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Retraction

Retracted: Strategies for Improving the Quality of Music Teaching in Primary and Secondary Schools in the Context of Artificial Intelligence and Evaluation

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

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[1] Y. Bai, "Strategies for Improving the Quality of Music Teaching in Primary and Secondary Schools in the Context of Artificial Intelligence and Evaluation," *Security and Communication Networks*, vol. 2022, Article ID 4680905, 7 pages, 2022.

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Research Article

Strategies for Improving the Quality of Music Teaching in Primary and Secondary Schools in the Context of Artificial Intelligence and Evaluation

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With the advancement of society, we have entered the era of "artificial intelligence," with a plethora of sophisticated electronic devices infiltrating every aspect of our daily lives. People may work and study more conveniently with these sophisticated devices, dramatically increasing efficiency and saving time. When it comes to music instruction, there's no shortage of smart technologies to be found. This includes everything from advanced electronic musical instruments to sophisticated instructional software and mobile music apps. It is becoming increasingly difficult for youngsters to accept the traditional music instruction mode as they are exposed to and enjoy high-tech advancements. Many parents put their children into music training institutions to improve their children's after-school lives. When the emergence of new intelligent music teaching is a good solution to this problem, for this reason, this study explores the strategy and evaluation of music teaching quality improvement in primary and secondary schools based on the background of artificial intelligence. Therefore, those students who have just started to receive music education no longer feel monotonous and boring, and the indulgence mode of teaching makes students enjoy the fun and sense of achievement brought by music more when learning music, which can make more children enter the concentration state faster in the music initiation stage.

1. Introduction

Smartphones and tablet PCs are now found in millions of homes, thanks to the popularity of artificial intelligence devices [1]. With a wide range of software available in the application market to meet people's various needs, life seems to have reached a point where we cannot live without this software [2]. The most common ones are those that simulate musical instruments on the screen and make sounds by touching them, and these Apps can also connect smart electro-acoustic instruments through MIDI digital ports, turning smart mobile devices into a "game machine" that can compete with all users [3, 4]. Among them, there is the most number of analog Apps in the piano and drums categories. There is still a very broad space worth exploring for artificial intelligence to better serve the music so that the function is more perfect and becomes more and more humanized [5, 6].

Music has music artificial intelligence and music information technology department related to it; in other music colleges, basically, no such specialties can be seen in music artificial intelligence-related majors but still have great prospects for development [4, 7]. As a highly sophisticated cross-class professional, music artificial intelligence not only needs talents in music but also needs talents in electronic information technology, to have expertise in these two aspects to carry out relevant research and exploration [8]. In addition, electronic music majors are not available in all music schools [9]. The current trend of "independent musicians" is growing, and many music learners are composing, arranging, and performing all in one, which requires more use of electronic information technology to independently use various software and intelligent devices [10]. However, at present, nonelectronic music students want to learn this knowledge, but only through the network platform, looking for some only unprofessional video tutorials to learn, neither systematic, but also not comprehensive, often do not achieve the desired effect of learners [11]. Therefore, all music colleges should try to open relevant majors, which requires professional teachers to strengthen communication and cooperation, carry out relevant research, and continue to develop and innovate in the trend of the times [12, 13]. At the same time, music colleges should also introduce intelligent music devices and use them in teaching, not only always staying at the level of traditional teaching but also opening up their minds so that students can all receive education in electronic music; otherwise, they will not be able to keep up with the pace of the times [14, 15].

The intelligent teaching model emphasizes a diversified and developmental view of intelligence. If a student is relatively weak in math, but shows great interest in musical rhythm [16, 17], teachers should give her more guidance in music and adopt teaching methods that suit her characteristics to really help her build up her interest and confidence in learning. Discover more students' intelligence strengths, consciously pay attention to students' intelligence strengths, and carry out targeted teaching [18, 19]. From the teaching mode of intelligence theory, it analyzes and discusses the teaching strategies of music teaching and its practical application in the classroom, as well as the problems in practical application, and finally reflects on these problems. Then, apply the theory to teaching practice, cultivate students' perception of beauty and appreciation ability, enable students to establish correct aesthetic concepts, and form correct values and outlook on life [20, 21]. The development of students' thinking ability, artistic imagination, and understanding is the comprehensive development of students, so as to improve the effect of music teaching [22].

