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Retraction

Retracted: Intelligent Piano Teaching Based on Internet of Things Technology and Multimedia Technology

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] Y. Xu, "Intelligent Piano Teaching Based on Internet of Things Technology and Multimedia Technology," *Scientific Programming*, vol. 2022, Article ID 8774340, 9 pages, 2022.

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Research Article

Intelligent Piano Teaching Based on Internet of Things Technology and Multimedia Technology

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Intelligent piano teaching is based on traditional piano teaching, combined with relevant intelligent technology, to improve students' teaching methods, or to change the traditional piano structure, so that students can change from learning piano to playing piano. This study aimed to select a more suitable specific algorithm by studying the Internet of things (LOT) technology and multimedia technology and conduct in-depth research on the piano intelligent teaching, so that it can better serve the current piano teaching intelligence. Based on the experiment of this study, it can be seen that among the 600 investigators in place *O*, there are 587 valid questionnaires, of which 265 are willing to accept both traditional teaching and intelligent piano teaching, accounting for 45.1% of the valid questionnaires; 136 people are more willing to accept intelligent piano teaching, accounting for 23.2% of the valid questionnaires; 186 people are more willing to accept traditional piano teaching, accounting for 31.7% of the valid questionnaires. The experimental results of this study show that the research process of intelligent piano teaching based on LOT and multimedia technology is more effective than other methods of analyzing experimental data, and it is of great reference significance for the development of intelligent piano teaching.

1. Introduction

The development of the intelligent era has prompted the corresponding generation of media for information communication and sharing, which not only speeds up the speed of network communication but also improves the efficiency of the public to solve problems. The Internet of things is an important component of the information age. It can connect relevant information sharing channels and networks to realize the intercommunication between humans and machines in time and space. Multimedia technology is a human-computer interaction technology that integrates various kinds of information through computers. The objects involved are the products of computer technology, not just movies, TV, etc., and can be widely used in various fields of public life.

The research on intelligent piano teaching is an inevitable trend in the development of the Internet era. There are many scholars who analyze piano teaching, and many scholars study its intelligent teaching, but few scholars analyze it from the perspective of LOT technology and multimedia technology. Based on LOT and multimedia technology, this study analyzes the intelligent teaching of piano, explores the development of piano teaching in the Internet field, broadens the research methods in this direction, and provides a feasible method for the development of intelligent piano teaching, which has certain practical significance. The innovation of this study is that this study analyzes the intelligent teaching of piano based on the Internet of things technology and multimedia technology.

2. Related Work

Piano teaching is a relatively traditional and demanding teaching activity. The development of the intelligent era has prompted the development of piano teaching in the direction of intelligence. However, how to better carry out intelligent piano teaching has become an important research topic for many scholars. Zhang believes that the development of electronic technology is changing with

each passing day, and it is widely used in various fields. As a hobby with a wide audience, the tuning teaching of piano needs to keep up with the progress of the times [1]. Liu and Tsai's research pointed out that in teaching, in addition to traditional research and analysis, it can also intelligently recognize text through parallel projection and area expansion and at the same time deepen the research and analysis of teaching [2]. Gong et al. believe that the teaching system should be deeply optimized with the development of society, and the course content should be improved by combining intelligent remote multimedia, so that it can promote teachers to improve work efficiency and optimize the course system [3]. By studying the activation state of mirror neurons (MNs), Hou et al. determined that the activation state of MN will be more obvious when pianists are in the "enjoyment" mode. Through analysis, he believes that the reason for this phenomenon is not only arousing the audience's associative feelings but also the moderating effect of relevant sports knowledge [4]. Tan et al.'s research is to explore what is the main influence on the production of piano sound. Through careful observation of the players, it is found that the main reason for hearing the sound of the piano is the vibration of the soundboard, and through experiments, it is found that at high frequencies, the lid of the piano contributes the most to its sound transmission [5]. Since the audience of piano and its teaching is very wide, how to better carry out piano teaching is a hot topic for researchers. With the advent of the era of intelligence, the teaching of piano intelligence has gradually entered the public's attention, and researchers have emerged in an endless stream of research methods, but few scholars have combined Internet of things technology and multimedia technology to conduct research.

