

Retraction

Retracted: Quality Analysis of Multimedia Teaching in Vocal Music Class Combining Elitist Teaching-Learning-Based Optimization Algorithm

Advances in Multimedia

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] H. Yang, "Quality Analysis of Multimedia Teaching in Vocal Music Class Combining Elitist Teaching-Learning-Based Optimization Algorithm," *Advances in Multimedia*, vol. 2021, Article ID 6594781, 8 pages, 2021.

Research Article

Quality Analysis of Multimedia Teaching in Vocal Music Class Combining Elitist Teaching-Learning-Based Optimization Algorithm

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With the social and economic development, there have been more and more abundant multimedia carriers. In this paper, based on the elitist teaching-learning-based optimization algorithm, the factors that affect the quality of teaching are analyzed mainly from the perspective of teachers in terms of the teaching philosophy, the design level of informatization teaching, the application of new teaching models, the evaluation of teaching effects, and other aspects. The quality of multimedia teaching in vocal music class is analyzed, aiming to improve the quality of teaching. The results of this study indicate that the proposed algorithm is effective.

1. Introduction

With the continuous development of Internet information technologies, many new forms of multimedia have emerged. Multimedia has begun to be applied in a number of fields, and the application of multimedia technology in classroom teaching at colleges and universities is also constantly deepening. Tremendous changes have occurred in traditional classrooms due to the integration of multimedia [1–4]. The so-called multimedia teaching refers to the ingenious application of multimedia technology by teachers in classroom teaching to present knowledge and ideas in a more intuitive and vivid fashion. It is conducive to enhancing the innovation and optimization of the overall teaching at colleges and universities and driving the quality improvement of teaching effectively [5–7].

How to evaluate the effects of the introduction of multimedia technology into classroom teaching has become an issue to be resolved urgently to improve teaching quality in many schools [5, 8–10]. Hence, the analysis of the quality of multimedia teaching mainly focuses on external factors such as the construction of an information environment and the teaching abilities of teachers. However, there are relatively few studies on the subject of teaching and learning. Many studies at present are carried out focusing on the

external factors that affect multimedia teaching; that is, the research content is not sufficiently comprehensive, and there are still some limitations [11–14].

In this paper, based on the elitist teaching-learning-based optimization algorithm, the main issues present in multimedia teaching at colleges and universities are explored from the perspective of both teachers and students, where not only the factors affecting multimedia teaching in the external environment are taken into full consideration, but also various internal factors are considered, for example, the capabilities of teachers in the utilization of information technology to design teaching, evaluation of their teaching effects, teaching philosophy, and so on. The factors that affect the quality of multimedia teaching are discussed, and the corresponding suggestions on how to improve the quality of multimedia teaching at colleges and universities are further put forward.

2. Elitist Teaching-Learning-Based Optimization Algorithm

2.1. Basic Teaching Optimization Algorithm. The so-called teaching optimization algorithm refers to the algorithm in which the population is regarded as a class, and the teacher is

regarded as the optimal individual in the class. The teacher organizes the students to carry out teaching activities with the purpose of increasing the mean score of the whole class and thus facilitating the search for the optimization and evolution of the population. In addition, with respect to the students in the class, they need to communicate and exchange with each other to enhance their understanding and absorption of knowledge, which can drive the further improvement of the performance of the whole class. It is assumed that the solution space of the problem is D -dimensional; then the teacher and students are candidate solutions for the problem at this time and the TLBO algorithm can be used to transform the optimization problem into a search process based on the D -dimensional space. The minimization problem of $\min f(x)$ is taken as an example. Firstly, the TLBO algorithm can be used to initialize and generate N individuals in the solution space randomly. Thus, these individuals constitute an evolutionary population, that is, a class. After the population is initialized and the maximum number of iterations is set, the iteration starts. The algorithm includes two stages as follows.

