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Current Situation of Piano Education Network Teaching Based on Computer Information System

Yuhe Zhao*

Conservatory of Music, Northeast Normal University, Changchun, Jilin, 130000, China
**Corresponding author*

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Abstract: The emergence of network teaching is an innovative combination of traditional piano and modern high technology. There are many researches related to AI education in the curriculum, but few of them focus on the empirical research carried out in conventional teaching, and there is no in-depth research focused on learning participation in AI education. In the face of more and more students joining the piano learning team, piano education has also begun to adding some modern technological elements to meet the large-scale educational needs. The current survey on the status quo of piano teaching is generally inefficient. Therefore, this paper introduces the computer information system, designs the data acquisition system, and realizes the acquisition of the parameters. According to the characteristics of the parameters, the hardware modules of the system are introduced, and the successful simulation algorithm is implemented in the system. The company's system was used to gather and diagnose data on the current state of online teaching in piano education. The results of the test show that the efficiency of the approach has been significantly increased over traditional methods. The time required by the method in this paper was 4.75 min, 4.26 min, 5.12 min and 5.27 min for different groups of experiments, respectively.

1. Introduction

Based on the influencing factors of the learning participation of the AI module, this paper proposes specific strategies to improve and enhance the learning participation, guide the current teaching deficiencies, and deal with the problems in the teaching process of the AI module. The connotation of "AI teaching" includes two educational activities: "teachers teach AI knowledge" and "students learn AI knowledge". In teaching, students are taught AI knowledge to help and guide them to learn and master the basic concepts, principles, applications, of AI, meet their personalized learning needs and further education needs, cultivate their logical thinking ability, programming ability, and the ability to analyze and solve problems using AI technology, and cultivate new talents required by the country in the era of intelligent technology.

Liu M proposed an intelligent piano learning system based on neural network and studied the implementation method of this piano learning system. By studying the difficulties related to electronic piano teaching, he proposed a method to evaluate piano performance using a neural

network model [1]. Y Chen conducted a survey on the piano playing skills of teachers and students at a university. He discussed the situation of piano teaching in the university, he analysed and summarised the results of the study. This study expounds the reform and construction of online education for piano majors from three aspects, that is, to arm traditional classroom teaching in the form of "micro-class"; to build an online piano learning environment with new media as a medium; to establish a "MOOC" piano teaching platform [2]. Multimedia and network technology play an important role in piano teaching. Zhao P conducted an optimization modeling study on skill training in piano performance teaching. Multimedia technology makes the knowledge and skills of piano playing more vivid. Online forums have also become a place for everyone to learn, communicate and share learning resources. In piano practice, by practicing the rhythm and intensity, the performers can play a variety of different melodies, which will give people a strong shock [3]. Liu C analyzed the use of network resources in university piano teaching from the perspective of business education [4]. The computer information system is introduced in this paper.

At present, the main research results of computer information system are as follows. Matsushita T implemented an information processing device [5]. Quinzi D A examined the results obtained using a patient reported information system for computer adaptive testing. Surgeons trust their patients [6]. Liang W introduced virtual reality modelling language as a method. Combined with real case characteristics, he analysed the application of the virtual reality modelling language in virtual learning environments and provided concrete implementation methods. The Application of Virtual Reality Modelling Language in Online Learning summarised and analysed the functions, main features and development directions of virtual reality modelling language. This document discussed the theory and basic principles of online learning. It divided online teaching based on a virtual reality modelling language into two application modes. A learning model based on a virtual reality modelling language is proposed [7].

Packet loss rate of the system in this paper is 0.19%, 0.17% and 0.18% respectively, and the packet loss rate is stable at less than 0.5%. The system designed in this paper is very stable. To test the efficiency of this method and the traditional method, the time required by the traditional method is 56.24 min, 57.58 min, 57.16 min and 56.53 min respectively.

2. Method of the Current Situation of Piano Education Network Teaching

Many units are still weak in investment in network security construction, and various network failures caused by imperfect network security system occur from time to time. Community piano education is a piano education that relies on the community, based on the community and serves the community. The networking of community piano education is to apply network technology to community piano teaching [8].