The Internet of things technology can use a variety of means to combine various information sensing devices with the network, while the multimedia technology processes various multimedia information through computers. Beyene et al. introduced NB-LOT technology, which can support extremely low power consumption and the use of low-cost devices under extreme conditions. Through experiments, he found that a good candidate for implementing NB-LOT technology is cloud wireless access network [6]. Sisavath and Yu believe that home security is very important. For this reason, he proposed a smart home design concept with the theme of "Internet of things is close to life, simple, and easy to use" and built an LOT-based smart home system [7]. Zhang et al.'s research discusses various LOT communication technologies, and based on NB-LOT, he proposes a NB-LOT-based urban lighting system design scheme. He emphasized the design of a single lamp control system and proposed the idea of combining smart lamp poles with 5G communication [8]. Wu et al. designed an interactive remote care system based on LOT technology, which enables direct communication between the patient's medical equipment and the caregiver's smartphone, thereby improving the quality of care for patients with chronic diseases, and confirmed the potential value of the system through experiments [9]. Chang et al. proposed a variety of ways to detect multimedia events, and the use of semantic representation is recognized by most of the public, but to make the content of semantic representation more accurate, several video archives are usually applied to event videos, and certain results have been achieved [10]. Since the Internet of things technology and multimedia technology are more commonly used information processing methods in the information age, there are many scholars who study them, but few scholars combine this method with piano intelligent teaching.

3. Intelligent Piano Teaching Method Based on Internet of Things Technology and Multimedia Technology

3.1. Intelligent Piano Teaching. The piano is a keyboard instrument in Western classical music. It is known as the "king of musical instruments." Modern pianos have become an essential instrument in music creation and auditory training due to their wide range and varied timbres [11]. Due to the continuous development and innovation of piano, the times are stable and peaceful, and people pay attention to spiritual enjoyment. Nowadays, more and more people take piano learning as a hobby. Therefore, piano teaching has become a popular trend [12]. Figure 1 is a display diagram of piano teaching.

Due to the advent of the Internet of things era, the traditional oral or face-to-face teaching methods can no longer meet the learning needs of the public, so the intelligent teaching method combined with the Internet of things technology and multimedia technology has become the current mainstream trend [13–15]. The intelligent teaching method is an important research field in contemporary education and teaching. With artificial intelligence technology, it can help students acquire piano skills without the guidance of human teachers, which is also a current research hotspot [16].

3.2. LOT Technology. The Internet of things technology is the extension of some related applications on the basis of Internet applications. After the function of the network, the connection between the Internet of things and the Internet is realized, which generally includes terminal facilities that can realize information exchange and communication [17]. The Internet of things technology mainly includes the following three types: sensor technology, RFID tags, and embedded system technology [18]. Figure 2 is a typical display of LOT technology.

In the field of LOT technology applications, matrix decomposition is often required, including methods such as k-means, which are generally unsupervised learning algorithms [19]. The k-means clustering algorithm is a commonly used clustering algorithm in intelligent learning. Its basic meaning is generally to divide the given data set $Q \in R^n$ into subsets $C_1, C_2, \cdots C_i$, where i refers to the number of clustering categories. The basic formula of the k-means algorithm is as follows:

Figure 1: Display of traditional piano teaching.

Figure 2: Typical LOT technology presentation.

$$\sum_{m=1}^{i}\sum_{j=1}^{k} a_{mj}\left\|q_j-\delta_m\right\|^2. \tag{1}$$

Among them, when q_j belongs to the C_m, $a_{mj}=1$; otherwise, $a_{mj}=0$; that is,

$$a_{mj}=\left\{\begin{array}{ll}1\text{C} & a_j\in C_m\\ 0, & \text{otherwise}\end{array}\right\}. \tag{2}$$

The decomposable proof of the k-means clustering algorithm is consistent with the proof of the objective function of k-means and can be decomposed into the following formula:

$$\sum_{m=1}^{i}\sum_{j=1}^{k} a_{mj}\left\|q_j-\delta_m\right\|^2=\|Q-NA\|^2. \tag{3}$$

Q is the sample matrix, each sample data are represented by one of the columns, and N is the aggregate class center matrix. Definition: each column of the sample matrix Q is q_j, and the 2-norm of Q is defined as the sum of the squares of the lengths of all sample vectors, namely,

$$\begin{aligned}\|Q\|^2 &= \sum_{l,j} q_{lj}^2 = \sum_j \left\|q_j\right\|^2 = tr\left[Q^Z Q\right],\\ \sum_{m,j} a_{mj}\left\|q_j - \delta_m\right\|^2 &= \sum_{m,j} a_{mj} q_j^Z q_j - 2\sum_{m,j} a_{mj} q_j^Z \delta_m \\ &\quad + \sum_{m,j} a_{mj}\delta_m^Z \delta_m = Z_1 - 2Z_2 + Z_3.\end{aligned} \tag{4}$$