In the teaching stage, it is mainly to simulate the teaching process of teachers. Teachers are regarded as the optimal individuals of the population. As teachers, they are committed to improving the level of students continuously and helping them get closer to the level of the teachers, thereby improving the level of the whole class. Among them, I stands for the number of iterations. There are a total of n students in the class, T_i stands for the teacher, and M_i stands for the mean value. Combined with the above analysis, it can be known that the target of T is to make M as close to its own level as possible; that is, the new M_{new} should be as close to T_i as possible. The following equation shows the difference between the old and the new mean values:

$$\text{Difference_Mean}_i = r_i(M_{\text{new}} - T_f M_i). \quad (1)$$

In the previous equation, the value range for r_i is between 0 and 1, and the value is taken randomly. T_f stands for the teaching factor. Combined with (2), it can be known that the degree of change in the mean value is dependent on this value, as shown in the following equation:

$$T_f = \text{round}[1 + \text{rand}(0, 1)]. \quad (2)$$

At the teaching stage, the current solution is updated based on the following equation:

$$x_{\text{new},i} = x_{\text{old},i} + \text{Difference_Mean}_i. \quad (3)$$

If x_{new} is superior to x_{old} , then x_{new} is accepted; otherwise, it is discarded.

For the students, they generally make use of two methods to improve their own grades continuously: one method is to improve their grades through learning from the teacher in the teaching process; the second method is to communicate with other students to enhance their understanding and cognition of knowledge. The student stage is a process in which the students communicate with each other to improve their grades. It is assumed that what needs to be solved at this

point is the minimum problem, in which x and $f(x)$ are the independent variable and the objective function, respectively. The student stage can be described as follows. After the teaching stage, two students x_i and x_h are randomly selected from the class, and the respective objective function values of these two students are compared. If $f(x_i) < f(x_h)$, it indicates that the student x_i is superior to the other student at this time; that is, x_{new} is getting closer to x_i . On the contrary, it indicates that the student x_h is superior to the other student at this time. In this case, x_{new} is getting closer to x_h . The updated equations are shown as follows:

$$f(x_i) < f(x_h), x_{\text{new},i} = x_{\text{old},i} + \text{rand}_i(x_i - x_h), \quad (4)$$

$$f(x_h) < f(x_i), x_{\text{new},i} = x_{\text{old},i} + \text{rand}_i(x_h - x_i). \quad (5)$$

After the student stage, the fitness value of the new solution x_{new} is compared with the current solution x_{old} . If $f(x_{\text{new}}) < f(x_{\text{old}})$, then x_{new} is accepted; otherwise, it is discarded.

2.2. Elitist Teaching-Learning-Based Optimization Algorithm.

In the elite teaching optimization algorithm, the elite strategy is introduced into the TLBO. The optimal solution of each generation is retained. In addition, the inferior individuals will be replaced by elite ones during the iteration. Before the start of each iteration, the mutation mechanism will be randomly carried out on the elite individuals. Further, the repetitive ones will be deleted. In this way, those superior individuals can be retained in the later stage of the iteration, and the diversity of the population can be guaranteed effectively.

3. Advantages of Multimedia Teaching

- (1) Multimedia teaching is more vivid, intuitive, and abundant in forms.

Compared with the traditional teaching models, teaching based on multimedia technology can present knowledge more vividly and in a more organized fashion to convert profound knowledge that is difficult to understand into a more simple and easy-to-understand form, which is easy for students to understand and able to enhance the understanding of knowledge and information in the students.

- (2) Multimedia teaching allows the sharing level of teaching resources, which can facilitate richer teaching content, save the time of teachers spent in preparing for lessons, and improve their preparation efficiency.

Through multimedia, some knowledge that is difficult to express accurately through language can be presented in a more intuitive manner, which has enhanced the vividness and appeal of teaching and stimulated the interest of students in learning effectively. With the support of multimedia technology, the efficient transmission of information can be

implemented, which can enhance the communication between teachers and students and between students themselves, enrich the teaching content, strengthen the sharing of resources, and expand the learning horizon of the students.

