



Optimization of Early Childhood Education Information System Based on Computer Aided Methods

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Abstract. The healthy growth of children is one of the most concerned problems in today's society. Children's growth cannot be separated from family and kindergarten. In order to cultivate the early childhood education, the current society has used the information method for the early childhood assisted management, but there is a lack of an effective way and means, children's information display is not complete, humanized design is not ideal. Application of kindergarten management based on computer aided system for parents to provide a public platform for sharing and record the children grow up, let parents deep into the early childhood education, attention to the child at any time, at the same time, teachers access to information channel, chartered reduce between teachers and parents due to the problems caused by information feedback in time, for the parents and the kindergarten provides a convenient information environment. The main work of this paper is to design and implement the system, according to the early investigation to determine the problem to be solved, and then determine the business process of the system and the needs of users, and finally achieve this system. Study the development of domestic and foreign infant management system in mobile application, through the actual research to determine the necessity of the system development. Summarize the management mode of domestic and foreign kindergarten management system, according to the current kindergarten management process and user needs to clarify the system demand analysis. Based on the demand analysis of the system, the mature technology and

framework structure in the current development are integrated to design the architecture, functions and database of the system.

Keywords: Computer aided; early childhood education; information system; healthy growth; optimize

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1 INTRODUCTION

The continuous improvement of productivity level, human society has gradually entered the information society. The continuous development of enterprise informatization level drives all walks of life to enter the informatization stage, among which the development of education informatization level is particularly rapid. In addition to universities, primary and secondary schools have realized educational informatization, early childhood education has also gradually realized educational informatization. The biggest difference between the life of children in the 21st century and the life of children in the last century is that with the addition of computers and information technology, many daily objects and activities in contemporary children's life will be based on computers, and the influence of computers and information technology can be seen in every corner of children's life. Computer and information technology is the most significant feature of this era, no matter whether adults let children to access this information, they will unknowingly go to "touch" this knowledge and be greatly affected by this aspect, software is the "brain" of the computer, is the computer in the use of wisdom. For children's computer activities, the nature of software will affect children's learning and development in a certain sense. However, the majority of teachers and students in Our country are not satisfied with the quality of computer assistance, and early childhood education cannot escape this fate. With the development of information technology, early childhood education is increasingly demanding computer assistance. However, the current early childhood education computer aided good and bad are mixed, the market situation is not optimistic [1].

Use of computer-aided preschool education information system is the basis of early childhood education informatization implementation, it not only can help managers to realize office automation, realize information sharing, enhance the capacity of decision analysis, can also improve their management level, the teaching quality and the quality of service for parents in general can improve the image of the public kindergarten. The management information system with complete functions, low price, simple maintenance and strong scalability is the premise for the majority of kindergartens to buy [2]. In addition, in order to strengthen the publicity of kindergartens, improve the public image and attract more users, the mode of management information system has become another important factor for buyers to consider. With the computer hardware price and communication price of continuous rationalization, broadband has entered thousands of households, the use of the Internet has become an important part of people's life, relying on the Internet B/S structure of information management system has become the current main mode, because it only needs to be installed on the server, For the majority of users of the computer as long as the Internet through the browser can be used, greatly reduced the use of complexity.

Through the reference of foreign early childhood education informatization, as well as the research of many domestic kindergarten management systems, it is found that there are still some deficiencies in the management information system of domestic kindergarten. The function of the system is not perfect. It only provides the collection function of basic information and simply realizes the query and statistics of data. It lacks the progressive mining of data and provides the decision-making analysis function for managers. The code of the system development has high coupling degree and poor reuse, and references the API of the bottom of the operating system, which has poor scalability and portability. The system has low security performance and is often attacked by hackers, so the security needs to be further strengthened.