Z_1, Z_2, and Z_3 are simplified to get

$$\begin{aligned}Z_1 &= \sum_{m,j} a_{mj} q_j^Z q_j = tr\left[Q^Z Q\right],\\ Z_2 &= \sum_{m,j} a_{mj} q_j^Z \delta_m = tr\left[Q^Z NA\right],\\ Z_3 &= \sum_{m,j} a_{mj}\delta_m^Z \delta_m = \sum_m \left\|\delta_j\right\|^2 k_m.\end{aligned} \tag{5}$$

Among them, k_m represents the number of samples belonging to the mth class.

Expanding the right-hand side of the equation, we get

$$\|Q - NA\| = tr\left[(Q - NA)^Z (Q - NA)\right] = Z_4 - 2Z_5 + Z_6. \tag{6}$$

It can be seen that: $Z_4 = Z_1, Z_2 = Z_5$, so it is only necessary to prove $Z_3 = Z_6$, and the proof process is as follows:

$$Z_6 = tr\left[A^Z N^Z NA\right] = tr\left[N^Z NAA^Z\right]. \tag{7}$$

Further derivation can be obtained:

$$tr\left[N^Z NAA^Z\right] = \sum_m \left\|\delta_m\right\|^2 k_m. \tag{8}$$

Because AA^Z is a diagonal matrix, the proof result of $Z_3 = Z_6$ is valid, and the final equation to be proved is valid. It can be seen from the above process that k-means is a solution process that can be used for matrix decomposition. Moreover, in the clustering algorithm, many algorithms are designed on the basis of k-means, such as the K-nearest neighbor algorithm, all of which are based on the central judgment of the data to achieve clustering. From this, it can be concluded that similar algorithms based on the k-means clustering algorithm have the characteristics of matrix decomposition [20].

Before analyzing the feature learning of the clustering algorithm k-means, an evolutionary version of the k-means algorithm, spherical k-means, should be introduced. According to its definition, the algorithm uses cosine similarity instead of Euclidean distance to measure in the process of clustering, normalizes the sample points, and performs clustering after it is distributed to a sphere. This algorithm outperforms the traditional k-means clustering algorithm [21].

The spherical k-means algorithm satisfies the following formula:

$$\begin{aligned}&\underset{B,s}{\text{minimize}} \sum_m \left\|B_{sm} - q_m\right\|_2^2 \quad subject \quad to \left\|s_m\right\|_0 \\ &\quad \le 1, \forall m \quad \text{and} \left\|B_j\right\|_2 = 1, \forall j.\end{aligned} \tag{9}$$

Among them, B is the transformation matrix, and B_j represents the jth column of the transformation matrix, that is, the jth cluster center of k-means. S is the encoding of the feature vector. When the jth column of B is the closest to $q(m)$, the element corresponding to 2 is $\neq 0$, and the rest = 0. For example, to perform clustering processing on Q, $i = 5$ is set, and if the final result is that q_m is clustered into the third category, the encoding vector is $S = (0, 0.1, 0, 0)$. Among them, S can be considered as a new clustering feature obtained after learning. The process of feature extraction in the k-means clustering algorithm is the process of calculating S.

When a new sample set q is input to the algorithm, the formula is as follows:

$$S_{jm} = \begin{cases} B_j^{\perp} q_m, if\, j = \underset{l}{\text{argmax}}\left|B_j^{\perp} q_m\right| \\ 0, \quad \text{otherwise}. \end{cases} \tag{10}$$

Since the calculation data are distributed on the spherical surface, if the distance between the two points is the closest, this symbol indicates that the value is the largest. The feature expression process of spherical k-means algorithm is as follows.