- (3) Multimedia teaching can save the writing time on the blackboard and improve the teaching efficiency of teachers in class.

First of all, it will waste a lot of time for teachers to write down all the content that needs to be written or drawn on the blackboard in the teaching process. In this regard, multimedia teaching can be designed in advance to play the content through PPT and other forms. In this way, not only can the content be presented clearly and completely, but also it can save time for the teachers effectively and improve the efficiency of classroom teaching greatly.

Secondly, students can copy relevant materials by using a USB flash drive after class. Hence, they do not have to spend a lot of time and energy taking notes in class. Instead, they can concentrate on listening to the explanation of the teacher. In the traditional teaching model, as the duration of a class and the blackboard area are limited, it is often difficult for teachers to reserve sufficient time for students to take notes. In general, the students have to make use of the time that teachers require students to think about the questions to consolidate the notes they have written down, which has a certain impact on the classroom learning effects of students and is not conducive to the improvement of teaching quality.

4. Quality Analysis of Multimedia Teaching of Vocal Class

In this study, a certain provincial key university is taken as the research object, and the survey subjects are determined by the stratified sampling method. Among them, the sample size of students is 300–400, and the sample size of teachers is 150–200. The questionnaire survey of students is carried out mainly by means of distribution and recovery of questionnaire forms on site, whereas the questionnaire survey of teachers and teaching supervision experts is mainly carried out in the form of the combination of e-mail and on-site distribution and recovery. In the valid questionnaires recovered, a total of 367 questionnaires are recovered from students, 153 questionnaires are recovered from teachers, and 10 questionnaires are recovered from teaching supervision experts, with effective recovery rates of 89.4%, 90.7%, and 99.9%, respectively. Among them, the majors of the teachers participating in the survey cover 11 college disciplines except for military and medical disciplines. In the teachers, 51% of them have an academic background in education disciplines, and the rest of the teachers do not have an academic background in education disciplines. In the students participating in the survey, there are both undergraduates and graduate students, covering all grades in 23 secondary colleges of the university. Taking into consideration that freshmen have just been enrolled and have little exposure to courses, the students surveyed are mainly in Grades 2, 3, and 4. The proportions of students at various

levels from freshman to senior years are 8.5% (freshman), 26.9%, 31.8%, 18.2%, and 14.6% (graduate students), respectively. The teaching supervision experts are distributed in eight different disciplines. Among them, 70% do not have an academic background in education disciplines.

4.1. Selection of the Method for Multimedia Teaching. In this paper, investigations are carried out mainly from the following aspects: the utilization of multimedia, the selection of teaching approaches, the position of teachers, and the carrier of content.

- (1) No matter it is for teachers or for students, teaching based solely on multimedia is neither an appropriate way nor the optimal way. The results of the survey indicate that more than half of teachers and students are more inclined to the approach with multimedia teaching as the mainstay, supplemented by traditional teaching. The percentage of teachers who indicate their preference for traditional teaching combined with whiteboard writing using chalk is very small. However, it can be known from Figure 1 that some students still prefer the traditional teaching model, which suggests that although the multimedia teaching model has its unique advantage, the traditional teaching approach still has its irreplaceable utility.

In practice, many teachers still use blackboards and chalk in classroom teaching when they apply multimedia technology, as shown in Figure 2. However, the results indicate that 42.9% of the teachers indicate that they still use the blackboard occasionally; 4% of the teachers indicate that they almost never use the blackboard. This suggests that the teachers have a relatively high dependence on PPT, and effort in the integration of multimedia with the traditional teaching approach is not enough.