2 RELATED STUDIES

Bong and Dong [3] explore the computer-aided implementation of children's story making system to improve children's creativity. The existing computer-aided early childhood education products are limited to the provision of fixed 2D image features. By taking a 3D moving image of a character type as an object and using a 3D simulation that can be easily placed on the screen, children's direct participation can be derived. Tareq [4] was adopted a quasi-experimental design, including pre-test and post-test. The experimental group and control group went through three stages. The first stage was the pre-assessment of learners' skills. The second stage is the development of the use of computer aided technology; During the evaluation phase, working memory was measured using the Corsi task and basic mathematical skills were measured using the TEDI-MATH Test for Diagnosis of Basic Mathematical Abilities. Yaser and Ismail [5] proposed an interactive learning approach is that allows learners to interact with their learning content in a real world environment. Learning environments and tasks are matched with learning content and outcomes, and a computer-assisted mobile application is developed to allow preschoolers to experience their own learning environment, using interactive learning methods and mobile technology to quickly respond to codes to learn counting and quantifying skills. Philip and Vien-Thong [6] analysis reveals three schools of thought that constitute the knowledge structure of the knowledge base: sustainable development education, sustainable development thinking, sustainable development teaching and learning. The conclusion from the literature analysis is that the current knowledge base of computer-assisted infant information system is biased towards critical, descriptive and normative papers, and lacks the subject of analytical empirical research. Some suggestions on computer aided infant information system are put forward to strengthen the literature in this field. Estefanía and David [7] significant gaps in knowledge about the use of this technology in early childhood education. Most researchers have focused on the pedagogical theories behind the use of touch-screen devices, but there is not much empirical research on how these technologies affect students' learning processes.

Computer aided has the following characteristics, early childhood education is a education attribute, namely, early childhood education computer aided classification due to the different classification standards, there is no unified standard of classification, there is also a cross between them, according to different medium, the preschool education computer aided can be divided into stand-alone preschool education software, online in early childhood education software. According to the dimension of entertainment-education, early childhood education computer assistance can be divided into entertainment early childhood education software, entertainment-education early childhood education computer assistance and educational early childhood education computer assistance. According to the different guiding ideology in the design of computer assistance, the early childhood education computer assistance can be divided into: one is training guided by behaviorism learning theory; the other is development suitability computer assistance based on constructivism learning theory. The role is to better teach children or let children learn, is an intelligent tool. One is software properties, that is, the characteristics of general software, technical characteristics and structural characteristics. Another educational content carrier, the biggest difference with general computer assistance is that the early childhood education software is suitable for children to learn the educational content, reflects a certain educational theory.

The evaluation subjects are mainly professionals and software producers, while there is almost no evaluation from teachers and parents, which will affect the publicity of software. If a software is evaluated by front-line teachers and parents, because it is directly in contact with children, the credibility of software evaluation will be increased. Professional evaluation is necessary, a professional software evaluation of early childhood education organization, an authoritative award evaluation personnel will improve the quality of evaluation, which is lacked in our country, so far our country has not yet been a software evaluation organizations and professional early childhood education awards, this is also should strengthen the aspects. The main body of multiple evaluation is the development direction of the evaluation of early childhood education software in China.

3 DESIGN OF COMPUTER AIDED EARLY CHILDHOOD EDUCATION SYSTEM

3.1 Computer-Aided System Design

CAI has different guiding theories and courseware design principles in different stages. The application of computer in the practice of early childhood education needs to locate the courseware in cultivating children's comprehensive quality and ability according to the guiding principles of theory, and focus on enlightening children's happy life and happy learning. Through the analysis of teaching objectives, according to the essential needs of children's teaching activities, teachers face different teaching objects to determine the theme content of each specific teaching activity, and must use computers to create cultural situations related to the theme. Effective information resources collection and high-quality courseware design shall be carried out according to the teaching needs, the information resources required for this teaching activity shall be optimized and integrated, and the computer information resources shall play a positive role in the process of this activity. Teachers should clarify and find ways to break through the key points and difficulties, and give full play to children's innovative spirit and exploration interest as much as possible, Make their knowledge accumulation more interesting. In the case of children's autonomous learning and implementation of "human-computer" interaction, group discussion and consultation should be carried out to further improve and deepen. With the emergence of multimedia computers and the development of a large number of multimedia teaching, children's language acquisition environment has been studied, designed and developed to varying degrees, and the effect of children's language learning has been continuously enhanced and improved. There are some multimedia computer-aided education systems suitable for children's learning. Multimedia computer provides children with pictures, texts, sounds and music. Multimedia computer-aided education system directly simulates the content of life, so that children can further experience real life and cultivate practical ability. It has strong interaction and self-evaluation functions. However, due to the computer itself for young children, its operating ability, time and health, the learning environment created by these high technologies is difficult to become the main way of children's language acquisition [8]. Therefore, in kindergarten language teaching activities, it is urgent for teachers to deeply study how to create a multimedia learning environment by using computers according to the law of children's physical and mental development.

