Development of Interactive Teaching System for Preschool Education Classroom

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Abstract:
With the advent of the Internet era, the rapid development of smart phones, ipads and other mobile handheld devices provides a suitable development platform for education. In the field of education, interactive teaching can enrich the teaching scene and enhance students' understanding of knowledge. Along with the progress of the society and the development of science and technology, human society has gradually entered the information era, with the computer as the core of multimedia technology is growing education a wave, gradually tends to digital, network and individualized teaching mode, preschool education way is also to the becoming an information based society to go forward, advanced education media and education mode for pre-school education brings new opportunity. This paper mainly aims at the current situation of interactive teaching system development in preschool education classroom, and makes its own opinions according to the current situation, the purpose is to speed up the open process of interactive teaching in preschool education classroom, so as to effectively promote the development of interactive learning system in preschool education classroom.

Keywords: *Preschool education, interactive teaching*

1 INTRODUCTION

China's preschool education informatization started late, and the overall level of development is also low. In the development stage [1], advanced information technology and high technology are needed to assist in teaching reform, among which multimedia whiteboard and flat screen TV can effectively help students to learn preschool education, but the real effect is limited. Based on information technology and other high-tech research and development of children are learning tools in the initial stage, the child can be independent operation of the equipment is less, although education subject interactive technology platform has already started, but the real new digital learning environment and virtual learning environment is still in the initial construction of China's preschool education present situation is also in the initial development stage [2], The difficulties and obstacles lie not only in the technology itself, but also in the serious divergence from the situation of professionals, professional content and professional products [3]. Therefore, the development of interactive teaching system in preschool education classroom is urgent.

2 FRAMEWORK ANALYSIS OF PRESCHOOL INTERACTION SYSTEM

2.1 Requirement Analysis

In the multimedia environment, interactive functions can communicate among teachers, students and teaching software, and adjust the three through information exchange, so as to create the best teaching environment and maximize students' efficiency as much as possible. Therefore, the interactive learning system needs to meet the following requirements:

The first is the bidirectional nature of the interaction. In the operation of the teaching system, it is necessary to do a good job in real-time interaction, teaching media should reflect the information provided by students in time, and teachers should transmit useful information to students in time, which is the key to measure the merits of interaction [4]. The second is the real-time nature of the interaction. The real-time interaction requires that the system should interact in real time, and the teaching media should feedback the information provided by the students in time and deliver the message to the students in time, which is the key to the advantages and

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disadvantages of the teaching system. Finally, the flexibility of interaction. Teachers and students can have more flexible communication, so that the interaction in a natural way, thus creating a good learning environment, to improve students' learning efficiency.

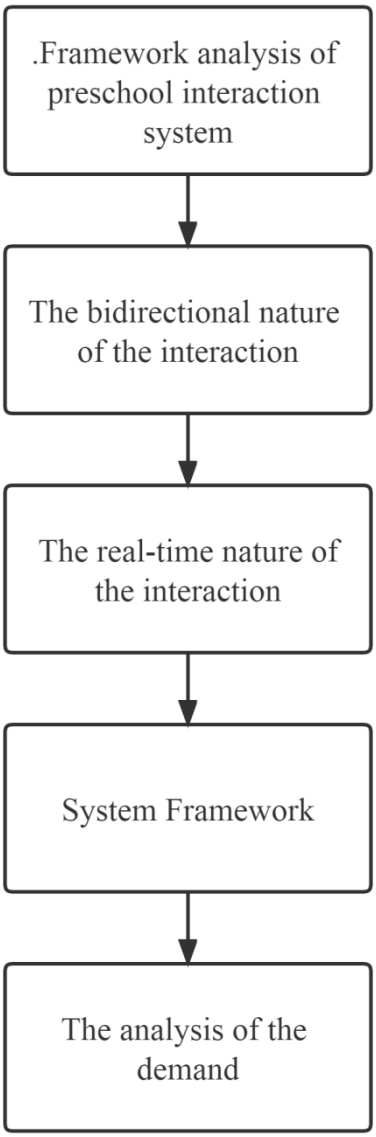

Figure 1: Framework analysis of preschool interaction system

2.2 System Framework

Based on the system for the analysis of the demand, this paper constructed the system can use the interactive electronic whiteboard, or touch screen control the whole process of teaching, teaching by playing children, in view of the video content on children's performance in the classroom to heuristic interactive learning, to evaluate the effect of learning by the reaction of children [5]. Through Kinect real-time dynamic capture technology for real-time identification of children's classroom performance, the children's classroom performance data recorded and stored in the background database: the computer will make feedback in time according to the children's performance data, in order to achieve interactive preschool education classroom teaching.

```
var
audio_data:aray[1..8192]ofchr; i:integer: begin
for:=Otosizedo
Audio datali:=pchar(dword(data)+i-1)
audio  client.SendBuffer(audio data size);
end;
```