- (2) The survey results indicate that the awareness of teachers in the application of multimedia as a teaching resource still needs to be further enhanced. From the medium carried by teachers in multimedia teaching, it can be known that 75.7% of the teachers usually carry USB flash drives in their teaching. Among them, 42.8% of the teachers carry a USB flash drive and prepare PPT and related materials at the same time, while 31.7% of the teachers only use the USB flash drive to “prepare PPT courseware” and only less than 25% of the teachers bring their computers and resources to class. No teacher brings only electronic resources and does not use PPT in their teaching. Thus, it can be known that many teachers regard teaching as a process that can be preset through PPT courseware. In teaching practice, many students are more inclined to the teaching approach where the teacher has not only prepared PPT but also provided other related resources, and only 4.8% of the students indicate that they prefer the teaching model where the teacher “has electronic

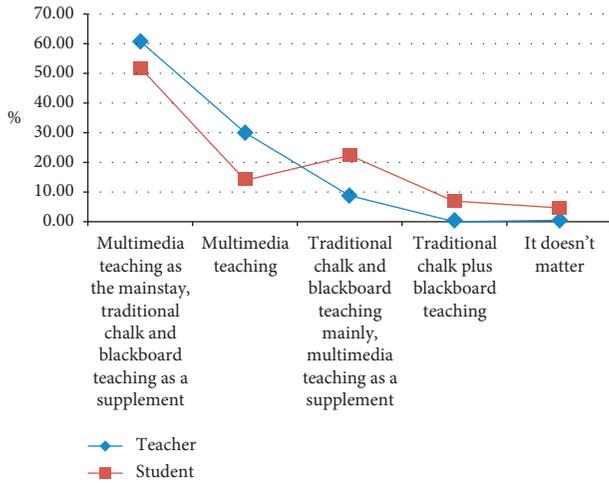


FIGURE 1: Comparison of teaching methods preferred by teachers and students.

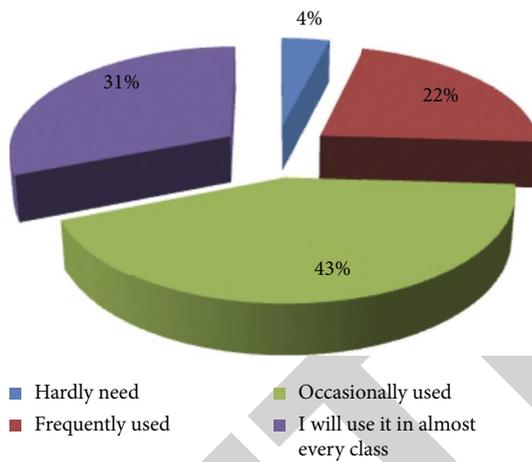


FIGURE 2: Frequency of using blackboards by teachers in multimedia teaching.

resources only but no PPT.” In addition, the survey results also suggest that the proportion of students who do not care about whether the teacher brings media resources accounts for 21.4%. The reason is that many students believe that it does not reflect the quality of the course teaching and that multimedia courseware does not have a significant effect on the quality of the course (as shown in Figure 3).

- (3) In the process of multimedia teaching, the position of the teacher can have a certain impact on the teaching effect. Both teachers and students prefer that the teachers do not stand in a fixed position but walk around as the case may be in the teaching process; 46.3% of the teachers choose this option, and 45% of the students choose this option. The second favorite model of both the teachers and students is that the teachers stand on the side of the podium and next to the multimedia console, followed by the model where the teachers stand in the

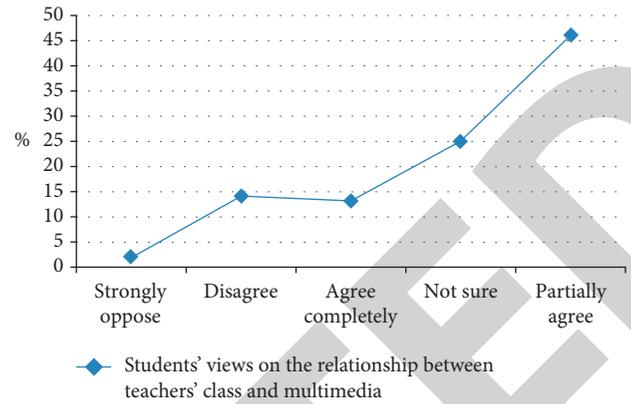


FIGURE 3: Students' views on the relationship between teacher's class and multimedia.