Standardization is calculated as follows:

$$q = \frac{q - \text{mean}(q)}{\sqrt{\text{var}(q) + \varepsilon_{\text{norm}}}}. \tag{11}$$

Whitening is calculated as follows:

$$\begin{aligned}[V, B] &= \text{eig}(\text{cov}(q)); VBV^Z = \text{cov}(q),\\ q^{(m)} &= V\left(B + \varepsilon_{pca} I\right)^{-1/2} V^Z q^{(m)}, \forall m.\end{aligned} \tag{12}$$

Loop to convergence is calculated as follows:

$$\begin{aligned}S_{jm} &= \begin{cases} B_j^{\perp} q_m, if\, j = \underset{l}{\text{argmax}}\left|B_j^{\perp} q_m\right| \\ 0, \quad \text{otherwise} \end{cases},\\ B &= QS^{\perp} + B,\\ B_j &= \frac{B_j}{\left\|B_j\right\|_2, \forall j}.\end{aligned} \tag{13}$$

The specific algorithm flow is shown in Figure 3.

Similarly, when selecting data, several images can be randomly selected and arranged into a one-dimensional vector q_m, which is used as training data for 256-dimensional feature vector.

Among them, whitening is a relatively important preprocessing process, and its main function is to reduce the redundancy of data. Therefore, the data after whitening have a low correlation between features, and the features have the property of correlation variance [22]. The whitening processing methods include PCA whitening and ZCA whitening, in which fitting can be used for dimensionality reduction or de-correlation, and the latter is mainly used for de-correlation and can make the whitened data closer to the original input data [23].

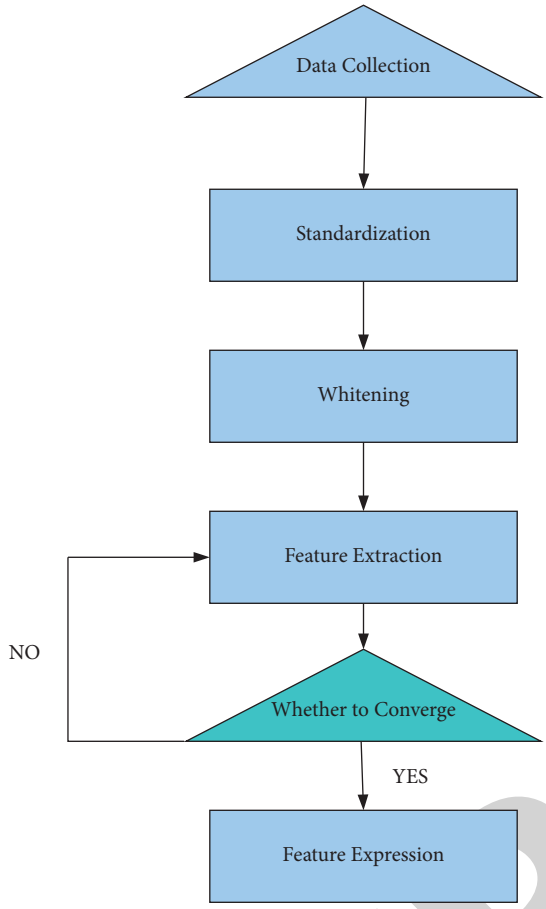

Figure 3: Feature expression flow of spherical k-means algorithm.

3.3. Multimedia Technology. Media refers to the medium that transmits or stores information, while multimedia refers to an information interaction method that combines text, image, sound, etc., and processes it through a computer [24]. Multimedia technology design data compression, processing, data retrieval, etc., have three characteristics of integration, interactivity, and real time, integrate the strengths of hundreds of schools, and successfully act on the daily life of ordinary people [25]. Due to the influence of multimedia technology itself, it will also be widely used in home systems, medical fields, and education and training in the future. Figure 4 is a display diagram of multimedia technology.

4. Piano Intelligent Teaching Experiment

4.1. Scheme Design of Piano Intelligent Teaching. As an indispensable musical instrument for musical plays that can be enjoyed by both refined and popular audiences, the number of people who want to learn and play the piano has been increasing. As a project to cultivate sentiment, piano teaching has become the signature specialty of many art institutions [26]. The needs of the public are increasing day by day, and the development of the times is also changing with each passing day. How to combine piano teaching with the development of modernization needs has become a hot spot for scholars to study. Therefore, under the development of Internet of things technology and multimedia technology, this study proposes to develop piano teaching in the direction of intelligence and improve the traditional teaching industry, to innovate the situation of piano teaching in the new era.