The networked development of community piano education must be built on a mature community. A mature community needs a certain population size; there is a sound education system that can provide education from kindergarten to high school. It should also have sound medical equipment, such as community hospitals, community epidemic prevention stations, etc., which can provide general vaccinations and consultations for common diseases. It also needs to have basic living facilities, such as water, electricity, natural gas supply and sewage treatment facilities. With these basic community conditions, residents can have a higher pursuit of spiritual civilization, and community piano education can be developed [9].

Many educational products and services are also subdivided, covering the needs of people of all ages and levels. From pre-school education to continuing education, from online classes to homework tutoring, from examination and certification to art training, the products and services are very rich. Many smart pianos, piano teaching software, and distance piano education have gradually

entered the market [10]. The promotion of a new model is often accompanied by greater risks, and the founders must have a good mentality and abundant funds. Only in this way can we better deal with the contradictions and difficulties in the development of community piano education, a new thing [11]. As shown in Figure 1, various forms of piano education are networked.

Figure 1: Various forms of networking for piano education

The data includes musical scores, literature, video, audio and other aspects. Sharing means that learners can view more information through the network. Teacher sharing refers to the ability to watch the teaching content of teachers in other regions or other schools on the Internet without leaving home. For students with narrow learning circles, resource sharing enables them to listen to the lessons of many excellent teachers. For places where the level of piano teaching is relatively backward, resource sharing can expand the horizons and strengthen the exchange and interaction of learning [12]. Different teaching videos are aimed at different groups of people and provide teachers with different teaching methods. Some instructional videos are specially designed for children's enlightenment. Some are designed for intermediate level learners, while others are designed for professional learners who want to break through the technical essentials. These teaching videos designed for different groups of people also provide teachers with learning opportunities. While screening the teaching video content on the Internet, teachers can not only learn from the teaching methods of other teachers, but also learn by themselves, thereby improving their teaching level [13]. The networked teaching evaluation means that through some specific functions of the smart piano or some sparring software, the video or audio played by oneself is recorded and submitted to the teacher of the platform, and then the teacher will check, comment, and put forward practice suggestions. Some platforms are also equipped with intelligent detection equipment, but they can only detect pitch and rhythm, and cannot evaluate phrases, fingerings, touch strength, etc. Although this machine-checked system has certain limitations [14].

In order to accelerate the promotion of high-quality education, achieve educational equity, the integration of educational resources has become an inevitable choice. Especially for teachers, it brings three benefits. From the first point of view, they can obtain a large number of musical scores, audio and video materials without leaving home. Through the screening of online educational materials, we can better grasp the development trend of community piano teaching, fully learn new teaching concepts and methods, and then improve our teaching ability [15]. There are a large number of teaching and performance videos of famous lecturers and pianists in the online platform, and they are updated frequently. This allows educators to make continuous progress while reducing the cost of participating in teacher training abroad. At the same time, there are many teaching exchange platforms on the Internet, where teachers can communicate with each other to discuss educational models, share experiences, and learn from each other's strengths. In addition, many online information is also forward-looking. By mastering this information, teachers can predict the development trend of piano teaching [16]. The second point is to reduce the teaching burden of

teachers. There are a lot of people learning piano in the community, and the traditional one-to-one teaching mode makes the number of teachers who teach in a unit time very limited. Many contents need to be repeated, and the teaching burden is very heavy. However, if online piano education is used, similar online video teaching is provided for students with similar levels, so that common content can be explained in a unified manner. Common problems can be solved in a unified way, and finally, teachers are responsible for individualized treatment. The third is to establish convenient communication channels. Teachers can follow up the learning status of learners. On the contrary, the trainees can timely feedback their learning situation or the confusion they encounter through the network, which reduces the traditional waiting time for an appointment and improves the learning efficiency [17]. As shown in Figure 2, it is the system structure diagram of education network.

