Hindawi
Advances in Multimedia
Volume 2023, Article ID 9859854, 1 page
https://doi.org/10.1155/2023/9859854

Retraction

Retracted: Strategies of Using Multimedia Technology to Optimize Music Classroom Teaching in Primary and Secondary Schools

Advances in Multimedia

Received 15 August 2023; Accepted 15 August 2023; Published 16 August 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] Y. Deng, "Strategies of Using Multimedia Technology to Optimize Music Classroom Teaching in Primary and Secondary Schools," *Advances in Multimedia*, vol. 2022, Article ID 7256331, 11 pages, 2022.

Hindawi
Advances in Multimedia
Volume 2022, Article ID 7256331, 11 pages
https://doi.org/10.1155/2022/7256331

Research Article

Strategies of Using Multimedia Technology to Optimize Music Classroom Teaching in Primary and Secondary Schools

Yu Deng

Conservatory of Music, Guizhou Normal University, Guiyang, Guizhou 550001, China

Correspondence should be addressed to Yu Deng; dengyu_edu@126.com

Received 6 September 2022; Accepted 23 September 2022; Published 5 October 2022

Academic Editor: Tao Zhou

Information technology has entered every aspect of life. The music classroom is no exception for training music talents. The development of information technology has become an inevitable trend of social development. Not only the call of the era of computer multimedia teaching but also the music curriculum standard under the background of quality education has put forward high requirements for today's computers. From this, we can realize that it is crucial to transform teaching concepts, actively practice and explore, and seek new teaching models. As the main auxiliary teaching method, multimedia technology is known and used by most primary and secondary schools, and is widely used in music classroom teaching. This paper deeply analyzes the role and position of multimedia in music teaching in junior high school music classroom teaching, compares multimedia technology with other educational technology means, and explains the advantages and limitations of the implementation of music classroom teaching assisted by multimedia educational technology means. At the same time, this paper turns the cognitive problem of selective attention into the problem of measuring the auditory attractiveness of objectively existing music parts. The specific process is as follows: first, on the CQT spectrum of real music audio, this paper uses the auditory cognitive model based on auditory saliency, and uses the Bayesian inference mechanism of time series to propose the calculation method of quantitative features of auditory saliency. Then, TANN network is used to identify multiple auditory significant subbands as candidate semitones, and a priori knowledge obtained from the generalized chord structure is introduced to standardize the chord like structure at each time in the candidate melody stream, which improves the accuracy of the melody stream's description of the original music. Finally, according to the data analysis of teaching practice, the teaching objectives of "order" and "circulation" in social and natural life have been well realized through "rhythm" insight in this teaching practice unit.

1. Introduction

With the advent of the 21st century, the learning speed of generations is amazing [1]. As a medium and tool of modern information teaching [2], modern teaching information technology provides a more diversified and dynamic new teaching method and better teaching conditions for modern music classroom teaching [3]. Under the guidance of multimedia technology, the reform and innovation of teaching methods can be realized. Applying multimedia technology to music teaching activities in primary schools, teachers use multimedia technology to show it to students in combination with teaching content, and use multimedia diversified ways to show students the teaching content through pictures, videos, etc., so as to inject new energy into traditional teaching activities. Through the integration of vision and hearing, students can effectively broaden their horizons and guide their comprehensive development. The practical application of multimedia in middle school music classrooms compared with the traditional teaching mode, the application is more flexible and convenient, and the extensive use of multimedia in music classroom teaching has laid an effective way to establish a comprehensive music-teaching platform [4]. Therefore, music education circle [5] in music classroom teaching focus on cultivating students' strong interest in independent learning, and require teachers to find appropriate teaching methods, and use multimedia teaching technology as a key component of teaching aids

and development tools, because the selection of appropriate teaching technology will fully mobilize students' interest in learning and subjective enthusiasm, make music classroom teaching easier, and rationally use teaching technology to promote the design of teaching scenarios, which is conducive to fully mobilizing students' interest in learning [6]. In the teaching process, it expands the students' horizons, plays a key role in the difficult points in the teacher's teaching process, and can more effectively achieve classroom goals [7]. We can learn from it that it is crucial to reform classroom concepts, actively experiment and explore, and pursue innovative teaching methods, and music classroom teaching is no exception [8]. The development of society is also inseparable from the progress of modern informatization [9]. Music education should not only choose multimedia to adapt to the development of the information age but also put forward demands for multimedia in the modern music curriculum standards [10].

"Music Curriculum Standards (2011 Edition)" proposes that "music teachers should rationally use modern educational technology to serve teaching," clearly affirming the advantages of multimedia as an auxiliary teaching technology, rich forms of expression, strong integration features, and excellent interactivity provides a strong support for the realization of the new curriculum standard of music classroom teaching [11]. Through the actual investigation and practice of the school, I found in the process of observation that the application of multimedia technology in the music classroom of junior high school has advantages and disadvantages [12]. When conducting music classroom teaching, it can be properly referenced and practically applied [13].

Multimedia technology integrates various material media such as text, image, animation, and sound [14]. In recent years, many experts and scholars have discussed and researched on traditional Chinese teaching methods, and obtained quite effective results. On this basis, we cannot completely deny traditional teaching methods [15]. Under the background, we must have the mentality of taking the essence and discarding the dross, integrate traditional teaching methods with new teaching models, and conduct comprehensive research on the shortcomings of multimedia teaching in music classroom teaching to find the best combination between the two in order to facilitate the realization of a new teaching method [16]. At present, the multimedia teaching method used in teaching in our country has been very common [17]. However, the advantages of this teaching method, the importance of further improving the efficiency and quality of music teaching, and the role of connecting multimedia teaching with other educational technology methods in academia has not paid much attention [18].