To better understand the relevant achievement data of intelligent piano teaching, and to further reveal the practical significance of the development of intelligent piano teaching in the Internet of things and multimedia to teachers and learners, this study distributes questionnaires to students majoring in piano in three chain brand art education institutions in O place. Among them, the students of R institution are the research objects of the experiment, and the students of S institution and T institution are the experimental control group, and a questionnaire is carried out. A total of 600 copies of the "Piano Intelligent Teaching Questionnaire" were distributed, and 200 copies were distributed to students majoring in piano in each institution. A total of 587 copies were recovered, of which 195 copies were recovered by institution R, 198 copies were recovered by institution S, and 194 copies were recovered by institution T, with an effective recovery rate of 97.8%.

In this experiment, the Internet of things technology and multimedia technology were used as the main experimental methods, and 600 questionnaires were distributed to students majoring in piano in three brand chain art education institutions in O place. The setting and analysis process of this questionnaire are fully combined with the clustering algorithm in the Internet of things and multimedia technology for analysis. In this questionnaire, 7 questions are set, and the sample data are analyzed in detail.

4.2. Discussion on the Results of Intelligent Piano Teaching. This questionnaire survey on intelligent piano teaching includes a total of 7 questions: (1) the gender of the student; (2) the length of time the student has studied piano; (3) whether you want to become a piano student in the future; (4) whether you like piano learning; (5) whether you understand intelligent piano teaching; (6) are you more willing to accept traditional piano teaching or intelligent piano teaching; and (7) the satisfaction with the current intelligent piano teaching.

4.2.1. Student Gender. According to the analysis process of the experiment, the gender of the respondents of the questionnaire is an important factor in the analysis of piano teaching, so it is very important to count the gender of the students. Table 1 is the gender statistics of the respondents.

It can be seen from Table 1 that among the piano students who conducted the questionnaire survey on the three brand art education institutions in O, there were 587 valid responses, among which 348 were women, accounting for 59.3% of the valid questionnaires, and 239 were men, accounting for 40.7% of the valid questionnaires. It can be seen that among the piano students in these three art education institutions, the proportion of women is higher than that of men. Of course, there are also a lot of men. From the side, women are more willing to learn piano than men. In the

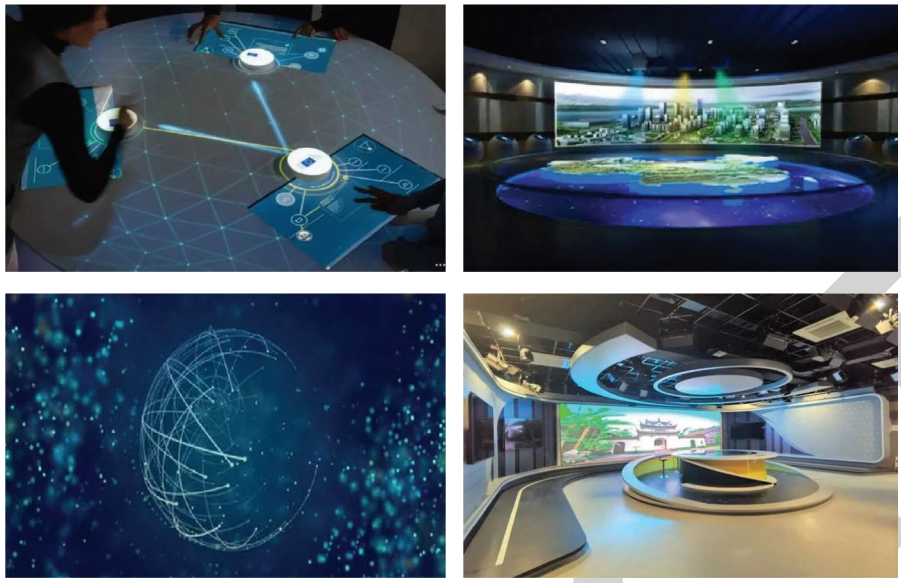

Figure 4: Multimedia technology display diagram.

Table 1: Student gender statistics.

	Female	Male
R	124	71
S	136	62
T	88	106

experimental group, there are 124 female students in *R* institution, accounting for about 21.1% of the valid questionnaires, and 71 male students, accounting for about 12.1% of the valid questionnaires; there are 136 female students in the *S* institution, accounting for about 23.2% of the valid questionnaires, and 62 male students, accounting for about 10.6% of the valid questionnaires; there are 88 female students in institution *T*, accounting for about 15% of the valid questionnaires, and 106 male students, accounting for about 18.1% of the valid questionnaires. It can be clearly seen from the above analysis that in this questionnaire, there are more female students in *R* institutions and *S* institutions, while there are more male students majoring in piano in *T* institutions.