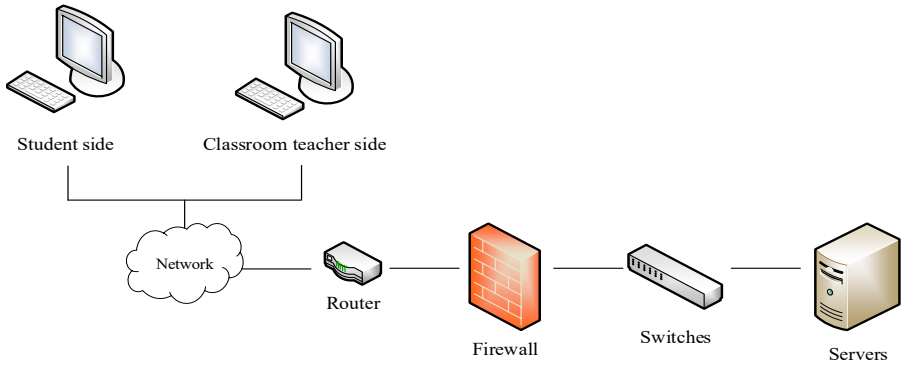


Figure 2: The system structure diagram of education networking

Because some smart products and networked teaching models have not appeared for a long time, and the publicity is not enough, some community residents do not even know the existence of smart pianos or online piano teaching. Therefore, it is easy to be hindered when promoting this new piano teaching mode, and it is difficult to be understood and accepted [18]. In the past 40 years, piano education in China has basically adopted the one-to-one teaching mode. Due to the accustomed to the teaching method of precepts and deeds, and in this way it has obtained good learning results. It is difficult for people to accept or recognize some new methods and ideas. Social consciousness is relatively independent. People often need a long adaptation process when accepting new things, so in recent years, it seems a little difficult to promote the network teaching mode in community piano education. On the other hand, learners are not necessarily able to adapt to the new teaching mode [19]. Many learners have years of piano learning experience before learning about these new products. In the learning process, they already have a fixed way of thinking and a fixed learning method. Even if they are willing to try these new things, it is difficult to guarantee that they can adapt to these new teaching modes.

In traditional piano teaching, teachers can teach according to different teaching content, teaching steps, teaching methods, etc. For the teaching content of the same course, different requirements and progress can be put forward for different students, and different teaching methods can be adopted. In the artistic expression of piano works, students can give full play to their personal charm. This superiority of teaching students in accordance with their aptitude is unmatched by other educational institutions [20].

In the process of building community piano education network, the shortage of funds is a more difficult problem. Therefore, the establishment of this new model of education schools often requires a large amount of funds as a premise. Nowadays, most of the community piano education schools are set up by individuals, and their financial strength is often weak, and their main purpose is to make profits. Therefore, in the process of establishing a school, the school founders are

reluctant to try new school-running models.

Generally speaking, when a distributed computer information collection system achieves load balance, the work intensity on each collection sub-node is equal. That is, as far as possible, the number assigned to each collection sub-node is equal. If a website is frequently collected, the collection sub-nodes will be prohibited from collecting its in-site information by the website in the subsequent collection process. Therefore, such a factor needs to be considered when designing a scheduling strategy. A more reasonable design solution is to divide the information with the same host name to the same collection sub-node. That is, all information in the same site is divided into the same collection sub-node. Figure 3 shows the structure of the computer information acquisition system.

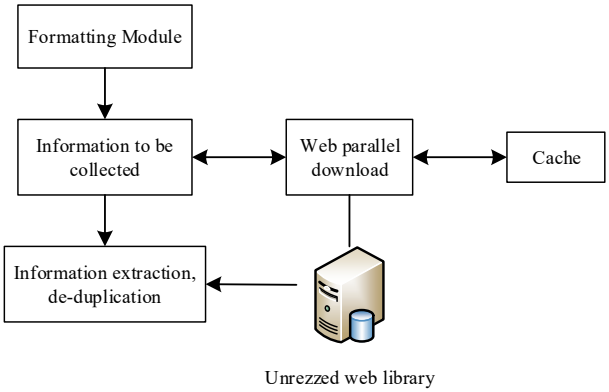


Figure 3: Computerized Information Acquisition System Architecture

The extremely important characteristics of the collection capability that the information collection system should meet are: (1) Distributed architecture: with cluster parallel, multi-threaded web page collection capabilities; (2) Cluster scalability: collection nodes can dynamically join and exit. (3) Configurable: The acquisition system can be configured for different acquisition task requirements. It includes supporting the collection of limited sites, setting the number of nodes for parallel collection, the local directory where the original web page is saved, and whether to re-collect or not. (4) Robustness: the failure of a single node in the cluster does not affect the stability of the system operation and continues to run for a long time.