JSP full name is Java Server Page, is led by Sun Company, a number of companies involved in the research and development, based on the development of Servlet technology, inherited many advantages of Servlet, in addition to the HTML code can be directly embedded in Java code, Built-in request, response, session, application context and output flow of 9 common Web objects, support EL expression and JSTL tag library, making dynamic Web pages in the development of more simple, more convenient. With the continuous development of technology, JSP is only used as a presentation layer technology, all business logic functions are completely separated out, for the dynamic function of data display can be realized through the label. When a JSP page is first accessed, the JSP engine translates it into a Servlet source program and then compiles it into a Servlet class file. The Web container then manages the instance generated by translating JSP pages into Servlet programs to respond to the browser in the same way as a normal Servlet program is invoked, as shown in Figure 1.

There are many conditions to carry out creative teaching in early childhood education and teaching, one of which is to prompt cognitive objects and train thinking from multiple angles, directions, levels, ways, sequences and ways. CAI can just provide this condition. In the process of early childhood education and teaching, give full play to the advantages of computer and give full play to children's creative thinking and subject consciousness. It has the advantage of multiple transformations. It can not only expand the cognitive field and prompt the internal logical relationship of teaching materials, but also teachers can explain, ask questions and set questions in multiple transformations, inspire children to think hard, expand children's thinking space, and cultivate children's innovative spirit and creative potential [9,10].