Music education is an important part of quality education, and students should lay a solid foundation in primary education. The age characteristics of primary school students make students more interested in new teaching methods. Moreover, because students are young, simple explanations in the classroom are not conducive to the development of students' interests, and it is difficult for students to keep learning efficiency in the classroom. In this case, educators should change their own teaching mode, combine the auxiliary teaching equipment provided by the school, use information technology to open lively and interesting teaching activities for students, and enhance the students' initiative and consciousness to integrate into the classroom.

2. Materials and Methods

2.1. Instructional Design. It aims to promote learning by creating various effective instructional systems by systematically arranging instructional processes and instructional resources. The development of instructional design as a discipline has integrated many research results of different theories and related technologies, but due to different lives, scientific research backgrounds and life experiences, researchers involved in this discipline often interpret from different perspectives. Therefore, the meaning of instructional design cannot be all the same, resulting in a variety of different understandings [19].

Through the comparative analysis of the published teaching design works and articles at home and abroad, it can be found that researchers have different perspectives and focuses on the definition of the concept of teaching design. The first is the process theory. The meaning I want to express is that instructional design is the planning and elaboration of the entire teaching process, emphasizing the description of the teaching process, rather than other aspects of instructional design. Among them, Professor Umeina, a Chinese education scholar, believes that teaching design is a process of identifying teaching problems, designing teaching goals, formulating teaching plans to solve teaching problems, trying the plans, evaluating the results of the trial, and continuously improving the original plan according to the results of the trial. The second is the method, which focuses on the purpose and significance of instructional design. It believes that instructional design is a systematic approach to research of process, and various activities are in order to obtain the most suitable methods, these most suitable methods can improve students' knowledge and ability. Finally, there is the theory of technology, which emphasizes excavating the essence of instructional design to define the meaning. It is a modern teaching technique that aims to strengthen the planning and rationality of teaching activities [20].

Under the guidance of certain educational thoughts and theories, the teaching mode optimizes the teaching process and designs a relatively stable, systematic, and simplified teaching structure according to the teaching objectives and tasks. Music education in primary and secondary schools is an important part of national quality education, which is nonprofessional music education. Its fundamental purpose is to cultivate qualified talents with all-round development, not music professionals. This nature determines that music education in primary and secondary schools must be targeted at all students, with the task of popularizing music culture and comprehensively improving students' quality. It is necessary to completely change the teaching idea of taking professional music education as the purpose, taking teachers as the center, and simply imparting knowledge and skills.

Music education in primary and secondary schools should be student-centered and take music education as a means to promote the all-round development of students.

2.2. Multimedia Technology. To establish logical connections between various media forms to form a system with interactivity, learners can experience information exchange with various senses. This research also uses computer as the carrier of multimedia technology. Multimedia technology is one of the components of information technology, it is also the fastest growing and most active technology, and it plays an irreplaceable role in the educational field. Multimedia technology is to convert text, pictures, audio and video, animation, and other media forms into binary numbers through a computer, into a presentation method that both users and computers can understand and become a major helper in teaching work. The teaching environment of multimedia technology application in teaching is also different from traditional teaching. The teaching environment based on multimedia technology is an integral part of the current education informationization from the old-fashioned teaching blackboard writing, projection, etc. The teaching environment plays an important role in influencing the teaching effect in terms of audio, video, animation, interactive electronic whiteboard and other teaching means, and methods in multimedia teaching. In the teaching process based on multimedia technology, the support of information technology is needed, but the design of the teaching environment is relatively cumbersome, and the advantages of multimedia assisted teaching are increasingly obvious [21–23].

Multimedia technology originated in the United States in the 1980s, and then quickly penetrated into the field of education. Although multimedia teaching started relatively late in China, it has developed rapidly, especially in higher education. Multimedia teaching (multimedia assisted teaching technology) has become an important symbol of teaching modernization. At present, the academia generally believes that multimedia teaching refers to a teaching method that, according to the characteristics of teaching objectives and teaching objects, through teaching design, reasonably selects and uses modern teaching media, organically combines with traditional teaching methods, participates in the whole teaching process, acts on students with multiple media information, forms a reasonable teaching process structure, and achieves the optimal teaching effect.

2.3. Information-Based Teaching Design. Through informatization teaching, we can deduce the concept of informatization teaching design, which refers to the design of the teaching process in a planned way based on information technology, to create a digital learning environment for students, aiming to optimize and improve the teaching process. Informatization teaching design was proposed by Professor Li Jiahou of Shanghai Normal University. It is to use systematic methods, take learning as the center, make full use of modern information technology and information resources, and scientifically arrange all links and elements of the teaching process to optimize the teaching process. We should apply information technology to build an information environment, obtain and use information resources, support students' independent inquiry learning, cultivate students' information literacy, improve students' interest in learning, and optimize the teaching effect. Its purpose is to train students to conduct independent learning, thinking, and sophisticated thinking in a digital learning environment, improve learners' information literacy and innovative thinking, and achieve teaching goals.

It is an important breakthrough in teaching reform. In the teaching process, teachers make full use of educational resources. Educational information, teaching media and educational technology methods to teach, and formulate information-based teaching models based on teaching theories inject a strong epochalism into the teaching content, change the angle, the learner will be in the leading position, deeply understand the learner's physical and mental development characteristics and cognitive level, stimulate the learner's awareness of active learning, and maximize the realization of personalized teaching. Informatization teaching is not only the application of teaching media in traditional teaching but also should use information technology as an aid to promote the reform of the entire teaching system.

This research believes that the design technology fully integrate information-based resources make reasonable arrangements for all links and elements in the teaching process in the digital teaching environment, learning concentration, and cultivate students' divergent thinking, cultivates their sentiments from multiple perspectives.

