Optimization Analysis of University Music Education Mode Under the Background of Artificial Intelligence

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Abstract

In recent years, the active attempts and breakthrough progress of artificial intelligence (AI) in university music education have been amazing. In this regard, the purpose of this paper is to study the optimization of university music education models under the background of AI. this paper first describes the birth of AI and its evolution and development in music education. Then, this paper uses questionnaire survey methods to understand undergraduate' understanding, likes and cognition of college music education models, and obtains a true and reliable basis, so as to more truly understand the necessity of combining AI and music education. Based on the results of investigation and research, this paper uses AI technology to optimize the university music education model. this paper integrates AI technology into music education reasonably and effectively, and uses the powerful intelligence of AI to transform music education into interesting and passionate education, which can guide undergraduate to actively participate in learning. Finally, this paper compares the optimized university music education model with the traditional music education model. Experimental results show that the optimized college music education model has been recognized and loved by more undergraduate, and students' love for music has increased by about 15%, which has played an important role in improving students' enthusiasm for learning music, and is an optimization study of university music education models. Provide an important reference.

Keywords: AI, University Music Education Model, Optimization Analysis, Comparative Experiment

1 INTRODUCTION

Music school is a very important subject in art school education [1]. There is no doubt that its status in art education cannot be underestimated. Music has its unique charm, and its language is also unique. In the process of enjoying music, some people may say that I don't understand, but everyone likes music very much [2-3]. It enables people to enter the cage of imprisoned thought in its unique way [4]. There is some great music that allows the audience to listen to the sound in the process, calm their emotions and inspire inspiration. Music education in colleges and universities (CAU) is an important part of aesthetic education [5-6]. From the current research and analysis, many CAU believe that music education is the main way to improve the aesthetic level of students [7]. Therefore, it is very necessary to optimize university music education through AI.

At present, with the continuous development of AI technology, various teaching models created by AI and other related technologies have emerged [8]. In foreign countries, Pandian has studied a kind of smart piano, which can have its own recording program and can automatically perform instrumental works of different styles according to the settings of different programs. Compared with the previous electronic musical instruments, it has undergone changes in tone quality, performance effects, sequence functions, and other pronunciation methods [9]. In China, Han Qingbin uses programming and algorithms to create main, harmonic or polyphonic music. It can also store a variety of timbres in the system, and even simulate the sounds of animals and other objects.[10]

This paper studies the optimization of university music education mode under the background of AI. this paper integrates AI technology into music education reasonably and effectively, and uses the powerful

intelligence of AI to transform music education into interesting and passionate education.

2 OPTIMIZATION TECHNOLOGY OF UNIVERSITY MUSIC EDUCATION MODEL UNDER THE BACKGROUND OF AI

2.1 *AI Helps Break Through the Bottleneck of Online Education*

AI technology will significantly optimize the sense of on-site teaching in online education, making students feel immersive like classroom education, and can accurately judge and analyze the mastery of each student, gain insight into the blind spots of their knowledge and skills, and target them in a targeted manner. Provide guidance for each student's weak links, effectively realizing personalized teaching. In the near future, with the assistance of big data and AI, the sense of on-site teaching of online education can be fully realized, making more students willing to choose online education and training.

2.2 *Optimization of AI in University Music Education*

2.2.1 *Improving the quality and effectiveness of teacher teaching*

AI technology will improve the quality and effectiveness of teacher teaching. In the teaching process. Teachers should respect the individuality of students, understand the mental development of students to carry out teaching, preparation and design of teaching programs. If the teacher does not know the students very well, or violates the laws of the physical and mental development of the students and the character of the students to cultivate, I am afraid they will not achieve good teaching results. In the teaching process, it is not conducive to the development and intellectual maturity of students.

2.2.2 *Learning ability*

During the application of AI in computer network technology, it can input data with lower difficulty and perform logical calculations and inferences. Obtaining better-level data information can not only shorten the search time of network information to a large extent, but also play a strong practicability in NM, and further accelerate the speed of network operation.