Due to the extensive use of the network by colleges and universities, these bad information is widely spread in the network of colleges and universities. These bad information will have a negative impact on the physical and mental growth of college students. Among them, illegal bad information, such as reactionary information in the ideological field, will even affect college students' cognition, bringing great hidden dangers to college network security. The reason for the wide spread of bad information is on the one hand that some people keep publishing such bad information in their own interests, on the other hand that college students have not yet formed a fixed value and world outlook, and at the same time, they are at the age of high curiosity. In the face of the temptation and deception of bad information, individual college students have insufficient identification ability and resistance, are vulnerable to the impact of bad information, and also cause the spread of bad information. Colleges should strengthen the monitoring of campus traffic and public opinion, capture and block the spread of bad information in a timely manner, and also strengthen the psychological education of college students, establish a correct value orientation, and guide college students to correctly face bad information.

3. Experiment of the Current Situation of Piano Education Network Teaching

Function of the formatting function module is to convert the format into a unified format for

saving each information in the web page information collection system. Using a unified data structure to save each corresponding information, so that the data connection between each functional module in the program is convenient. There is no need for format conversion, as shown in Figure 4 for the format function module.

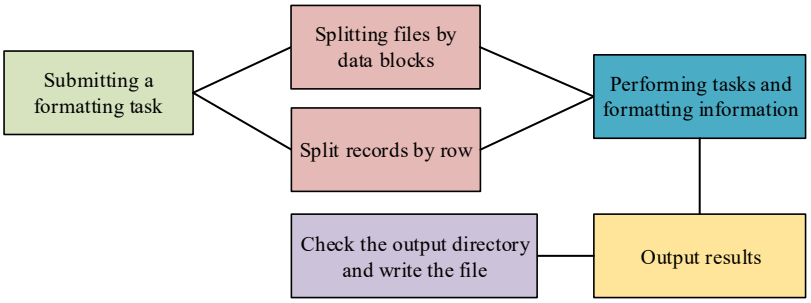


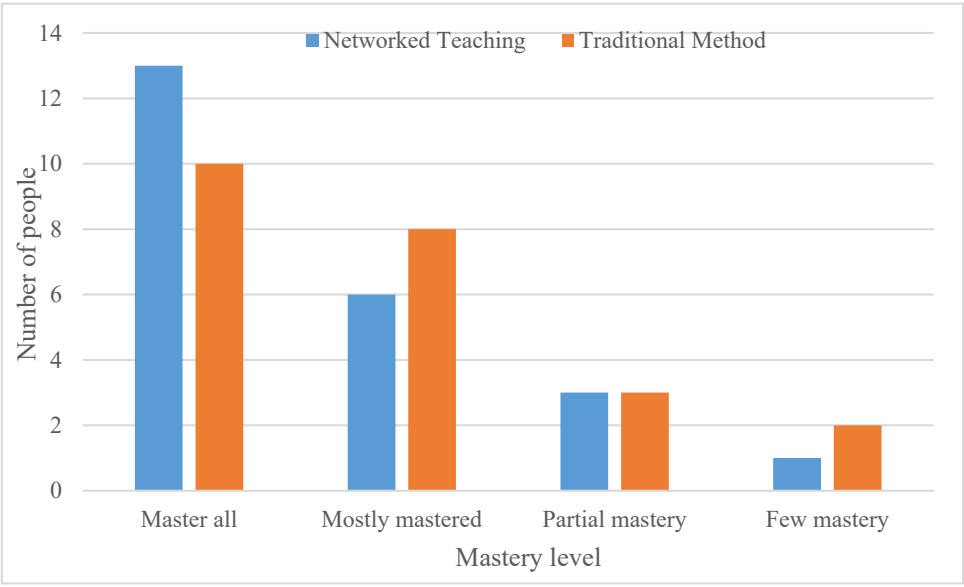
Figure 4: Formatting Function Module

The computer information acquisition information system designed in this paper is tested, and the test results are shown in Table 1. Packet loss rate of data is stable at less than 0.5%.

Table 1: Collection of information system test results

Test serial number	Amount of data sent	Receiving data volume	Packet loss rate
A	8374	8361	0.19%
B	8736	8722	0.17%
C	8916	8896	0.18%

The computer information collection system proposed in this paper is used to collect information on the current situation of networked teaching of community piano education. Figure 5 shows the learning effect of the networked method of piano education and the traditional teaching method. The number of students who have fully mastered the networked method and the traditional teaching method are 13 and 10 respectively. Only one person has mastered a small number of online teaching methods.