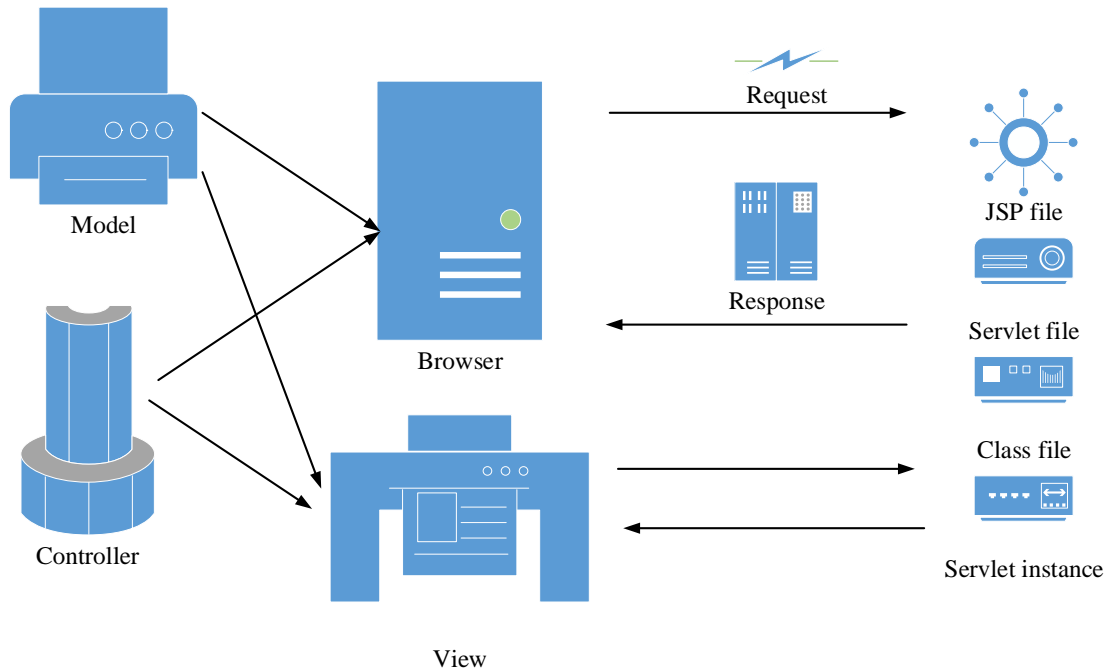


Figure 1: Implementation process.

Cultivating innovative consciousness in early childhood education and teaching activities is a scientific, systematic, long-term, continuous and arduous educational task. Innovative consciousness can be divided into its origin, severity and priority. In the process of early childhood education, summary and reflection should be regarded as the starting point of cultivating innovative consciousness, which is an important teaching content to improve children's comprehensive quality. Only by deeply analyzing the comprehensive factors of current early childhood education, doing a targeted job in every link of innovative education and teaching practice, seriously doing a good job in investigation and research, clarifying the root causes of the problems, and formulating practical plans can we truly ensure the innovation ability and quality of participating in practice in the future. Secondly, in early childhood teaching, we should enable children to develop good thinking habits and learn scientific thinking methods.

3.2 Computer-Aided System Optimization Analysis

According to Figure 2, morning exercises accounted for 89.6% of the activities related to children's gymnastics courses and ranked first, followed by extra-curricular training, followed by classroom teaching, accounting for 46.2%. Optional sports ranked fourth, while competition accounted for the lowest proportion.

Using computer network, multimedia and other related technologies, children's interaction and cooperation can be realized for the same learning content, so as to achieve a deep understanding and mastery of the teaching content. In this process, multiple children complete a learning task together, let them give play to their cognitive characteristics, argue with each other, help each other, prompt each other, or divide work and cooperate, which can achieve the educational purpose of getting twice the result with half the effort.

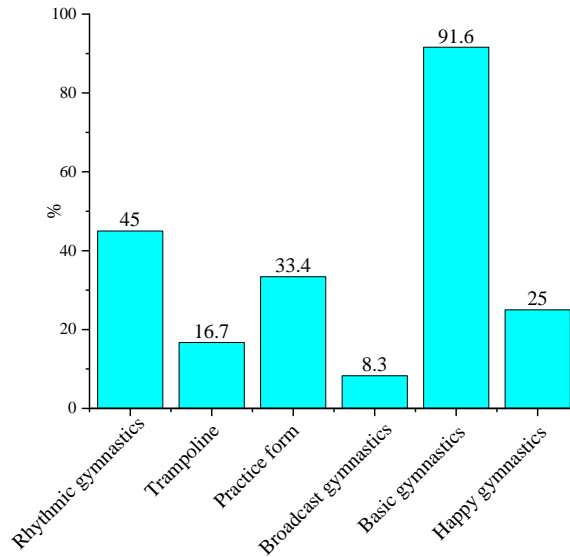


Figure 2: Forms of curricular activities in kindergartens.

For example, when learning the knowledge of silkworm baby that children are very interested in, teachers can provide several relevant web pages for children to collect pictures and materials, discuss and summarize together, so as to obtain a wider range of knowledge and experience. This web-based collaborative learning system allows multiple learners to solve the same problem through the network. Each learner must discuss with other learners, exchange their views and share collective wisdom.

Many common sense and scientific phenomena in kindergarten science education activities are difficult for children to understand with the demonstration of traditional teaching aids, but with the simulation function of computer, many abstract and incomprehensible contents can become vivid and interesting, simplify complex things, shorten the process of time, shorten the distance of space and enlarge microscopic things, Reduce the macro. The teaching process can not only give conclusions, but also demonstrate the process of change, so that the knowledge that teachers have to spend a lot of time and still can't speak clearly becomes clear at a glance. For example, in the process of learning the growth of plants, it is difficult for teachers to speak, and children sound very laborious. By using multimedia teaching software, the computer can simulate the morphology of plants in different periods from germination to withering, which makes difficult problems easier, and children can easily understand the life of plants. In addition, the use of computers can also simulate many macro or micro structures and change processes that cannot be directly seen by the naked eye. Children have high interest in learning and good results.