2.3 *AI Extraction Algorithm*

The determination of the fitness function affects the choice of AI extraction algorithm results. this paper uses the following three constraints to determine the corresponding fitness function.

2.3.1 *Constraints on the proportion of academic qualifications*

In the same way, the degree to which the proportion of academic qualifications meets the requirements of the proposition can be obtained:

$$f_1 = 1 - \frac{\sum_{i=1}^{cnum} |\sum_{j=1}^n (t_{ij} - d_j)|}{P} \qquad (1)$$

Among them, cnum is the classification number of academic qualifications. For each type of academic qualification i, the corresponding academic qualification t_{ij} of the individual selected student j is subtracted from the user-specified academic qualification d_j, $f_1 \in [0,1]$, the larger f_1 indicates that the educational qualification ratio constraint is satisfied the better, when $f_1 = 1$, fully meet the educational background ratio.

2.3.2 *Constraints on the age ratio*

In the same way, the degree to which the age ratio meets the requirements of the proposition can be obtained:

$$f_2 = 1 - \frac{\sum_{i=1}^{anum} |\sum_{j=1}^n (t_{ij} - d_j)|}{P} \qquad (2)$$

Where anum is the number of age classifications. For each type of age i, the corresponding age t_{ij} of the student j selected by the individual is subtracted from the user-specified age d_j, $f_2 \in [0,1]$, the larger f4 indicates that the age ratio constraint is satisfied the better, when $f_2 = 1$, fully meet the age ratio.

2.3.3 *Constraints on the grade ratio*

In the same way, the degree to which the ratio of working years meets the requirements of the proposition is:

$$f_3 = 1 - \frac{\sum_{i=1}^{wnum} |\sum_{j=1}^n (t_{ij} - d_j)|}{P} \qquad (3)$$

Where wnum is the classification number of the grade. For each type of grade i, the corresponding grade t_{ij} of the individual selected student j is subtracted from the user-specified grade d_j, $f_3 \in [0,1]$, the larger f_3 indicates that the grade ratio constraint is satisfied the better, when $f_3 = 1$, fully meet the grade ratio.

3 EXPERIMENTAL RESEARCH ON OPTIMIZATION OF UNIVERSITY MUSIC EDUCATION MODEL UNDER THE BACKGROUND OF AI

A set of 375 valid samples data were collected in this document. First, the reliability of each variable in the research theoretical model is checked to determine the

reliability and validity of each scale. Specifically, this paper first investigated the views and opinions of some students from the four universities on the current university music education. After that, this paper uses AI technology to optimize the university music education model, and then compares it with the traditional music education model to discuss the optimization effect of AI technology on the music education model.

4 EXPERIMENTAL ANALYSIS OF OPTIMIZATION OF UNIVERSITY MUSIC EDUCATION MODEL UNDER THE BACKGROUND OF AI

4.1 *undergraduate' Views on the University Music Education Model*

In order to study the opinions of undergraduate on the university's music education model, this paper collects statistics from the questionnaire survey and analyzes and compares them. As shown in Table 1 and Figure 1.

Table 1. undergraduate' Views on the Mode of University Music Education

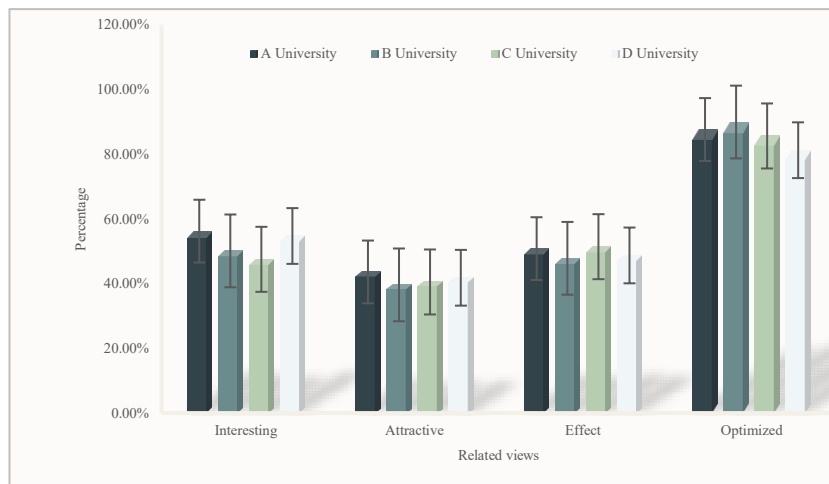|	Interesting	Attractive	Good learning effect	Needs to be optimized
A	56.2%	43.6%	50.8%	87.6%
B	50.1%	39.6%	47.8%	89.9%
C	47.5%	40.5%	51.4%	85.6%
D	54.7%	41.8%	48.7%	81.2%