middle of the classroom. However, sitting next to the multimedia console is the least favorite way for both teachers and students. Only 7.3% of students choose this option, and only 5.8% of teachers choose this option. Hence, it can be known that the position of the teacher can affect the teaching effect.

- (4) Multimedia teaching approaches are not sufficiently abundant. In practical teaching, there are still relatively few teaching models based on new information technology. In the assessment of the informatization teaching capabilities of teachers, their application of teaching approaches is an important evaluation index. In this paper, investigations are carried out on three types of survey subjects, focusing on the common teaching models at colleges and universities. The survey results for teachers indicate that the “problem-based learning,” “explanation in class,” “discussion in class,” and “teaching based on case study” are the teaching methods that are applied “frequently” and “relatively frequently,” and more than half of the teachers have chosen these approaches. Among the five models, 42.8% of the teachers have selected “resource-based learning,” and the teachers who have selected the other four options account for about 20%. That is, the majority of the teachers apply these four models “occasionally.” In addition, 35.7% of the teachers said that they have never adopted “learning based on online platforms,” and the proportion of teachers who have selected the remaining four models account for about 20%. The results of the questionnaire survey for students and supervisory experts indicate that the proportion of teachers who have selected the other models has declined. According to the results of the above questionnaire survey, it can be known that in the classroom teaching based on multimedia, the most frequently applied teaching model is classroom explanation, followed by teaching based on case study and teaching based on resources. The other teaching models are used occasionally. Hence, it can be known that multimedia teaching has been

introduced in many colleges and universities, and it can be said that they have many years of experience in the application of this teaching approach. However, in teaching practice, the application of new teaching models such as teaching based on research and project is still rare and not very common.

4.2. Technical Capacity of Multimedia Teaching. In this paper, three small questionnaires are designed to investigate the technical capabilities of teachers in multimedia teaching. Overall speaking, with the continuous development of modern information technology and the continuous expansion of its application fields, the majority of teachers are able to deal with the issues they may encounter in regular multimedia teaching. When they are faced with some technical and equipment issues, 78.3% of the teachers indicate that they can solve the issues by themselves in most cases. Those who choose the option “seldom,” which means that they can hardly solve the issues by themselves account for only about 20%. In addition, when most teachers carry out multimedia teaching, 45.0% of them make use of self-prepared courseware, 44.6% of them integrate the existing courseware in their teaching, 7.0% of them choose “using the courseware developed by others directly,” and 3.0% of them choose other sources of courseware.

5. Design of Multimedia Teaching

The author has set up four questions to investigate the situation of multimedia instructional design by teachers, and the results obtained are shown as follows.

5.1. Comparison between Multimedia Teachers and Traditional Classroom Teaching Design Concepts. 90.2% of the teachers indicate that, in the design of multimedia teaching and traditional teaching, it is necessary to consider their characteristics, handle them in different ways, and be aware of their variations. However, there are still some teachers who have not taken the difference between the two types of subjects into account and cannot explain them clearly; with respect to the design of two types of curriculum *n*, 3.2% of the teachers indicate that there is no difference between them. This suggests that these teachers have not updated their teaching concepts to comply with the development requirements of the times, have not realized the uniqueness of multimedia teaching, and have yet to give full play to the advantages of multimedia teaching.