According to the characteristics of children's psychology and age in Figure 3, the traditional teaching mode which only relies on teacher's explanation, body movements and simple teaching AIDS in children's teaching has been unable to achieve the effect and achieve the goal of teaching. Computer aided instruction has become an indispensable teaching method in education and teaching. It is widely used in modern education with the advantages of picture, text, sound and video, which can solve the intuitive demonstration effect that traditional teaching cannot achieve. Kindergartens also generally changed the traditional teaching methods, a large number of multimedia equipment to implement computer aided teaching.

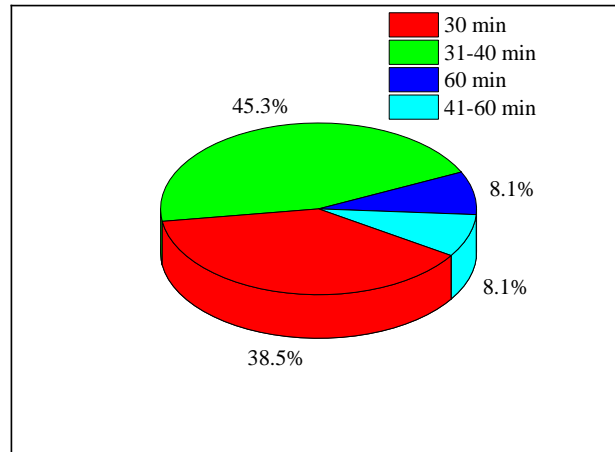


Figure 3: Activity time.

Stimulate children's interest in learning, so that children learn vividly, remember firmly. So as to better break through the key points and difficulties in teaching and improve teaching efficiency. Different kindergartens have different educational philosophies and characteristics, leading to different courses and no unified teaching materials.

3.3 Influence of Computer-Aided Education on Early Childhood Education

The emergence of the computer aided education and rapid development, and constantly changing the school education purpose, content, forms and means, such as computer aided education affect y infant school education is not static, but with the continuous development of computer aided education technology itself and the continuous improvement of understanding people and gradually in-depth. Especially computer aided education will play a more and more important role in preschool school education. As a learning tool, computer makes learning more active and personalized, enhances learning interest and improves learning ability. As a tool, computer is the most complete tool that human beings have so far, such as word processing, spreadsheets, data management, information query, picture processing, communication means.

Computer-assisted instruction (CAI) is a modern teaching method in which teachers use computers as teaching media to carry out teaching activities, assist teachers to complete the teaching process, and teach students knowledge and training skills, so as to promote students to achieve effective learning in Figure 4. Computer-aided instruction will make it possible for students to learn independently. Individualized teaching will be universally realized. The role of teachers will change significantly. The implementation strategy should be determined according to the requirements of the teaching content. According to the actual needs of teaching management and auxiliary teaching, the auxiliary teaching system can be divided into the following functional modules according to the functional structure: course learning module, homework management module, assessment and evaluation module, online questioning and answering module, system management, forum exchange module, etc. Among them, system management includes system user management, basic information maintenance two subsystems. The basic information maintenance includes announcement information management, question bank management, student information management and so on.

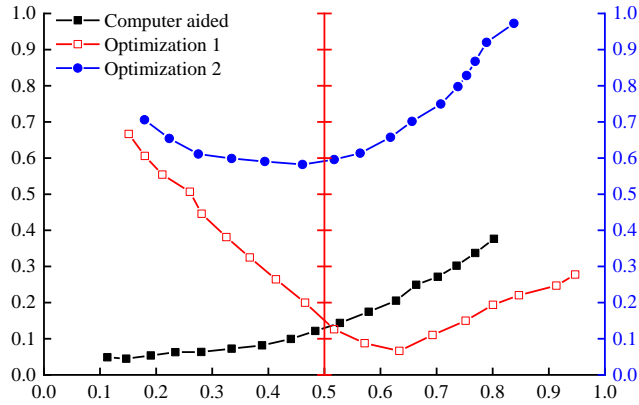


Figure 4: Contrast figure.