Whether it is intelligent electro-acoustic instruments, intelligent teaching systems, etc., all for music learners to practice and perform to achieve better results [14, 23]. I believe that, in the near future, artificial intelligence not only can solve more problems we encounter in the practice process but also can provide a boost to better performance results [24].

The organization paragraph is as follows. Section 2 reviews the creative applications of intelligent music teaching. Section 3 discusses the intelligent music system module design. Section 4 discusses the key implementation technologies. Section 5 expresses the experimental analysis. Section 6 concludes the study.

2. Creative Applications of Intelligent Music Teaching

In this section, we defined the use of the intelligent devices and novel teaching mode.

2.1. The Use of Intelligent Devices. After generations of electronic musical instruments have been updated, the accompanying intelligent electronic musical instruments have also come out. Its more powerful, more portable. and more convenient functions are accepted, applied, and promoted by more and more musicians. At the same time, many electronic musical instrument manufacturers in the market have also developed smart pianos with various styles and functions. These pianos can have their own recording programs and can automatically perform different styles of instrumental works according to the settings of different programs. These newest synthesizers have evolved over their predecessors in terms of sound quality, effects to play, sequencing capabilities, and the way they sound.

The more convenient and efficient programming function has replaced the previous complicated operation mode, and the new sequence function has also replaced the previous manual mode with automatic mode and even voice mode. These instrumental music can be found in the music teaching classrooms of primary and secondary schools, higher music education colleges and even various music education institutions emerging in the society. For example, such as instrumental ensemble, solfeggio, ear training, piano group teaching, music theory teaching. While improving students' understanding of musical elements, deepening and consolidating students' theoretical knowledge, it can also improve students' classroom learning ability, comprehension ability, adaptability and other aspects. It can be seen that the application of intelligent musical instruments does have great value and significance.

2.2. Novel Teaching Mode. The application of artificial intelligence in education has produced intelligent teaching systems at an early stage. The main form of the combination of artificial intelligence technology and education is the intelligent teaching system, which is the main research and development direction of teaching in the future, and is also one of the parts that this study focuses on. The rapid development of information technology and the proposal and continuous improvement of new teaching system development models have pushed people to develop new teaching systems by comprehensively using hypermedia technology, network foundation, and artificial intelligence technology. ITS is a typical representative. It includes domain model, learner model, and teacher model, which embodies the whole content of teaching system development. It can be said that it has incomparable advantages and great attraction.

The domain model is about the discipline of learning. The teacher model refers to an appropriate and effective teaching method. The learner model represents the students themselves, and this model shows the interaction of the computer or machine with the learner. This can be exploited by the teaching part of the AI system. In order to judge the course progress of the teacher and the learning progress of the learner, determine the most efficient, appropriate, and interesting teaching activities and interactions in the future.

The learner model can be compared to the students who want to learn the piano, the teacher model is the teacher or software that teaches the piano, and the domain model is the knowledge related to the piano subject. The algorithm of the intelligent system will analyze and process the content and information of these three parts and select the most appropriate content to transmit to the learners according to their learning needs and personal learning ability. Not only that, the continuous analysis of students' classroom performance is used to provide evaluation and effect feedback. For example, guidance or prompts can be provided to assist students' progress in learning with a continuous and stable effect.

3. Intelligent Music System Module Design

Through a certain algorithm, select the song of the composite scene; the portable audio distribution module has Wi-Fi modules on the audio, which is used to acquire song signals from the central nervous control system and play it out; the design module of the user sharing exchange website is castoff to resource operators to download their preferred songs. Messages can be shared and commented on by other users. The program's structural diagram is presented in Figure 1.