2.4. Integration of Information Technology and Curriculum. The digital learning environment aims to establish a teaching method that can support learners' diverse learning, individualized learning, collaborative learning, resource exchange, and other individualized requirements, stimulate learners' enthusiasm and initiative in all aspects of learning, and make traditional classroom teaching easier. Fundamental changes have taken place in the system, and the goal of cultivating innovative spirit and practical ability has been put into practice as shown in Figure 1

The application of multimedia technology to the primary school music curriculum is an embodiment. First, using appropriate music software for music teaching can make music teaching activities more open, interactive, and creative. It can make the abstract become intuitive, the rigid become more vivid, the dull classroom become more active, the students learn easily, the teachers teach easily, and fully reflect the classroom values of the new curriculum standard. Then, use network resources such as geography and tourism skillfully to expand students' vision and increase perceptual experience so that students can understand the connotation of music works from multiple perspectives. The rich music resources (such as MP3 and MID I music) help teachers solve the problem of finding information. The active use of these resources will help students to increase their knowledge, improve their music cultivation and appreciation ability, and better feel the beauty of music. Finally, based on the network environment, the interactive function and timely transmission function are highlighted to realize the

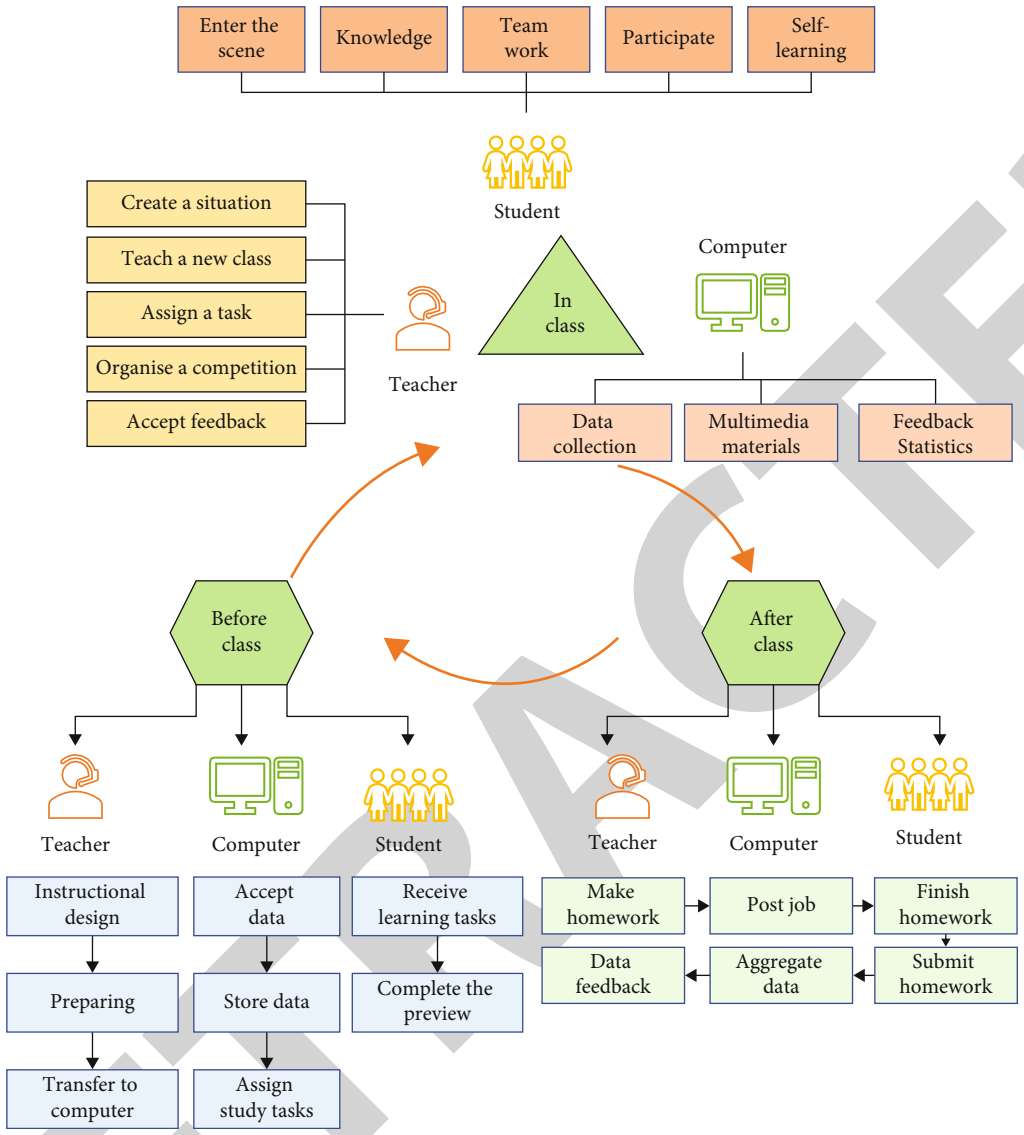

Figure 1: Construction diagram of music classroom teaching mode in primary and secondary schools.

transformation of music teaching methods, promote the development of students' personality, and enhance students' innovation awareness, so as to achieve the integration of information technology and music courses.

3. Results and Discussion

3.1. Music Cognition Based on Selective Attention. From the standpoint of music education, combined with the goal of music education in China, the mastery and application of music psychology knowledge has an important impact on music teaching in primary and secondary schools in China. People often attribute the poor learning ability to the general poor intelligence, but recent research on backward students has proved that the defects of specific knowledge and skills are the reasons for the low learning ability. Such specific knowledge and skills include music learning. Taking the relationship between music and language as an example, both of them have developed in the human cultural system. Music rhythm teaching and singing training can improve the ability of language expression and play a good auxiliary role in learning foreign languages. In addition, the teacher's inspiration and guidance in music appreciation class can make students have rich associations and give full play to their imagination. Moreover, such as the role of music knowledge class, creation class, and other teaching on other disciplines, all of which make us easily realize the heavy responsibility of music teachers.