System USES the current popular three layer architecture design mode, from the presentation layer (UI), business logic layer (BLL) and data access layer (DAL) of three hierarchies, among them, the business logic layer contains the business rules, data access, the check of legitimacy, the client and the database by using COM/DCOM communication connection with the business logic layer, Interact with the database through the business logic layer [6]. The user passes the request to the business logic layer through the operation presentation layer, and the business logic layer completes the relevant business rules and logic, and accesses the database through the data access layer to obtain data, and finally returns the result to the presentation layer, which is more conducive to standardization and reuse of logic of each layer, making the system structure more clear.

Table 1. Framework analysis of preschool interaction system

Framework analysis of preschool interaction system	
Requirement Analysis	System Framework
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	effect of learning by the reaction of children.
The second is the real-time nature of the interaction.	the computer will make feedback in time according to the children's performance data, in order to achieve interactive preschool education classroom teaching.
Finally, the flexibility of interaction. Teachers and students can have more flexible communication, so that the interaction in a natural way, thus creating a good learning environment, to improve students' learning efficiency.	System USES the current popular three layer architecture design mode, from the presentation layer (UI), business logic layer (BLL) and data access layer (DAL) of three hierarchies, among them, the business logic layer contains the business rules, data access, the check of legitimacy, the client and the database by using COM/DCOM communication connection with the business logic layer, Interact with the database through the business logic layer.

3 REALIZATION OF PRE-SCHOOL EDUCATION MANAGEMENT SYSTEM

In the construction of system functional modules, seven functional modules need to be established, and their specific structural modes are shown in the figure below:

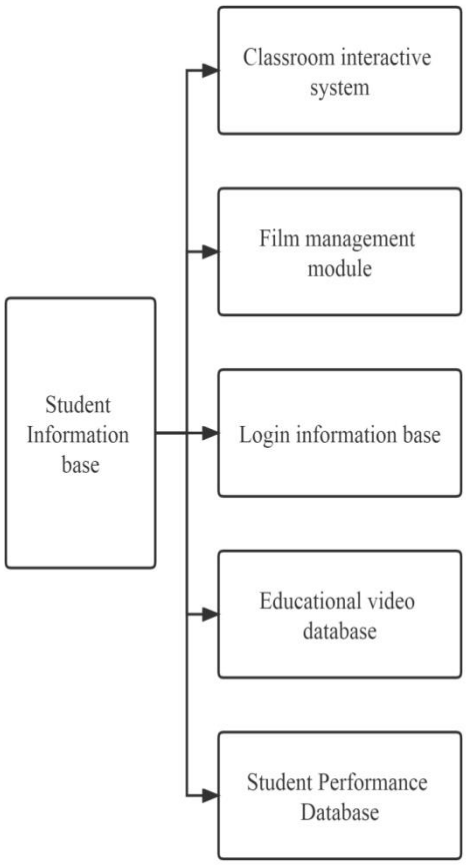

Figure 2: System functional structure

The first is the login module. You need to determine the permission of the teacher based on the user name and password to enter the interface for the teacher to manage the class [7]. In order to prevent illegal users from logging in, a system registry was established for teachers. On this page, teachers enter their user name and password in the TextBox, The system uses the SOL query statement select count (1) from dbo. users where username=@username to check whether the username exists. Run the select password from dbo. users command Where username=@username statement to determine whether the password is correct, after the input is complete, click the login button, if the input is wrong, MessageBox control Show (" username and password do not match "); Otherwise, enter the teaching interface.

$$\mathrm{std}(X) = \left(\frac{1}{n-1}\sum_{i=1}^{n} X_i^{\,2}\right) \quad (1)$$

$$\mathrm{Mag}(n) = \frac{1}{M}\sum_{M=0}^{M-1}(x_i^{\,2}\text{-}1)|S_n(m)| \quad n = 0,1,\cdots\cdots,N\text{-}1 \quad (2)$$

The second is the video teaching module. It is used to play teaching movies for children [8]. Teachers choose different movies to teach by video through the classified list of movies, and conduct interesting questions and answers for children according to the questions popped up in the movies. In VS2010 programming environment, right-click "Toolbox", click "Select Items" to open

"Select Toolbox items", click "COM Components", check the list of "Windows Media Player" and ok, add it to the corresponding toolbox TAB, Find the WindowsMedia Plaver control and drag it to from to add WindowsMedia Player [9]. The catalog list of instructional movies displays the data in the movie data table through the DataGridView control. Double-click the playlist on the right, the system obtains the movie storage path sourceURL, and plays the movie by calling the cTLControls.play () method of AxWindowsMediaPlayer. When the movie plays to the time point of setting the problem, the movie automatically pauses, and the problem dialog box pops up.