4. Key Implementation Technologies

The music feature recognition system based on IOT technology is mainly composed of a physical sensing layer, network transmission layer, and system application layer, and the overall system structure block diagram is shown in Figure 2.

4.1. Music Feature Identification. The music feature analysis module in the application layer of the system uses the Dynamic Time Warping (DTW) algorithm to identify music signal features:

$$S = \{S(1), S(2), S(m), S(M)\},$$
$$P = \{P(1), P(2), P(n), P(N)\}, \quad (1)$$
$$l[P(n), S(m)] = \frac{1}{k}\sum_{r=1}^{K}\left(H_r - H_r'\right)^2,$$

where H_r' and H_r denote the elements of S and P, respectively.

Assuming that the paths pass through the grid points $(n_1, m_1), \ldots, (n_i, m_i)$, (n_N, m_M), according to the endpoint constraint, the slope is chosen to be 0.5~2.5 to meet the slope constraint:

$$L[(n_i, m_i)] = l[T(n_i, R(m_i))] + L[(n_i - 1, m_i - 1)]. \quad (2)$$

Therefore, the result of music signal feature recognition [25, 26].

4.2. Music Melody Feature Extraction. The music melody generally includes two similar phrases, so we use the method of searching similar melodies to analyze the music structure and enhance the search efficiency and accuracy through the three-step identification method of preliminary identification, key identification, and supplementary identification, taking into account the rhythmic and harmonic characteristics of the music pattern:

(1) Preliminary identification according to rhythm and tonality initially divides the whole music according to rhythm and tonality characteristics to narrow down the scope, provide the basis for key identification, and increase the search efficiency [27]

(2) Focused identification by melody search

(3) Supplementary recognition based on harmonic features

Hypothesis 1. Sixteen bars form a phrase. This hypothesis is widely used in music structure research and has been tested to be correct.

Hypothesis 2. The focus of the phrase is the first 4 bars. This hypothesis uses a small number of notes to characterize the phrase, and the hypothesis is correct.

Hypothesis 3. The main theme is most likely to be played on the clarinet, violin, or flute. This theory promotes the quick search for the major melodic timbre and is required for melodic search focus identification.

Music can be extracted to musical tune features after the initial recognition and focus recognition, but there will be exceptions. Therefore, the search accuracy is improved by terminating a musical structure and the harmonic complementary recognition of the music structure of Roxy.

5. Experimental Analysis

Visual *C*++ was used to simulate the system prototype on Windows 2010 platform to verify the effectiveness of this study [28]. Figure 3 depicts the music signals gathered by the system sound sensor from three separate locations in a monitoring area. If you look at Figure 4, you will observe a smooth, uninterrupted signal curve that suggests that the system runs reliably and that it is collecting high-quality music signals. Table 1 displays the results of music feature recognition using the system described in this study, based on the signals presented in Figure 3.

Table 1 illustrates that this system is capable of correctly identifying musical and emotional features, with a recognition rate of 100% for musical features within the recognition range.

As shown in Figure 4, electro-acoustic instruments are connected to each other through MIDI digital ports [29], which are also called "scores that computers can understand." There are also apps that have the ability to correct intonation, detecting the intonation of an instrument by the vibration frequency of the sound. The advantage of these apps is that they make intonation correction a very easy task.

As shown in Figure 5, the song sharing and commenting module contains various categories of songs predefined by the system and contains a simple search function; users can upload and comment on music, as well as contribute their own. The data exchange between the Web side and the server side is done by HTTP passed, and then, the system array GT is used to extract it.