In order to use the spontaneous selectivity of attention to quantitatively describe the process of the listener's perception of music in a detailed and quantitative manner, it is necessary to quantify the attractiveness of each part of the music (specifically to the instantaneous structure, that is, the individual tones that make up a chord) to human hearing. The degree of attraction determines the direction of the listener's attention, and the part with a high degree of attraction to the hearing will gain the listener's attention. Accordingly, this paper transforms the cognitive problem of selective attention

into a problem of measuring the auditory attraction of each part of objectively existing music. Early auditory attention researchers mostly focused on channel location, while later researchers believed that selective attention was the distribution of cognitive processing energy. Some researcher believed that attention was limited by resource allocation. If more resources were available, sound stimuli would receive more attention and more processing. However, if the quality of sound stimulus is poor or limited by some memory information, no number of resources can be allocated for effective processing (Norman, 1975). Similar to visual attention selection, auditory attention also has top-down processing. When we talk to people in a noisy place, we usually focus on the conversation and ignore other people's conversation and other sounds around. However, if someone mentioned his name nearby, we would probably notice. This is because unnoticed sound stimuli can also be connected with long-term memory, and are processed in working memory due to some correlation.

Here, this paper defines the degree of attraction of music (and other audio) to the listener's hearing as Auditory Saliency (AS), and uses the auditory saliency to propose the following selective attention-based human auditory cognitive model. This paper argues that human selective attention auditory cognition is a special mapping from the set of objective auditory things O to the set of subjective perceptions C

$$f_{\mathrm{AS}} : O \longrightarrow C, \tag{1}$$

where O is the ordered or unordered set of the objective world, the most common O is an audible time series (or time series set) or a collection of audible things with relative positions in space.

In order to use the Bayesian inference theory method to establish a suitable model of the cognitive process of temporal selective attention, this paper firstly establishes the temporal Bayesian inference mechanism. At time $t+1$, for the aforementioned time series objective set O and its prior probability distribution set T, according to Bayesian theory, there are

$$P(T_{t+1}|O_{t+1}) = \frac{P(O_{t+1}|T_{t+1})}{P(O_{t+1})} \cdot P(T_{t+1}). \tag{2}$$

From the perspective of cognition, the prior probability distribution set T_t at time t is actually the experience distribution formed by people based on their own experience and knowledge when the subjective consciousness of the human brain perceives the auditory thing set at this time. In the case where the target data is a time series, the subjective experience distribution $P(T_t)$ will correct itself over time according to the newly arrived data. That is, for any time t, the prior distribution $P(T_{t+1})$ at the subsequent time point $t+1$ can be obtained from the prior distribution at time t

$$P(T_{t+1}) = P(T_t|O_t). \tag{3}$$

Combining the above two equations, we can get

$$P(T_{t+1}|O_{t+1}) = \frac{P(O_{t+1}|T_{t+1})}{P(O_{t+1})} \cdot P(T_t|O_t). \tag{4}$$

In this way, combining the Bayesian inference principle, the basic properties of time series and the theory of cognition, a method for updating the data distribution based on the Bayesian inference mechanism at successive time points can be obtained. As shown in Equations (3) and (4), the prior probability at time $t+1$ is equal to the posterior probability ()ttOTP obtained at time t, and the posterior probability at time $t+1$ ()tt++11OTP, only relevant to the previous moment, not to other moments.

3.2. Calculation of Auditory Saliency Features. In this section, on the CQT spectrum of real music audio, the auditory cognitive model based on auditory saliency proposed in the previous section is adopted, and the Bayesian inference mechanism of time series is used to propose a calculation method for the quantitative feature of auditory saliency. The basic idea is, since the difference in the sense of hearing presented by music is formed by the superposition, combination and change of musical tones, and the most basic unit of the interval between these musical tones is a semitone, then all possible frequency ranges of musical tones can be used. It is divided into subbands with semitone as the basic unit, and each subband is searched at each moment, and its spectral characteristic changes are checked and quantized, and finally the required auditory saliency features are obtained.

For time t, the likelihood function ()tt++11TOP can be understood as the newly emerging observed data distribution under the subjective prior distribution. Assuming that this data distribution is Gaussian, the distribution of newly emerging observations within a range of 100 cents (a chromatic subband) centered on the pitch of each standard scale is

$$P(O_t|T_t) = P(x_O[t,k]), x_o[t,k] \propto G\left(\bar{\mu}_i(t), \sigma^2\right). \tag{5}$$

For the spectral density data xr$[t,k]$ of the real internal spectrum reflected in the subjective perception consciousness within the range of 100 cents centered on the pitch of each standard scale, and reflect the cognition in the subjective consciousness at this moment The posterior distribution ()ttOTP of the mapping result is caused by the distribution of spectral data within the subband, then the posterior distribution of the i-th subband at time t is

$$P(T_t|O_t) = P(x_r[t,k]), x_r[t,k] \propto G\left(\mu_i(t), [\sigma_i(t)]^2\right), \tag{6}$$

where k——[] + +−∈10050, 10050iik $i = 1, 2, \cdots, 61$; $(t)i\mu$ is the mean parameter of the posterior Gaussian distribution of the cognitive image results in the subjective consciousness, and $(t)i\sigma$ is the standard deviation parameter of the posterior Gaussian distribution of the cognitive image results in the subjective consciousness

The posterior data distribution of the i-th subband at time $t+1$ is

$$P(T_{t+1}|O_{t+1}) = P(x_r[t+1,k]). \tag{7}$$

According to the properties of the normal conjugate distribution inferred by Bayes, when the Gaussian function with known variance is used as the likelihood function, the parameters of the posterior probability Gaussian distribution can be obtained from the prior distribution according to the classical method. Then, the posterior data distribution parameters of the i-th subband at time $t+1$ can be obtained by calculation

$$\sigma_i(t+1)^2 = \left(\frac{1}{[\sigma_i(t)]^2} + \frac{1}{h^2\sigma^2}\right)^{-1}. \tag{8}$$

For subband $i$at time t, we have:

$$\bar{x} = \sum_{k=0}^{99} x_r[t, 100_i + k - 50] \tag{9}$$

where ixis the average value of all CQT spectra in the subband.

