-scale quality. *Vocational and Technical Education, 41*(36), 7-11.

Weng, H., Xiong, H., & Yu, L. (2020). Practice exploration of the grid-based initial education of "circle-chain-point" in universities: A case study of Shanghai Second Light Industry School. *Modern Teaching,* (08), 60-62.

Wu, L. (2020). Analysis of the application of project teaching method in vocational tourism geography teaching. *Journal of Hubei Open Vocational College, 33*(07), 162-163.

Wu, X. (2018). Mastering the Feynman technique of teaching as learning to improve the learning efficiency of university students. *Youth and Society,* (30), 113-114.

Young, S. (2013). *How to Learn Efficiently*. Beijing: China Machine Press.

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