4.2.2. The Length of Time Students Study Piano. Analyzing the length of time students study piano is conducive to a series of studies on piano teaching, the longer students study piano, the more thoroughly they understand the methods of piano teaching, which is more conducive to the research and analysis of intelligent piano teaching. Figure 5 is the statistics of the specific situation of the respondents' piano learning time.

According to Figure 5, among the 587 piano students who participated in the questionnaire, the students who have studied piano for 6–10 years are the most, with 170 students, accounting for about 29% of the valid questionnaires; secondly, there are 167 students with a study duration of less than 2 years, accounting for about 18.4% of the valid questionnaires; there are also more students with a study

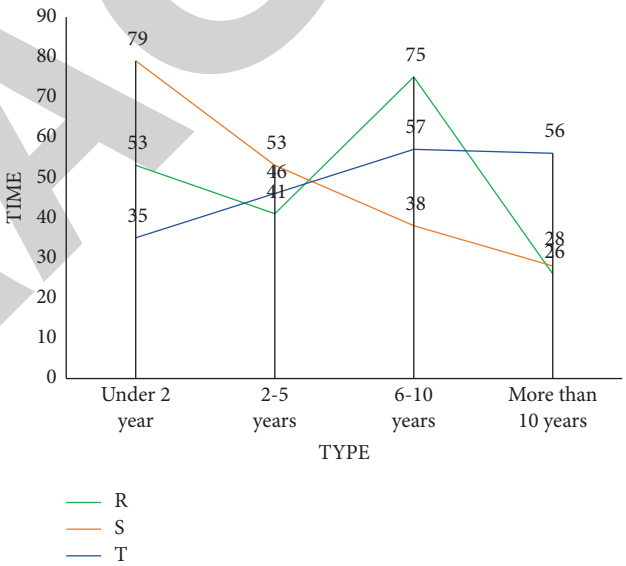

Figure 5: Duration of students learning piano.

duration of 2–5 years, with 140 students, accounting for about 23.9% of the valid questionnaires; the students who have studied for more than 10 years are the least, only 110, accounting for about 18.7% of the valid questionnaires. According to the analysis of relevant questionnaires, the number of people who studied piano in each time period is relatively large. On the one hand, it reflects that piano learning is the current trend. On the other hand, it reflects that the students who learn piano have more endurance and can persevere for a long time. This aspect reflects that the teachers of these institutions have high teaching ability and can attract students more.

4.2.3. Whether You Want to Become a Piano Student in the Future. Piano can be used as a personal hobby and specialty, or as a career development goal, to understand the students'

piano learning goals, and as a reference factor for the study of piano intelligent teaching. Table 2 shows the statistics of students who want to become piano majors in the future.

According to Table 2, most of the students still cultivate piano as a hobby. Therefore, the number of students who want to become piano majors in the future is relatively small. However, due to the in-depth understanding of the three institutions, the *R* institution is an institution specialized in cultivating art students, so the number of future piano students in this institution is the largest. *R* institution has 117 students who want to become piano majors in the future, accounting for 19.9% of the valid questionnaires, and 78 students who do not want to become piano majors, accounting for 13.3% of the valid questionnaires.

4.2.4. Whether You Like Piano Learning. Counting whether students like piano is conducive to analyzing the results of teachers' piano teaching and is of great help to the development of piano intelligent teaching. Figure 6 shows the statistics of whether the students in this questionnaire like piano learning.

There are two main situations for students to learn piano. One is that students are interested in piano learning spontaneously; the other is that they are influenced by external factors, such as parental pressure. 177 students in *T* institution prefer piano learning, accounting for 30.2% of the valid questionnaires, and 17 students do not like piano learning, accounting for 2.9% of the valid questionnaires; in the S institution, 126 people like piano learning, accounting for 21.5% of the valid questionnaires, and 72 people do not like piano learning, accounting for 12.3% of the valid questionnaires. Among the three institutions, the number of people who do not like piano learning is relatively high.

4.2.5. Whether You Understand Intelligent Piano Teaching. The ultimate purpose of this experiment is to study the intelligentization of piano teaching and to explore whether students understand the intelligent teaching of piano, which is conducive to promoting the process of obtaining the conclusions of this experiment. Figure 7 is the statistics on whether students understand the situation of intelligent piano teaching.