Also

$$\overline{\overline{x_i}} = \sum_{k=0}^{9} x_r[t, 100i + k + m], m \in (-50, 40), \tag{10}$$

where ix is the mean of any 10 consecutive spectral lines in the subband.

3.3. Melody Part Analysis Based on Auditory Saliency. The TANN network is used to identify multiple subbands with obvious auditory salience as candidate semitones, forming a significant semitone complex structure; the semitone complex structure forms a time series with the change of time, forming a preliminary melody flow. Further, this paper introduces the prior knowledge derived from the generalized chord structure to standardize the chord-like structure at each moment in the candidate melody stream, and improves the accuracy of the melody stream's description of the original music. The result of as prior knowledge is fused with the candidate melody stream output by the TANN network to obtain the result of the final melody stream. The practice is shown in Figure 2.

The kernel function of SVM is the key factor of its classification effect. Generally, the Gaussian radial basis function can better describe the nonlinear relationship between categories and class attributes by nonlinearly mapping the feature space to the high-dimensional feature space. Linear connection, which can be used as a kernel function to obtain an ideal classification effect, but the computational cost is too high

$$K(x_i, x_j) = \exp\left(-\frac{(x_i - x_j)^2}{\sigma^2}\right). \tag{11}$$

First, the training and target input music signal to be classified is divided into frames, and the MFCC features and their first-order and second-order differences are extracted, and the SVM is trained with the preclassified two types of training data (pure music and human voice). Support vector with optimal classification hyperplane description. Suppose that there are L frames of input data to be classified, and use the trained SVM to obtain two classification results −1 (human voice) and +1 (music), as shown in the following:

$$W(t) \in \{-1,+1\}, t = 1, 2, 3, \cdots \cdots, L. \tag{12}$$

In the formula, t is the time expressed by the frame number.

Let the low-pass filtering result be LPw(t), then:

$$\mathrm{LPw}(t) = \frac{1}{2N+1}\left(\sum_{i=-N}^{N} w(t+i)\right). \tag{13}$$

In the formula, $N - N = 50$ is the value selected for our experiment.

Then the low-pass filtering results are divided into two categories to obtain the final classification result SLPw(t):

$$\mathrm{SLPw}(t) = \begin{cases} +1, \mathrm{LPw}(t) > 0, \\ -1, \mathrm{LPw}(t) < 0. \end{cases} \tag{14}$$

Next, we need to train the GMM model with style features. The characteristics of each musical style can be uniquely determined by the GMM probability density function with different parameter values, and this parameter group can be expressed as:

$$\lambda = \{w_i, \mu_i, \Sigma_i ; i = 1, 2, 3, \cdots, M\}. \tag{15}$$

where $i\sum$ is the diagonal covariance matrix, $i\mu$ is the total number of feature vectors contained in the song used to identify the song, wi is the mixed weight of the i-th single Gaussian component, and M is the mixture number of Gaussian components.

In the training process, the parameter λ corresponding to a specific music style model needs to be estimated, and the expectation maximization algorithm (EM) is a classic algorithm for estimating the parameter λ, so we use the EM algorithm to estimate the parameters of the style category GMM model.

4. Experimental Results and Analysis

4.1. Data Analysis of Teaching Practice. The questionnaire survey of this study is mainly divided into two parts: the open-ended "subject unit academic ability level" test and the closed-ended "question survey." After the whole teaching

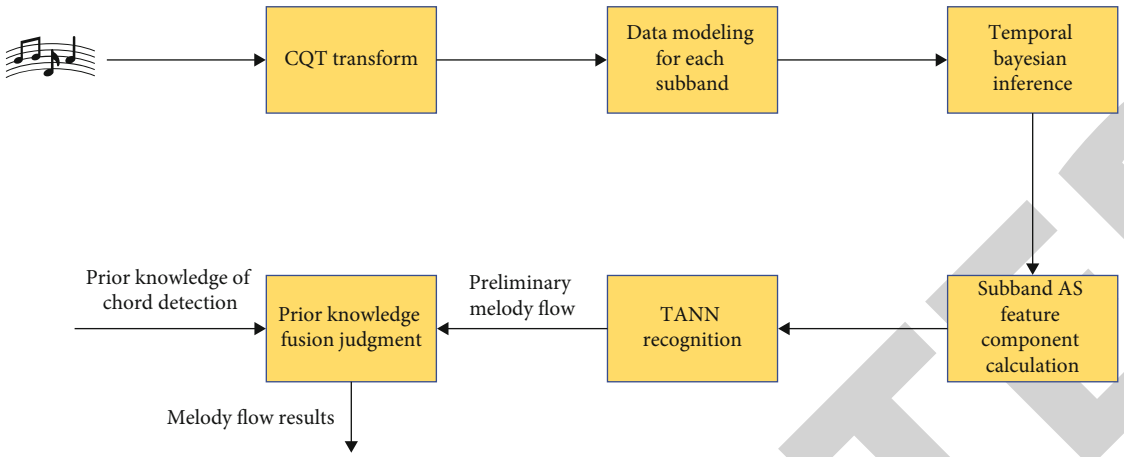

Figure 2: The algorithm flow of melody flow detection based on auditory saliency feature.