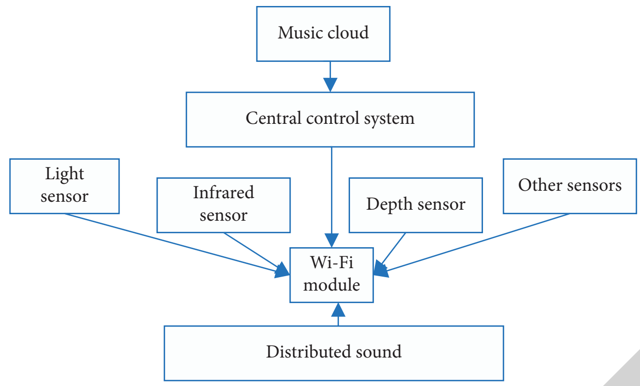

Figure 1: Intelligent music system.

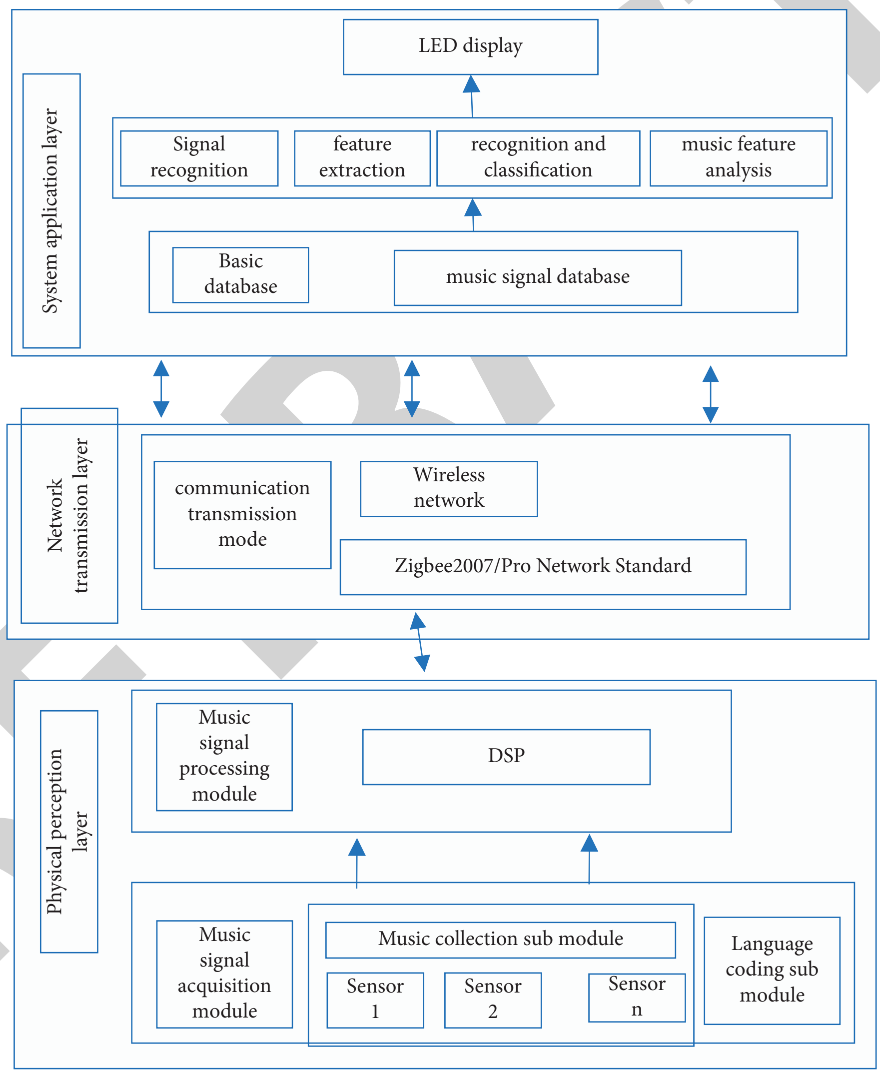

Figure 2: Block diagram of the overall system structure.

As shown in Figure 6, after the students are educated, the basic function of the Web of Things-based sound system is to select appropriate music, through Wi-Fi to the remote wireless speaker, so as to play the most acceptable background music for the user's mind, in order to improve the mood of the user and to improve the efficiency of the purpose.