5.2. The Survey Results of the “Knowledge Sources and Applications” Item. The results indicate that once they encounter technical or other issues in the multimedia teaching design, the teachers often start from the perspective of time cost and convenience and are more inclined to check the materials and information through the Internet or consult their colleagues for advice directly. These two methods are the most common ways for them to address the issues. The reason is that the teachers think that these two methods are

more time-saving. However, there are still 5.7% of the teachers who think that they “have no time to deal with” such problems, and 1.1% of the teachers solve the problems in other ways. The method of acquiring information and resolving problems through books has fallen to second place (the details are shown in Figure 4).

Through further analysis and investigation, it can be observed that the proportion of teachers who think that pedagogy knowledge is useful in classroom teaching accounts for 17%. Hence, this part of teachers attaches great importance to pedagogy knowledge and focuses on improving their knowledge level. There are still many teachers (48.4%) who have recognized the importance of pedagogical knowledge, but they still “pay more attention to relevant knowledge occasionally when needed,” and 30.7% of the teachers indicate that they “have no time to pay attention to such knowledge.” In addition, the proportion of teachers who believe that pedagogy knowledge is not helpful in classroom teaching is very small, accounting for only 3.9%. As a result, they basically pay no attention to such knowledge. The results of the survey suggest that the research of some college teachers on the theoretical knowledge and practice related to education and teaching is not in depth enough and needs to be further enhanced.

Specifically, in the application practice, when teachers carry out multimedia teaching, they need to use a variety of knowledge and skills. Teachers often take the initiative to use the knowledge of educational technology or refer to the learning of multimedia teaching by excellent teachers as a basis or reference for their own classroom design of multimedia teaching. Teachers who select these two options account for a relatively large proportion, 45.7% and 23.1%, respectively. 18.8% of the teachers chose to design and reflect on classroom teaching based on their own experience when they design classroom teaching. Hence, it can be known that the two most important paths for teachers to acquire professional development are to design and reflect on classroom teaching based on their own experience and to observe and reflect on the teaching of other teachers.

With respect to the evaluation on the processing of teaching content, the results of the selection by teachers and students present high consistency, which suggests that the teachers should refer to multiple textbooks for an explanation first and then explain network and other resources or combine the teaching practice to adapt the designated teaching materials appropriately. At the same time, the results indicate that the teachers should expand the research content related to the curriculum appropriately to enrich the classroom teaching content further. Both teachers and students have presented a low level of recognition for the two methods of explaining based totally on designated teaching materials and based totally on their own subjects without referring to the designated teaching materials. It can be known that teaching materials play an essential role in the learning of students. However, it is not appropriate to be limited to one teaching material or referring to no teaching material at all, as shown in Figure 5.

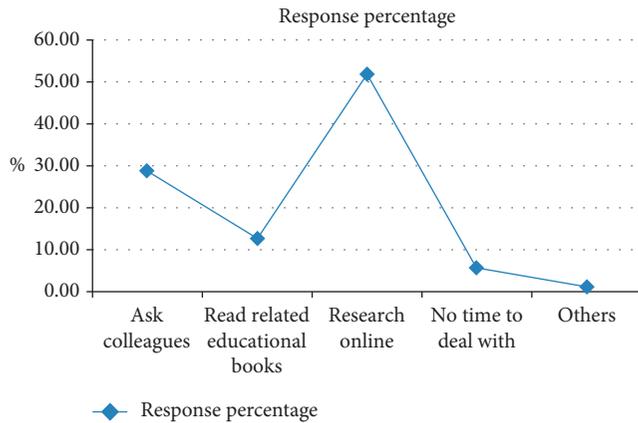


FIGURE 4: Solutions of teachers when encountering problems in the teaching design.

5.3. Self-Evaluation of the Teaching Design. In the investigation and analysis of this issue, most teachers have good self-evaluation on whether they can cope with multimedia teaching based on the teaching design and 98% of the teachers indicate that they can generally cope with the issue. Among them, 50.3% of the teachers have selected “able to cope in most cases,” and 32.7% of the teachers indicate that they can “cope with it in all cases.” Only 2% of the teachers think it is difficult for them to cope with the issue and they have no idea how to carry out teaching design.