Figure 1. undergraduate' Views on the Mode of University Music Education

It can be seen from the survey data that most students among the interviewees do not recognize the traditional university music education model and hope to be optimized. These students recognize the importance of music education for their own development, and also reflect from one aspect that the development of university music education models needs to be strengthened. However, only a few think that the traditional music education model is effective. This also confirms the importance of this paper using AI technology to optimize the university music education model.

4.2 *Comparison of the Effects of Two Music Education Modes*

In order to further verify the effect of the optimized music education model, this thesis uses the random sampling method for the random selection of one hundred students from each of the four universities examined, 50 of whom use the optimized music education model. Another 50 students use traditional music education models. Then, within the specified period of time, count the changes in the degree of enthusiasm of undergraduate in learning music.

Table 2. Comparison of the effects of two music education models

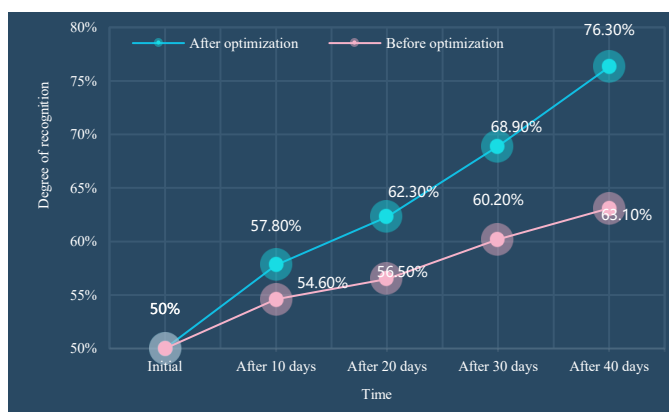|	Initial	10 days later	20 days later	30 days later	40 days later
After optimization	50%	57.8%	62.3%	68.9%	76.3%
Before optimization	50%	54.6%	56.5%	60.2%	63.1%

Figure 2. Comparison of the effects of two music education models

This paper conducts statistics on selected 100 music majors in order to observe the changes in their recognition of the two music education modes and changes in their learning enthusiasm. From the experimental data, it can be seen that the music education model after the innovation of AI technology has a better effect. undergraduate are becoming more and more active in learning music, and the effect is getting better and better. Although the degree of change in the degree of university students' learning enthusiasm is not the same, this is mainly caused by personal circumstances, but they all have a certain degree of improvement. This is because this paper uses AI technology to optimize the traditional university music education model and adds more functions. It can be rationally designed and forecasted according to the actual situation of each university student, combined with the previous learning situation, and developed a targeted Sexual education plan, thereby effectively improving the learning effect of students.

5 CONCLUSIONS

This paper studies the optimization of university music education mode under the background of AI. this paper first explains the birth of AI and its evolution and development in music education. Then, this paper learned about undergraduate' understanding, preference and cognition of the university music education model. Based on the results of investigation and research, this paper uses AI technology to optimize the university music education model. This paper integrates AI technology into music education reasonably and

effectively, and transforms music education into interesting and passionate education with the powerful intelligence of AI. Through the research of this paper, college students can be guided to actively participate in learning. The optimized music education mode is more recognized and loved by college students. The next research direction of this paper is to use AI to extend to other disciplines for intelligent education.

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