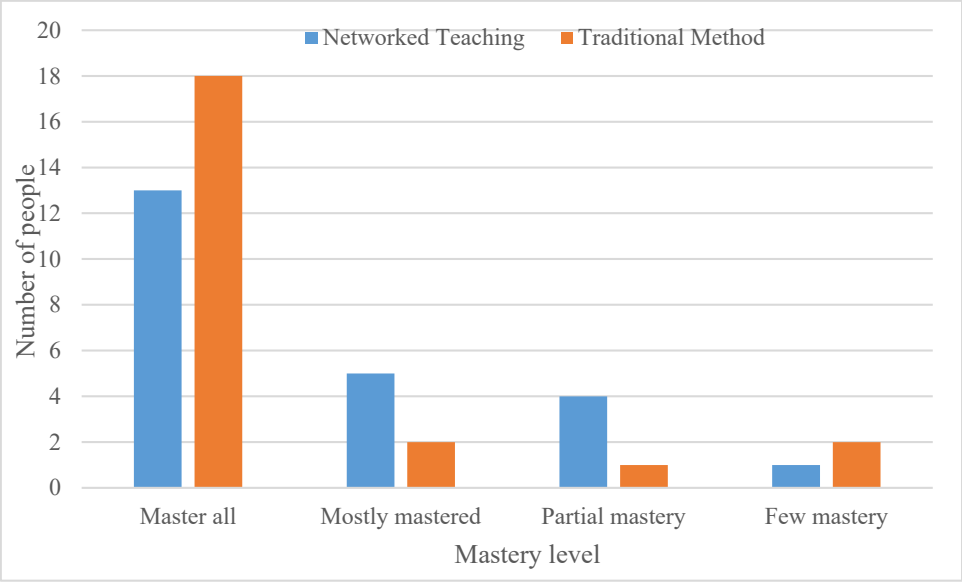


Figure 5: The learning effect of piano education networking and traditional teaching methods

Information was collected on the attitudes of students under 6 years old and over 6 years old in a community participating in online piano learning and traditional teaching methods. Figure 6 shows the information and collection results. Students under the age of 6 or over 6 are more inclined to network piano learning.