However, in the survey of the teachers’ understanding of information-based teaching and related knowledge, the results are not so optimistic. Only 5.9% of the teachers indicate that they are very familiar with this type of knowledge, and the majority of teachers believe that they are familiar with this type of knowledge, accounting for 51.6%. 39.9% of the teachers indicate that they are “not familiar,” and 2.7% of the teachers have selected the option “very unfamiliar.”

It is also found in the survey that with respect to learning and training in this aspect, 56.8% of the teachers indicate that they have participated in relevant training more than once, but 43.1% of the teachers indicate they had never participated in such training. In addition, 85.0% of the teachers indicate that it is “necessary or highly necessary” to participate in such training. From the aforesaid results, it can be known that in the aspect of training related to multimedia teaching, there is still the issue that teachers have higher requirements to be met, and more training opportunities should be provided. It is also necessary to enhance the training of teachers at colleges and universities in their information teaching skills.

6. External Environment of Multimedia Teaching

In the survey on which external environmental factors can affect multimedia teaching, the results indicate that “unclear network connection” is an essential external introduction that affects teaching, and the proportion of teachers and students who select this option is the highest. Hence, it can

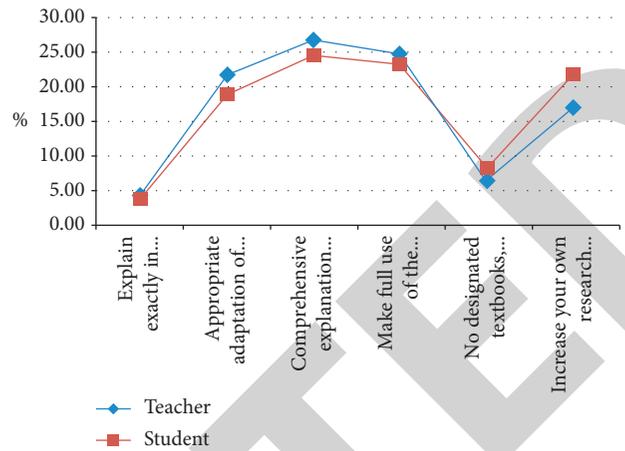


FIGURE 5: Comparison of the views of teachers and students on the sources of class content in multimedia teaching.

be known that the network construction level at many colleges and universities still needs to be further improved, and there are still severe problems of lagging behind. In addition, the other issues also include poor shading of curtains in the classroom, poor computer operation, and so on. 13.1% of the students indicate that the projection was “always” unclear, and 14.2% of the students said that the blackboard space was “always” insufficient. These two proportions are higher in the students than those in the teachers, accounting for 5.2% and 9.2%, respectively. This suggests that compared with teachers, students have higher requirements for projection clarity and sufficient blackboard space. At the same time, 12.4% of the teachers think that there are too many students in the classroom, whereas the proportion of students who have the same complaint accounts for only 6.3%, which indicates that teachers care more about this issue and have more intense requirement.

7. Evaluation of Multimedia Teaching Effect

7.1. The Teaching Effect as a Whole Needs to Be Further Improved. Compared with students, the overall satisfaction of teachers with the multimedia teaching effects is relatively higher, while the satisfaction of students is relatively lower. The analysis on the level of the mean value, and 55.9% are satisfied or very satisfied, and nearly 40% select the options “cannot tell” or “not satisfied.” They said that although multimedia teaching has become increasingly popular in colleges and universities, the teaching effect as a whole is still not ideal and needs to be further improved (as shown in Figure 6).