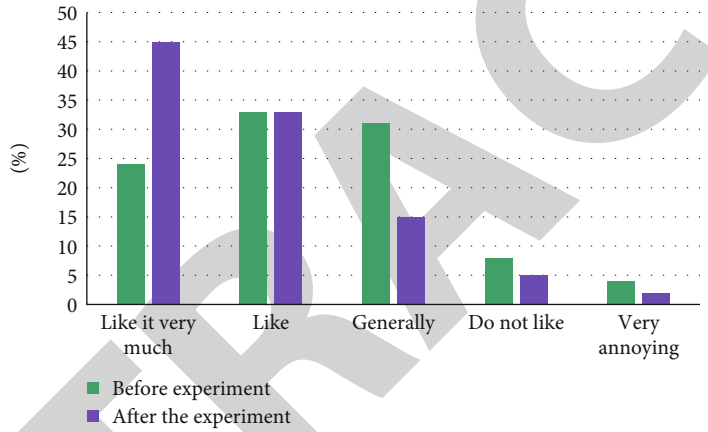

Figure 3: Proportion of options for "Music Likeness" among the tested students.

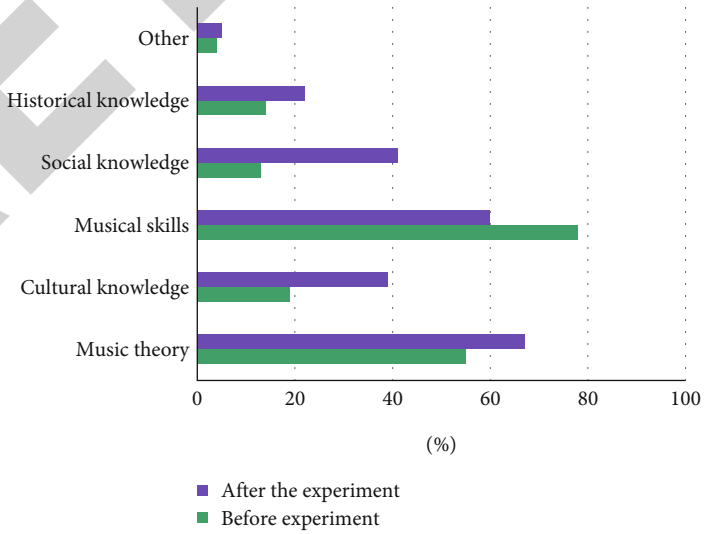

Figure 4: Proportion of options for students to choose "what knowledge should be learned in music study class".

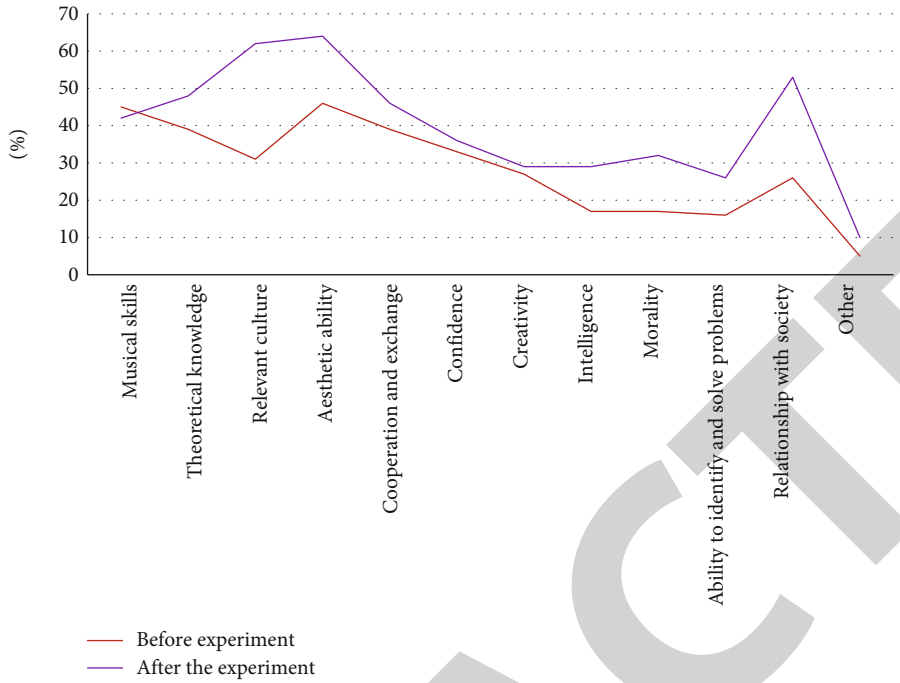

Figure 5: The proportion of students who chose the option of "Summary of Learning Gains from Music Lessons".