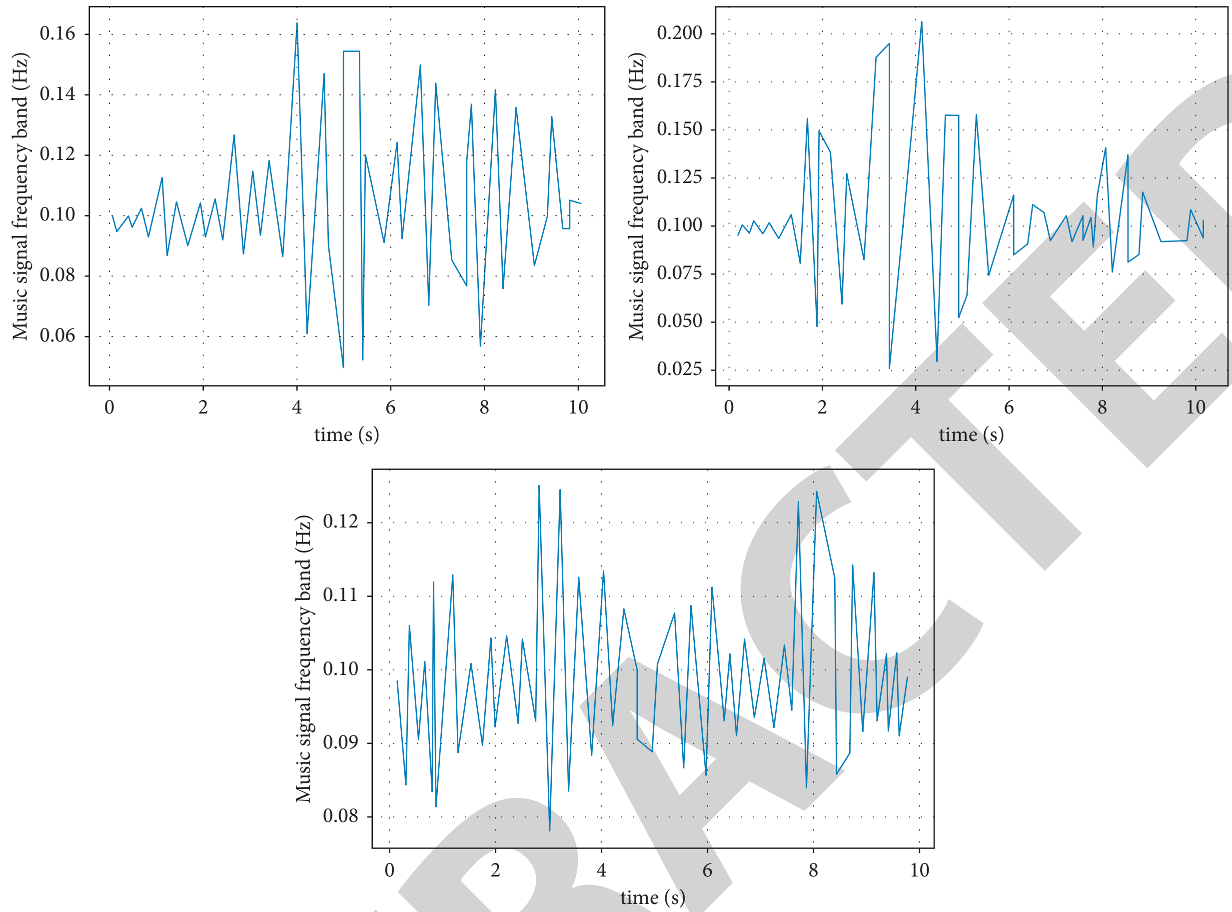

Figure 3: Music signal acquisition results.