7.2. In the Evaluation of the Teaching Methods, the Overall Evaluation Is Relatively Low. In this paper, the multimedia teaching methods are evaluated mainly based on five dimensions. The results indicate that in the five dimensions, nearly 70% of the students are relatively satisfied with the “technical level,” and the satisfaction in this dimension is the highest; 60% of the students are satisfied with “curriculum content design and resource design,” whereas the

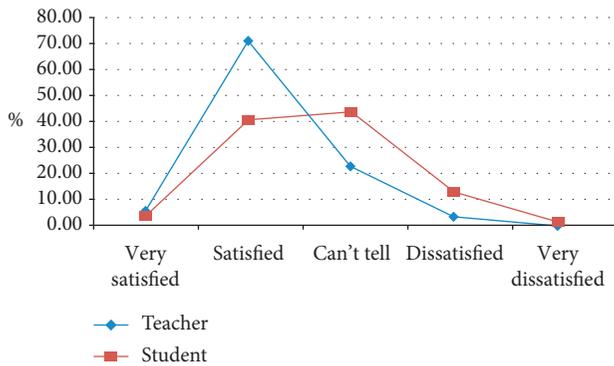


FIGURE 6: Evaluation of the satisfaction of teachers, students, and supervisory experts on the effect of multimedia teaching class.

satisfaction with “teaching method” and “teacher-student interaction” is relatively low, and the proportion of those with the evaluation of “not satisfied” in both aspects is the highest, accounting for 16.6% and 22.6%, respectively, with the level of dissatisfaction far higher than the other dimensions.

Through further analysis, it can be known that, firstly, although the students have the highest satisfaction when they evaluate the technical level of teachers, students still believe that few teachers can prepare nice multimedia courseware; only 40% and 59.4% of the students select the options “relatively many” or “basically all texts.” Secondly, with respect to the teaching methods of teachers, they are not diversified as a whole, and they are relatively single. Nearly 50% of the teachers explain the content in class by using the PPT. Thirdly, with respect to teacher-student interaction, more than half of the classrooms have occasional teacher-student interactions, accounting for 52.3%; only 7.6% of them always have interaction between the teacher and the students, and 5.7% of them never have any interaction.

In addition, it is also found in the survey that when teachers carry out multimedia teaching, the students pay attention to the teaching content and teaching methods first, followed by the relevant media resources and the language art of teachers. The respective proportions are 34.3%, 25.9%, 20.2%, and 12.5%, respectively. However, those who pay attention to PPT only account for 6.9%. This suggests that when teachers design classroom teaching based on multimedia, they need to focus on the teaching content and teaching methods rather than paying too much attention to the technical presentation of PPT.

7.3. Multimedia Classroom Is Not Necessarily Applicable to All Courses. For example, there is no need to apply multimedia teaching in advanced mathematics. With respect to the course types, among the most popular multimedia courses in the students, professional courses are the most popular, accounting for 44.1%, followed by public foreign languages, accounting for 30.5%, and then politics, accounting for 19.9%. Many students say that when a variety of media are used based on multimedia technology to carry out teaching, they can enhance the vividness and effectiveness of teaching,

and the interest of students in learning public courses has also significantly increased. At the same time, with respect to the most unpopular course types, 47.4% of the students select public politics, 28.6% of the students select professional courses, and 21.5% of the students select public foreign languages. Based on the above analysis, the evaluation of the multimedia courses is the highest among the students, while common courses have the lowest evaluation. With respect to multimedia classroom teaching of advanced mathematics, only a few students said that these courses were their “favorite” or “least favorite,” accounting for 5.4% and 2.5%, respectively. Hence, it can be known that based on the nature of the courses of higher mathematics, the application of multimedia technology does not have significant effect on the curriculum. According to the results of this survey, 60% of the supervisory indicate that not all courses are suitable for multimedia teaching.

8. Conclusions

In this paper, with regard to the current status of multimedia teaching platforms in colleges and universities in recent years, the quality of multimedia teaching in vocal music classrooms is analyzed based on the elitist teaching-learning-based optimization algorithm. The results indicate that the overall satisfaction of students is not high, and the comprehensive evaluation still needs to be further improved.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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