In the development of an information system, a problem throughout the whole development process is data and processing of data. Data is usually stored in database, so database design is the main work of information system design. Database is like the "foundation" of the system, and the quality of the "foundation" directly determines the performance of the system. A good database design can not only improve the development efficiency, but also leave room for the expansion of system functions. Computer assistance should have data acquisition, data input and editing, data management and query, printing and other basic functions to consider the object used by the system - teachers and students. From the macroscopic point of view gives the overall function design, and designs the system overall function module diagram. Then, according to the overall functional module diagram, detailed introduction of the system each module function. On the basis of the module, the sub-module and corresponding functions of each module are introduced in detail.

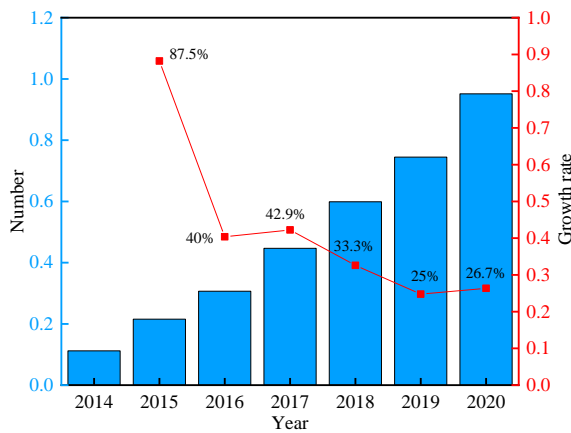


Figure 5: Computer-aided numbers and growth rates.

Students are the main body of teaching, so the teaching curriculum should be set and optimized closely around the actual needs of early childhood education. The setting and optimization of teaching content is to let students achieve teaching objectives faster and better, so the teaching content and teaching objectives should also maintain a high degree of unity. Preschool curriculum should aim at cultivating professional talents with comprehensive abilities. The curriculum of preschool education should give priority to cultivating high-quality talents with comprehensive

knowledge structure and strong practical teaching and guiding ability. Computer aided information system optimization analysis in Figure 5.

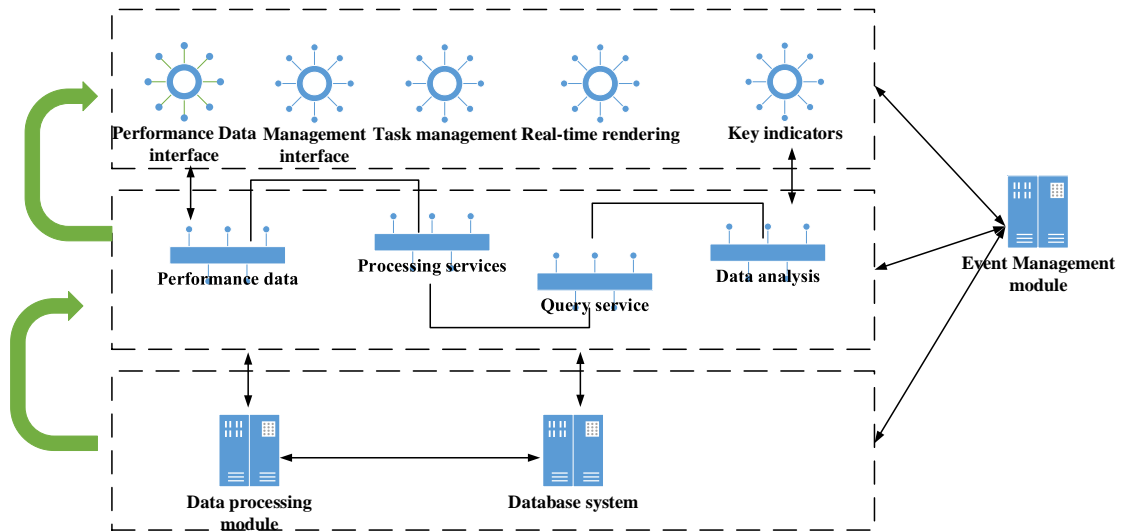


Figure 6: Wireframe diagram.