According to Figure 7, most of the students are relatively familiar with the intelligent teaching of piano, there are 382 students, accounting for 65.1% of the valid questionnaires, and a small number of students do not understand intelligent teaching; there are 205 students, accounting for 34.9% of the valid questionnaires. Combined with Question 6, it can be seen that students who understand the intelligent teaching of piano generally have received this teaching, and students who do not understand generally accept the traditional piano teaching method.

4.2.6. Are You More Willing to Accept Traditional Piano Teaching or Intelligent Piano Teaching. Intelligent piano teaching is a development trend in the age of intelligence, but whether students are more willing to accept traditional

Table 2: Whether you want to become a piano student in the future.

	Yes	No
R	117	78
S	76	122
T	58	136

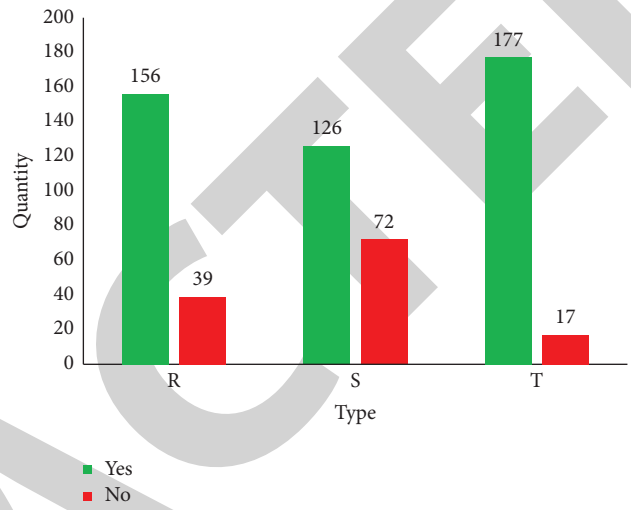

Figure 6: Statistics of whether the students like piano learning.

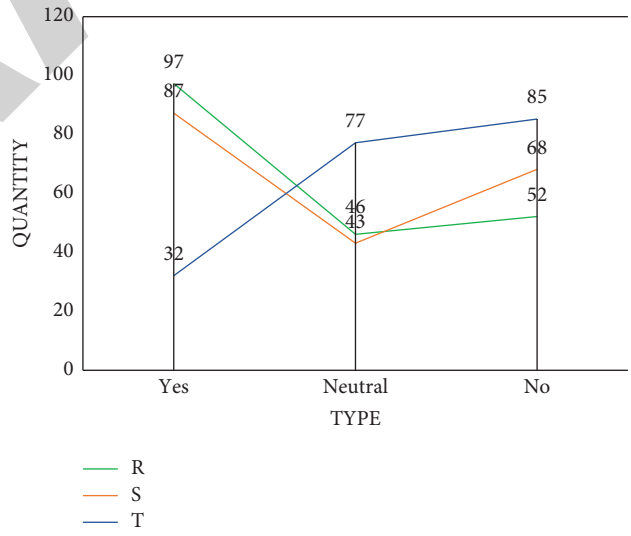

Figure 7: Statistics on whether students understand the situation of intelligent piano teaching.

or intelligent teaching methods is also an important focus of research in this experiment. Table 3 is the statistics for these students who are more willing to accept traditional piano teaching or intelligent piano teaching.

It can be seen from Table 3 that 265 people prefer both traditional piano teaching and intelligent piano teaching, accounting for 45.1% of the valid questionnaires; 136 people are more willing to accept intelligent piano teaching, accounting for 23.2% of the valid questionnaires; and 186 people are willing to accept traditional piano teaching,

Table 3: Are you more willing to accept traditional piano teaching or intelligent piano teaching.

	Traditional piano teaching	Intelligent piano teaching	Both
R	49	58	88
S	59	55	84
T	78	23	93

accounting for 31.7% of the valid questionnaires. According to the specific data in Table 3, combined with relevant analysis, it can be seen that intelligent piano teaching generally adopts video teaching, PPT teaching, etc., or uses more advanced intelligent piano for teaching, which can meet the individual needs of students to a greater extent and is extremely interesting. The traditional piano teaching is generally conducted in the form of face-to-face teaching, which requires a higher degree of concentration of students.

4.2.7. The Satisfaction with the Current Intelligent Piano Teaching. Statistical data about the students' satisfaction with the current piano intelligent teaching are conducive to further analysis of the piano intelligent teaching combined with the Internet of things technology and multimedia technology. Figure 8 is the statistics of the current students' satisfaction with piano intelligent teaching.