Table2. Realization of pre-school education management system

Realization of pre-school education management system	
The first is the login module	You need to determine the permission of the teacher based on the user name and password to enter the interface for the teacher to manage the class. In order to prevent illegal users from logging in, a system registry was established for teachers.
The second is the video teaching module.	. It is used to play teaching movies for children. Teachers choose different movies to teach by video through the classified list of movies, and conduct interesting questions and answers for children according to the questions popped up in the movies.
The third is the real-time capture module.	Kinect action recognition technology can automatically capture the number of children raising their hands and answering questions in class, as well as the correct rate of answering questions.
The fourth is the performance query module.	Used to query the performance data of children in class. When teachers input the time period they want to query, they can view the performance rankings of children in this time period, and generate the performance curve table of each child, which is convenient for teachers and parents to analyze the growth process of children in detail.
The fifth is the information management module.	It is used for the management of children's basic information. The main functions include uploading children's profile pictures, editing, adding and deleting children's basic information. This module is mainly used for basic storage of children's information.
The sixth is the film management module.	For the management of teaching films, the main functions include adding and deleting teaching films, and extracting pre-set teaching questions according to teaching films.

The third is the real-time capture module. Kinect action recognition technology can automatically capture the number of children raising their hands and answering questions in class, as well as the correct rate of answering questions. Teachers input real-time data into the database through this module. This module uses Kinect action recognition function to identify children's classroom performance, mainly identifying children's actions of raising their hands and standing up to answer. Kinect is

connected to a computer, and Kinect is downloaded and installed for Windows V15. Finally, the Developer Toolkit is installed, and the high-level natural user interface (NUI) and application programming interface (API) of KinectSDK package, such as bone tracking, are used to provide program calls.Because Kinect can only be followed by two people at most, this system will identify two children as an example. Add code to the reference section of the Main window.xaml.cs namespace: Using MicrosoftKinec, in the event of an WindowLoaded add KinectSensor. KinectSensor. FristOrDefault9 (), select the first sensor has access to access equipment. And then define the interval where the coordinates of the bone point change, Kinect: bool isRightHandRaised=(rightHandY-) Kinect: bool isRightHandRaised=(rightHandY- rightElbow.Y)> When righthandRaised determines the change of the coordinate of the righthand bone, the head of the child with his/her hand raised will automatically switch to the head of the child with his/her hand raised. Then click the raise button. System through SQL insert statement inserts data intodbo. Answerquestion, raisehanduseridsansweruserids. Answers. Answertime) values (@ questionid, @raisehanduserids@answeruserids @answers @answertime)' Input one hand data.

The fourth is the performance query module. Used to query the performance data of children in class. When teachers input the time period they want to query, they can view the performance rankings of children in this time period, and generate the performance curve table of each child, which is convenient for teachers and parents to analyze the growth process of children in detail [10].

The fifth is the information management module. It is used for the management of children's basic information. The main functions include uploading children's profile pictures, editing, adding and deleting children's basic information [11]. This module is mainly used for basic storage of children's information. Teachers can edit, add or delete children's basic information through this module, select the film to be edited, and then add the import button to obtain the thumbnail location of his storage through the film and watch it.

The sixth is the film management module. For the management of teaching films, the main functions include adding and deleting teaching films, and extracting pre-set teaching questions according to teaching films [12].

4 CONCLUSION

Interactive system as a new teaching system, one of its acceptance is still low, inevitably there will be a give away to try new technology and using the phenomenon of toys and original teaching materials, there is no perfect experimental results and diversified teaching products, under the condition of the acceptance of the technology education workers hard to avoid is discounted. Teaching methods, technical characteristics and educational ideas influence each other. Under the guidance of educational ideas, teaching methods constantly put forward new requirements for technical means, so as to constantly promote the development of more excellent technology. Therefore, it is necessary to solve these problems. Preschool education based on interactive learning system should also be paid attention to, so as to accelerate the progress of preschool education.

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