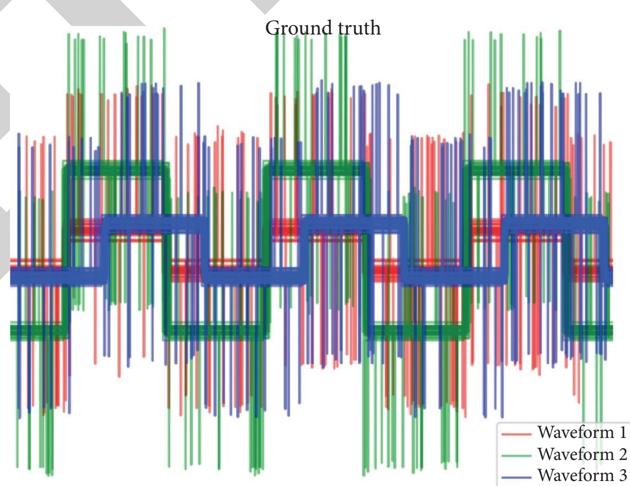

Figure 4: Curve of different music recognition.

Table 1: Music feature recognition results.

Location	Musical form features	Emotional features	Recognition accuracy (%)
1	A musical form	Solemn	98
2	Variation form	Enthusiastic	99
3	Rondo form	Lyrical	97

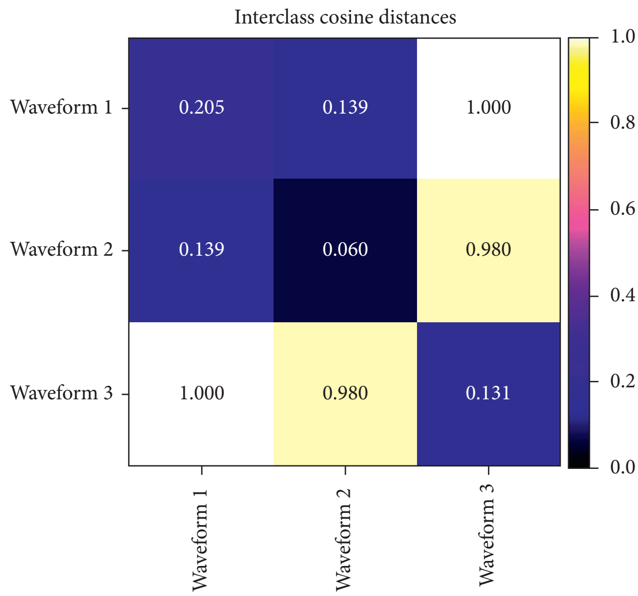

FIGURE 5: Different user evaluation matrix.

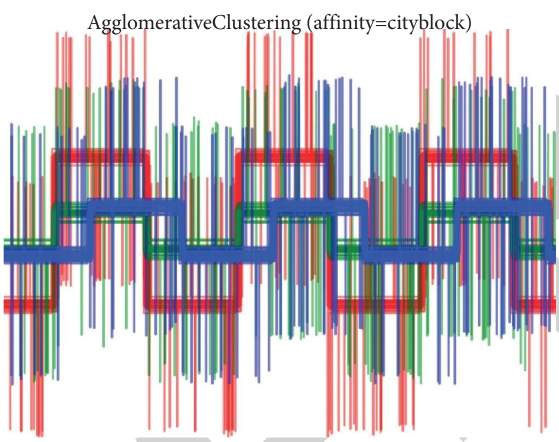

FIGURE 6: Identification effect of educated students.

6. Conclusion

With the development of society, we have entered the era of "artificial intelligence," and all kinds of intelligent electronic devices are flooding every corner of our lives. The era of artificial intelligence has come, and the interconnection of everything has become a major trend. Music, as an important art form essential to human life, plays a crucial part in enhancing people's spiritual worlds. At the same time that we reap the benefits of technological advancement, we must also strengthen our cross-disciplinary research in order to broaden our perspective and better "handle" technological advancement. This system was designed totally with artificial intelligence, and it adjusts not only to the characteristics of embedded systems with limited hardware and software resources but also to the characteristics of embedded systems with limited hardware and software resources.

Data Availability

The datasets used during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The author declares that he has no conflicts of interest.

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