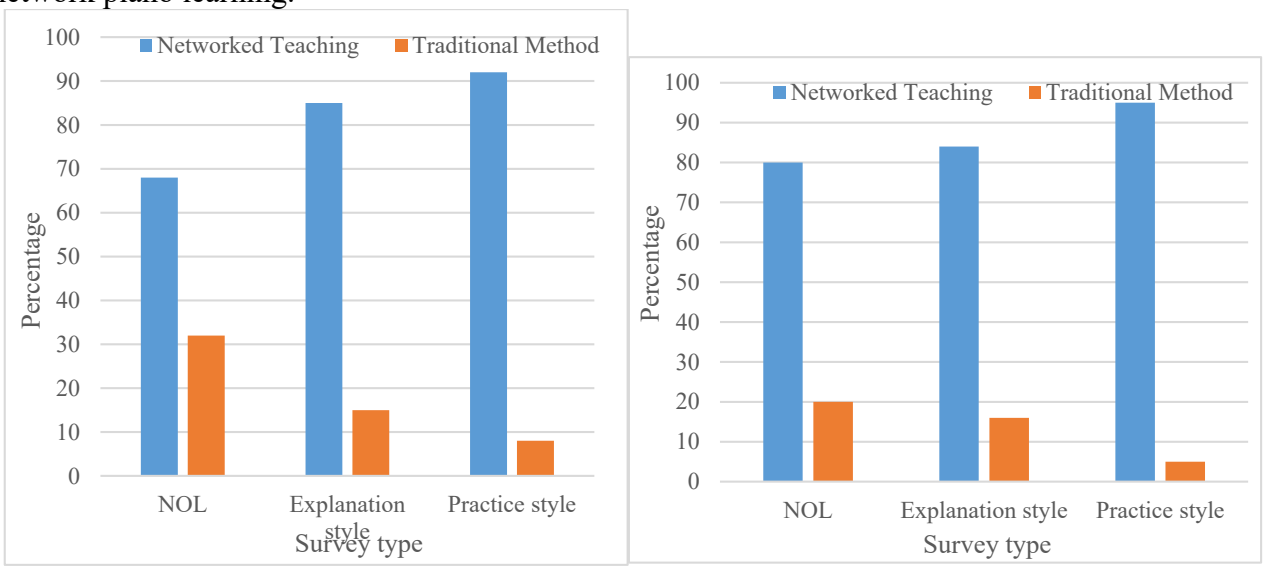


Figure 6: Attitudinal performance of participation in networked piano learning

Through the collection of information on the parents of students in a community networked piano teaching, it is known that the parents think that their children have room for improvement in some aspects after learning the smart piano. The attitudes of parents towards children's learning are obtained, and the results are shown in Figure 7.

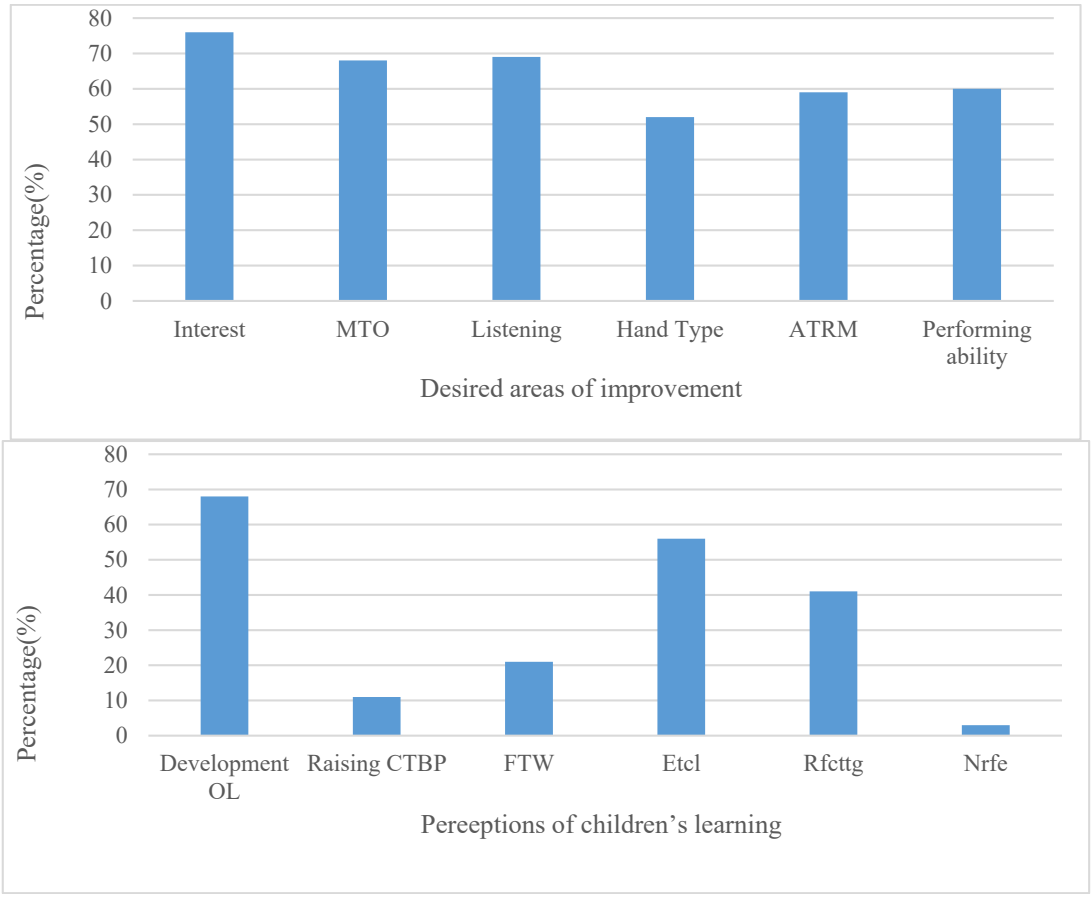


Figure 7: Parents' attitude towards children's learning

The method in this paper is compared with the traditional method, as shown in Figure 8 for the comparison results. The shortest time required by the method in this paper is 4.26 min and the highest is 5.6 min, which greatly improves the efficiency of the existing method.