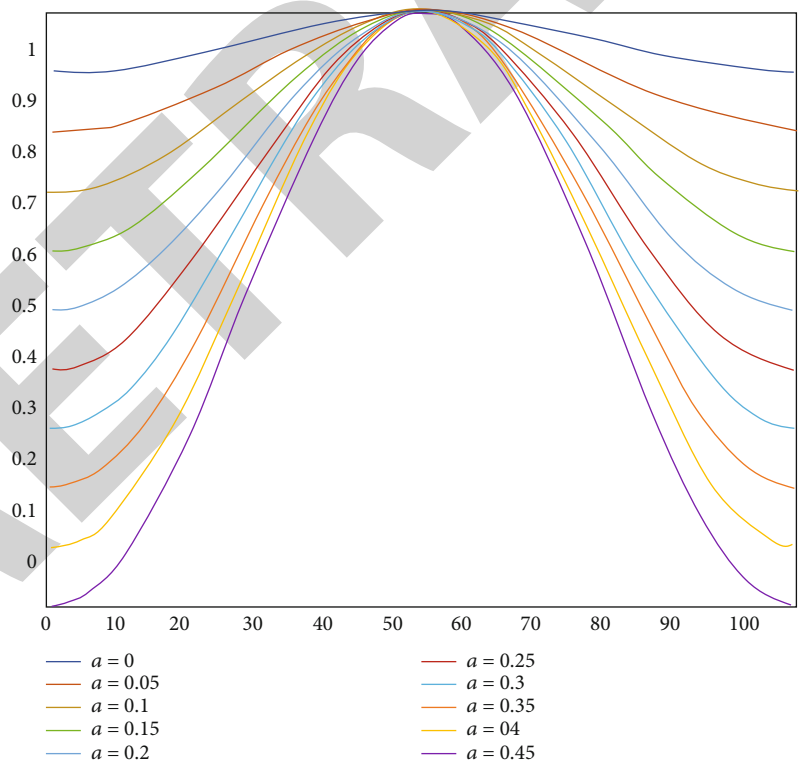

Figure 6: Comparison of classification results based on three features.

practice, the author input the questionnaire data before and after the practice into the data analysis software to conduct data statistics and analysis. The main results are as follows.

(1) Comparison of changes in the learning attitude dimension of teaching objects before and after practice

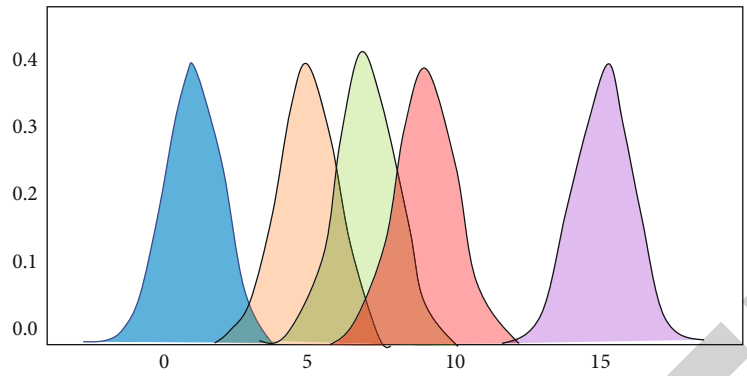

Figure 7: Classification results of three features with different Gaussian mixture numbers.

As can be seen from Figure 3, before the teaching practice, the students' preference for music showed a half-like and half-neutral (including dislike) attitude. In the process of communicating with them, the author observed that more students can show a strong love for music, and believe that music can bring them a good mood. Usually, they also like to increase their music experience through other means, such as watching music, TV, Internet, and music APP to obtain music experience outside the school music class. These students generally believe that music is an indispensable part of life, and some students say that if there is no music, life will become colorless. Another part of the students think that music is not an important subject to study, and the practicality of music lessons is not high. Therefore, they think that music is not very important to them, and therefore, they also show a more neutral attitude towards music. After the teaching experiment, the students who "disliked" music decreased, and the degree of "like" music was significantly improved. After the experiment, the students who held a "very much like" attitude towards music lessons were compared. There was a 21% increase before the experiment.

(2) Dimensional comparison of the changes in the understanding of the teaching objects in the music learning results before and after the teaching practice

As can be seen from Figure 4, before the teaching practice, most students generally pay attention to the learning and mastery of music knowledge and music skills in music classes, while most of them think that other knowledge other than music is unimportant and irrelevant. Although the understanding of music has increased significantly, but at the same time, the learning awareness of other related knowledge other than the basic knowledge and skills of music has also been significantly changed and improved.

As shown in Figure 5, the tested students have more learning gains after the completion of the "Rhythm in Music" learning unit using "Reverse Music Teaching Design Based on Big Concepts," especially for music learning and society. The most obvious gains are in the understanding of the relationship with nature. It can be seen that the teaching goal of this teaching practice unit to gain insight into the "order" and "cycle" in social and natural life through "rhythm" has been well achieved.

4.2. Experiments Related to Style Analysis. The horizontal axis in Figure 6 represents various musical styles, while avg represents the average recognition rate of all styles, and the vertical axis represents the recognition rate value. It can be seen here that Figure 6 shows that MFCC and LPCC not only represent the sound quality characteristics of music, but their statistical extraction methods also make the characteristics themselves contain some information about the music rhythm characteristics.

The mixing number of the GMM used in the above experiments is 16. This paper further calculates the influence of the Gaussian mixture numbers of 4, 8, 32, and 64 on the style classification results, as shown in Figure 7. As can be seen from Figure 7, when the Gaussian mixture number is low, the style model obtained by training cannot adequately capture the differences between styles.

5. Conclusion

With the development of computer technology and the progress of education concept in China, the application of multimedia teaching has become one of the common teaching methods in the education industry. However, with the development of multimedia application in the teaching process, some problems have emerged. In order to solve these problems and make the multimedia form better serve music teaching, it is necessary to study corresponding problem-solving methods and countermeasures, improve the efficiency of classroom teaching, and optimize the learning environment. This paper deeply analyzes the role and position of multimedia in music teaching in primary and secondary school music classroom teaching, compares multimedia technology with other educational technology means, and explains the advantages and limitations of music classroom teaching under the assistance of multimedia educational technology means. At the same time, this paper turns the cognitive problem of selective attention into the problem of measuring the auditory attractiveness of objectively existing music parts. The specific process is as follows:

first, on the CQT spectrum of real music audio, this paper uses the auditory cognitive model based on auditory saliency, and uses the Bayesian inference mechanism of time series to propose the calculation method of quantitative features of auditory saliency. Then, TANN network is used to identify multiple auditory significant subbands as candidate semitones, and a priori knowledge obtained from the generalized chord structure is introduced to standardize the chord like structure at each time in the candidate melody stream, which improves the accuracy of the melody stream's description of the original music. Finally, according to the data analysis of teaching practice, the teaching objectives of "order" and "circulation" in social and natural life have been well realized through "rhythm" insight in this teaching practice unit. How to show the advantages of multimedia technology and how to correctly use multimedia to carry out teaching mode in music classroom teaching also require further research and exploration by music educators and researchers in the process of practice.