As shown in Figure 6 was wireframe diagram. We communicated with experts through interviews. After sorting out and summarizing the interview results, we summarized the opinions of experts. The optimization of preschool curriculum for preschool education specialty needs to meet the needs of students' personal development and society's demand for preschool teaching talents by improving the curriculum system according to the training goal of cultivating preschool sports talents. Therefore, optimization of preschool education specialized baby gym course should follow the principles: according to the current kindergarten proposed social need of preschool teachers' high standards and comprehensive ability, this requirement to include in preschool curriculum system has a comprehensive knowledge of early childhood education, ethics and moral education, shall also have perfect teaching skill and strong ability of teaching organization and protection. Preschool pre-school education is a professional field, mainly reflected in preschool education and preschool teachers have professional particularity, early childhood teaching for young children not only teach knowledge and gymnastics skills, but also from the law of children's physical and mental development, education and training is growing children, Therefore, the optimization of preschool curriculum should pay attention to the vocational particularity and professionalism of preschool education in Figure 7.

Preschool education resources platform storage resources very much, these resources are often chaotic, messy, although meet certain organizational principle, but people use data is very complicated, therefore, the introduction of early childhood education resources platform in the design of deep learning, first of all need for platform information preprocessing, pretreatment can be in the process of building model, Video data, images, data, text and audio data classification, at the same time can also be in accordance with the principle of structural organization, the data is divided into relational data, object data, the data resources integration in together, can also according to the needs of users at the same time, the temporary add some filtering measures, these measures can filter some noise data, Improve data consistency and reliability.

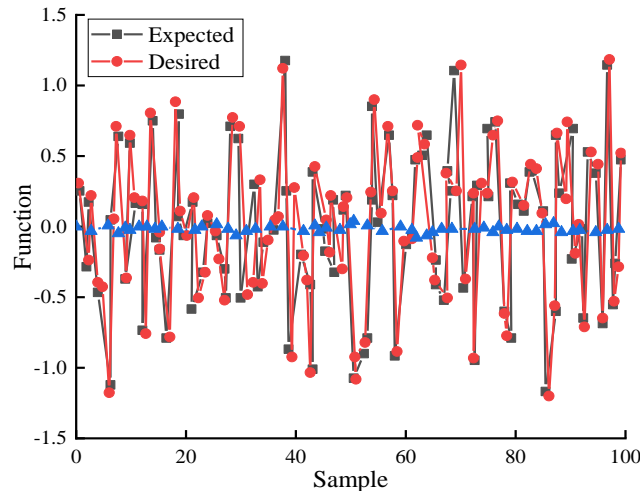


Figure 7: Expected and actual predicted results.

Secondly, the platform can also integrate the data, which can be input into the computer aided system after integration, which can improve the timeliness of data utilization and shorten the time of data processing.

4 CONCLUSION

Computer-aided form has a great influence on the development of children's interest in learning and attention. Children learn actively, think actively and pay attention to stability in such a situation, which is of great help to their good psychological process and personality development. Multimedia teaching adopts the integration of sound and image. Can give full play to the activities of the children's senses, at the same time encourage children to take an active part in human-computer interaction friendly interface, and access to the information can be said to be the form of a 3d rendering, compared to traditional teaching to present information is flat, sequentially approach has the advantage of larger, in children with specific image as the main characteristics of the form of thinking, easily accepted by children. Therefore, children are more active, active, serious and focused in this form of teaching.

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