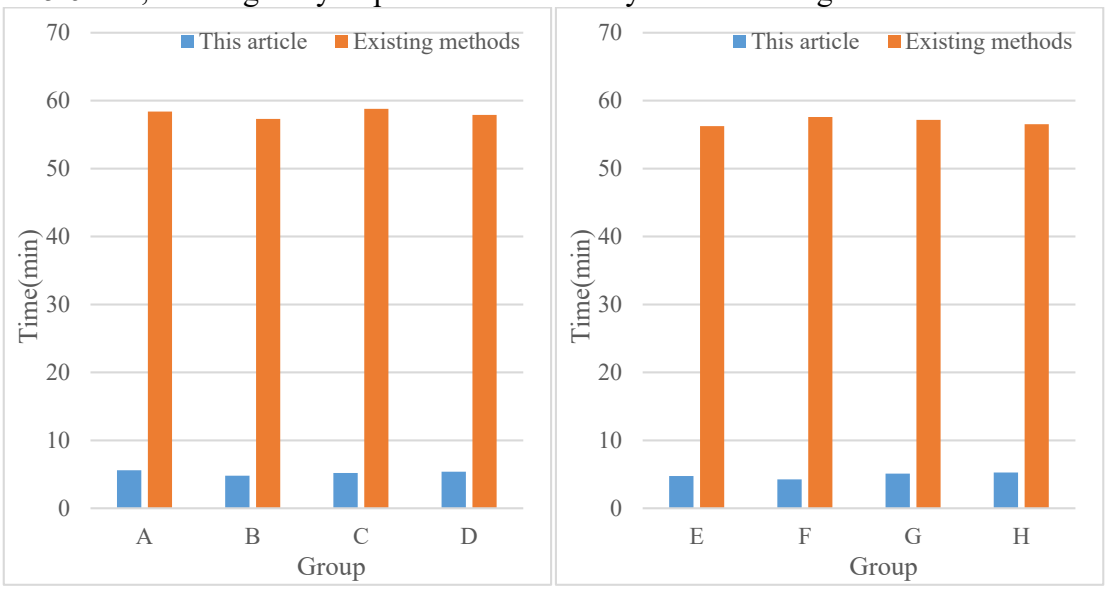


Figure 8: Comparing this method with traditional methods

There are many participants in the network, and any link may pose a security threat to the network for human reasons. The "backdoor" added by the programmer in the program to facilitate

maintenance may also be exposed to attackers; Due to the lack of security knowledge or negligence, the insecure configuration of network administrators in network devices, servers, network services and other locations will give attackers an opportunity to take advantage of; Due to weak security awareness, some system and application passwords set by network users are usually relatively simple, while other network users are vulnerable to the deception and inducement of attackers to enter phishing websites or download malicious programs.

Today, with the rapid development of the network, the Internet has become very simple. However, college network users are limited by their professional interests, and there are many people who know nothing about security concepts and technologies, which poses a hidden danger to college network security. In addition, the world outlook, values and lifestyle of college students in online colleges and universities have had a profound impact. The spread of some harmful information reduces college students' sense of responsibility and moral level, thus making college students further become the source of harming network security. All these need colleges and universities to strengthen network security related education. At present, network security administrators and managed persons in colleges and universities do not pay enough attention to and deepen network security related education, and most colleges and universities lack professional network security knowledge and the latest network security laws and regulations.

4. Conclusion

Faced with the popularization and application of mobile communication technology, and the current situation of "5G+cutting-edge technology" changing the trend of traditional teaching media, what are the internal development laws of various teaching media used in the field of education and teaching in the 5G education application scenario, and what strategies should be followed for the use of teaching media in the 5G/6G education application scenario, etc, All these should be the focus of educational researchers. Online education continues to heat up, and market demand is constantly being tapped. Continuous integration of the Internet and piano education has produced a series of new piano education products centered on Internet technology and Internet platforms, which have brought a new atmosphere to the traditional piano education field. In this context, online piano teaching came into being. A data acquisition system is designed to realize the acquisition of parameters and data. Modules of the system are introduced, and the successful simulation algorithm is implemented, which effectively improves the analysis efficiency of the networked teaching situation of piano education. In theory, we have not fully grasped this theory. The online teaching of piano education is also in rapid iteration, and the problems that can be solved or the problems that will be exposed in the future will change over time.

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