Data Availability

The figures used to support the findings of this study are included in the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

The authors would like to show sincere thanks to those techniques who have contributed to this research.

References

[1] D. A. Grler, "A review of research in the field of music teaching," *Elektronik Sosyal Bilimler Dergisi*, vol. 88, no. 8, pp. 1338–1353, 2021.

[2] J. Ma, "Russian music education concept and its enlightenment to Chinese music teaching," *Arts Studies and Criticism*, vol. 3, no. 1, pp. 102–105, 2022.

[3] C. J. Sisson, "Culturally responsive teaching as a method for teaching students with emotional/behavioral disorders in the music classroom," *Update Applications of Research in Music Education*, vol. 96, no. 4, pp. 668–696, 2021.

[4] N. Bakhodirova, "The technology of teaching speaking in English at secondary schools," *ACADEMICIA An International Multidisciplinary Research Journal*, vol. 11, no. 2, pp. 271–274, 2021.

[5] E. Suhaimi, E. Atek, I. Hassan, M. N. Latiff, M. Hazli, and N. Jijidiana, "Popular approaches to the teaching of English literature among students in selected Malaysian secondary schools," *Journal of English Language and Literature*, vol. 9, no. 4, pp. 339–348, 2021.

[6] M. Maniam, S. Madya, and S. Ramanlingam, "Are English proverbs dying a slow death in Malaysian schools? A survey in primary and secondary schools in Klang Valley," *Muallim Journal of Social Science and Humanities*, vol. 24, no. 4, pp. 155–174, 2020.

[7] F. Thomas, "An assessment on the implementation of gis and remote sensing in teaching geography in Zimbabwean secondary schools," *Educational Technology*, vol. 16, no. 3, pp. 22–30, 2021.

[8] Y. Rani, "Use of technology in English language teaching and learning of secondary schools," *Paripex- Indian Journal of Research*, vol. 18, no. 3, pp. 294–304, 2020.

[9] S. Guo, "Strategies to improve the effectiveness of classroom teaching of morality and rule of law in primary schools," *Journal of Higher Education Research*, vol. 2, no. 5, pp. 553–556, 2021.

[10] S. Halidjah and R. Pranata, "Development of Indonesian language teaching materials based on Google classroom in primary schools," *Journal of Education Technology*, vol. 5, no. 2, pp. 3089–3092, 2021.

[11] J. Yang and Y. Qian, "Based on "MOOC + SPOC" customized regional primary and secondary school teachers' information technology application ability training strategy," *Journal of Physics: Conference Series*, vol. 1931, no. 1, article 012005, 2021.

[12] P. B. Tandika and L. G. Ndijuye, "Pre-primary teachers' preparedness in integrating information and communication technology in teaching and learning in Tanzania," *Information and Learning Sciences*, vol. 121, no. 1/2, pp. 79–94, 2019.

[13] N. Nasi, "Practices of inclusion/exclusion in and through classroom dialogue," *Language and Dialogue*, vol. 12, no. 2, pp. 306–331, 2022.

[14] A. M. Zain, S. Asimiran, A. B. Razali, and N. A. Ahmad, "The implementation of teaching supervision in excellence cluster secondary schools and daily secondary schools," *International Journal of Human Resource Studies*, vol. 11, no. 4S, pp. 1654–1664, 2021.

[15] T. A. Adebisi and S. T. Asaolu, "Assessment of outdoor educational activities in the teaching of basic science and technology in Junior Secondary Schools in Ekiti State Nigeria," *Sokoto Educational Review*, vol. 15, no. 4, pp. 1247–1256, 2020.

[16] P. Bakmohammadi and E. Noorzai, "Optimization of the design of the primary school classrooms in terms of energy and daylight performance considering occupants' thermal and visual comfort," *Energy Reports*, vol. 6, no. 11, pp. 1590–1607, 2020.

[17] F. Sang and Y. Xu, "Research on the current situation and improvement strategies of aesthetic education in music classrooms in primary and secondary schools in China," *Modern Economics and Management Forum*, vol. 3, no. 1, pp. 14–19, 2022.

[18] T. Liu, Z. Gao, and H. Guan, "Educational information system optimization for artificial intelligence teaching strategies," *Complexity*, vol. 2021, no. 3, Article ID 5588650, 13 pages, 2021.

[19] V. O. Falola and S. B. Jolayemi, "Impact of multimedia technology on the teaching and learning of oral English in Osun State Secondary Schools," *African Journal of Inter/Multidisciplinary Studies*, vol. 43, no. 4, pp. 311–329, 2020.

[20] Q. Zhao, "Research on English teaching transition between rural primary schools and secondary schools in light of computer multimedia technology," *Journal of Physics: Conference Series*, vol. 1578, no. 1, article 012143, 2020.

[21] H. Cheng, P. Ma, G. Dong, S. Zhang, J. Wei, and Q. Qin, "Characteristics of carboniferous volcanic reservoirs in Beisantai Oilfield, Junggar Basin," *Mathematical Problems in Engineering*, vol. 2022, Article ID 7800630, 10 pages, 2022.

[22] H. Cheng, J. Wei, and Z. Cheng, "Study on sedimentary facies and reservoir characteristics of Paleogene sandstone in Yingmaili Block, Tarim Basin," *Geofluids*, vol. 2022, Article ID 1445395, 14 pages, 2022.

[23] W. Zhang, Z. Cheng, H. Cheng, Q. Qin, and M. Wang, "Research of tight gas reservoir simulation technology," *In IOP Conference Series: Earth and Environmental Science*, vol. 804, 2021.