According to Figure 8, the number of people who are positive or neutral in their satisfaction with piano intelligent teaching is the largest, with 438 people, accounting for 74.6% of the valid questionnaires; the number of unsatisfied attitudes is relatively small, with 149 people, accounting for 25.4% of the valid questionnaires. Among them, the number of students in institution *R* who agree with the current intelligent piano teaching is the largest, with 105 students, accounting for 17.9% of the valid questionnaires; the number of students who disagree with institution *T* is the largest, with 66 students, accounting for 11.2% of the valid questionnaires. According to the research, satisfied students believe that intelligent teaching is more interesting, while dissatisfied students believe that traditional piano teaching is more detailed and can be supervised and guided by teachers, which is conducive to improving themselves.

4.3. Application of Networking Technology and Multimedia Technology to Intelligent Piano Teaching. Based on the above analysis, it can be seen that LOT and multimedia technology can be well combined with intelligent piano teaching. With the development of the information age, intelligent piano learning can be analyzed from multiple perspectives, and it can show the good development prospects of intelligent piano teaching in the LOT era. However, because the learning of LOT and multimedia technology is not deep enough, this experiment only conducted questionnaire analysis on students majoring in piano from three brand chain art education institutions in O place and did not conduct more detailed analysis on students from other majors in a certain institution or all students majoring in piano in only one institution.

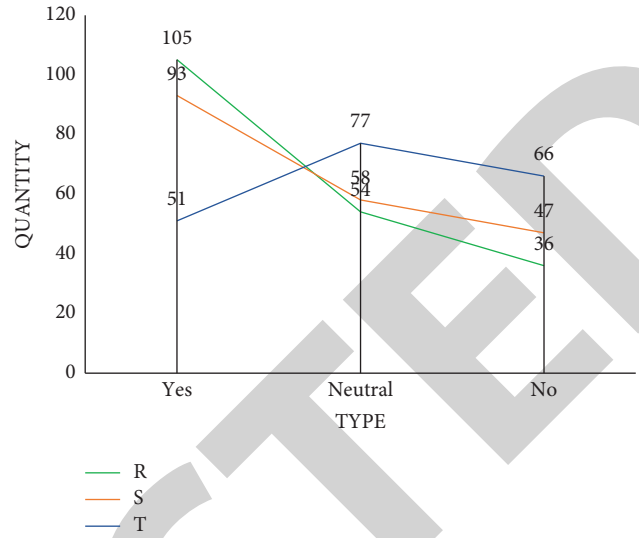

Figure 8: Satisfaction with the current intelligent piano teaching.

5. Discussion

This study is devoted to studying the related algorithms of LOT technology and multimedia technology and applying them to the research of intelligent piano teaching. This is not only the expansion of LOT technology and multimedia technology in the field of intelligent piano teaching but also a further exploration of the research on piano teaching in the field of Internet of things and a new attempt for the development of intelligent piano teaching. Through a questionnaire survey of 600 piano students from three brand art education institutions in O city, this paper analyzes their related feelings about piano intelligent teaching and explores the potential of LOT technology and multimedia technology in the analysis of piano intelligent teaching. In addition, on the basis of the existing LOT and multimedia technologies, the related algorithms are improved and integrated with the piano intelligent teaching, and practical conclusions are obtained.

Through the analysis of this case, we can see that the analysis method of piano intelligent teaching based on LOT technology and multimedia technology is more scientific than the traditional method. The surveyor used LOT multimedia technology to further discuss the development direction of intelligent piano teaching, optimized the algorithm in the specific experimental process, and finally obtained the best solution for this experiment.

6. Conclusions

Through the analysis of this case, the following conclusions can be drawn: the development of the Internet of things has made the world more integrated, allowing social development to further develop into the field of intelligence, so the combination of LOT technology and multimedia technology can better integrate it with the research on piano teaching and provide a great advantage for further analysis of piano intelligence research. In this study, through the questionnaire analysis of 600 piano students, the best plan for the

development of piano intelligent teaching is obtained. However, how to better develop intelligently in piano teaching and how to better meet the requirements of learners are questions worthy of constant discussion. Therefore, the intelligent teaching method of piano can achieve better development only by serving learners better and meeting the needs of learners.

Data Availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during this study.

Conflicts of Interest

The authors declare no conflicts of interest.

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