

Application of IOT in Information Teaching of Ethnic Colleges

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Abstract

This paper firstly analyzes the present situation of the teaching of ethnic colleges in China and introduces the basic content of Internet of things. And in view of teaching problems in ethnic colleges, combined with the advantages of the Internet of things, taking Gansu Normal College for Nationalities as an example, a new information teaching model based on the Internet of things of national education is discussed, the model integrates the teaching resources of various ethnic colleges, it provides more efficient, excellent service for the majority of teachers and students, it is useful to improve the teaching effect of ethnic colleges.

Keywords: Internet of things (IOT); Teaching of ethnic colleges; Gansu Normal University for Nationalities; Teaching model

1. Introduction

With the popularization of Internet, in the daily life and study, people need to get a large amount of information. At the same time, along with the improvement of their network information literacy, they put forward higher requirements on the network services. The network deals with massive data every day, how to deal with data quickly and easily, and provide personalized web services for the user, it has become urgent to solve the problem of network development.

In our country, in the process of development of educational informatization, due to the geographical location, network transmission speed, the server data processing ability and other factors in minority area, it results in education information platform can not meet the ethnic college teachers and students' learning needs, it is difficult to share information and resources effectively. These problems have become the bottleneck of the development of the ethnic colleges. Therefore, we need to seek a kind of new technology to solve these problems.

In this background of the demands, it is urgent to need a kind of new teaching mode to replace the existing teaching mode, the combination of Internet of things and teaching is vividly portrayed, the internet of things technology into teaching, it will improve the teaching quality. To realize the strategy of rejuvenating the country through science and education, it makes education feed science, at the same time, achievement of science and technology services education.

2. Domestic research trends

The Internet of things refers to the ubiquitous terminal devices and facilities, through a variety of wireless or short distance communication network to realize interconnection (M2M), it uses grand integration mode, unified management of all things^[1,2].

In China, study on the application of the Internet of things is developing. Jia Kai^[3] and Liu Jiansheng^[4] study on the application of the Internet of things in medicine application in circulation. They analyze the application framework and application process in medicine circulation of the Internet of things. Xie Yong and Wang Hongwei^[5] automatic storage management system based on Internet of things. Through the Internet of things to obtain the detailed information of the products and automatic generation of single storage, it uses the electronic label as product identification means in the product identification and product information, it uses the Internet of things to obtain detailed information storage products.

This paper attempts to put the Internet of things and the teaching of ethnic colleges together, this paper puts forward a new teaching method, the biggest differences of the teaching method and traditional teaching method is: new teaching methods can be more time-saving, labor-saving, high efficiency, it can improve the teaching level.

3. The new teaching method under The Internet of things technology

Based on the existing campus network, using radio frequency identification, sensor, wireless data communication, computers and other technology, construct a more extensive campus Internet of things network than the existing campus network. In this network, the system can be automatic, real-time object recognition, positioning, tracking, monitoring, correspond to the trigger event. It can break through the scope of information application and management mode, the digital, intelligent campus get a more substantial development.

Taking Gansu Normal College for Nationalities as an example, the author thinks: Based on the existing campus

network of Gansu Normal College for Nationalities, it needs the following equipment, function and technical support. In terms of equipment, it needs to have perceived functional lighting equipment, central air conditioning, electronic blackboard and electronic desktop, HD audio recording playback device and a recording device. In view of these equipments, it requires the following functions in conjunction, the classroom lighting with automatic recognition function, in some people into or out of the classroom, the automatic light will automatically turn on or off, and it will automatically adjust lighting to save electricity. Central air conditioning will pass through sensitive thermometer to monitor surrounding environment, automatic opening and regulating temperature. Electronic blackboard, blackboard will use the capacitive touch screen, teachers use electronic pen directly to write on the blackboard, or directly open the various file formats within the mobile hard disk, like a slide show, Mp3 play etc. The application of electronic blackboard will achieve no teachers' classroom. Students can watch the electronic blackboard teaching and talk with teacher through electronic desktop. Students' desks mount capacitive touch screen, and they are connected with the blackboard, unified to control. Students in the classroom pass the class icons on the desktop to raise hands to ask a question or answer questions, and they can freely read teachers played slide or other documents. They can pass through the network to download and upload their own work, or pass through the network to download learning materials. Electronic desks are provided with a safety system, it can effectively prevent the student to use network game behavior in the classroom. The classrooms are installed in the HD voice recording equipment. The devices will automatically open when the teachers begin to record, teachers' excel-

lent record for other students or teachers' to refer. The classrooms are provided with HD video recording equipment. The function and HD voice recording equipment are similar, it has a special function: real-time monitoring the classrooms, to ensure the safety of the classroom facilities and student supervision. These devices and functions will constitute an autonomous control system.

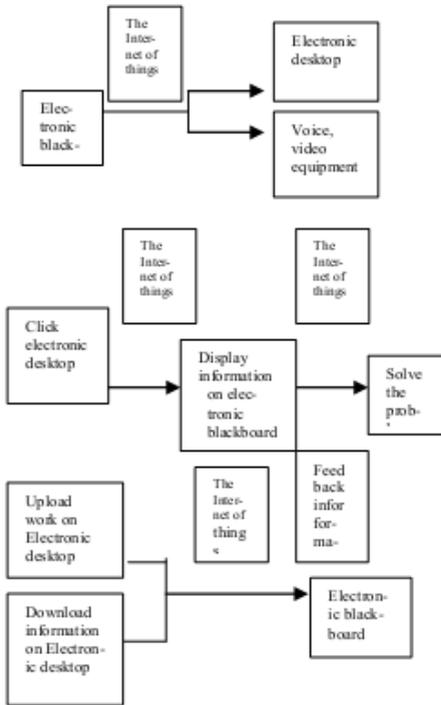


Figure 1 Internet of things control system

The Internet of things technology support are: the electronic blackboard in the classroom, electronic desk, HD voice, video recording device via the Internet or Bluetooth protocol for Internet, to carry out Internet of things of the classroom. When electronic blackboard open, it will transfers to the electronic desk signal and voice and video recording equipment via the Internet or Bluetooth automatically, allowing them to open operation. Students can call voice and video recording device recording of the voice and video

through the desks of the electronic screen. The teachers may pass through the icons on the electronic blackboard to control the student desk, such as the unified operation or data transmission. The students click the hand' icon on the electronic desks, it will show the position information on the blackboard. This design based on Internet of things function of campus control system, it realizes to control the unified equipments and transfer signal among equipments. In the operating system, it uses the embedded operating system Linux. Figure 1 is a networking control system design.

In the Internet of things technology support, which can support the college classroom teaching, but also it can support the student's extracurricular learning.

In the classroom teaching: The first: Teachers pass through the sensors in the hands of students for teaching evaluation real-time, it can improve teaching efficiency, save energy and promote students' transfer of learning. Second: Enrich teaching resources. Teachers can mount various types of sensors on the experimental equipments, it can collect experimental data real-time through remote controlling these experimental equipments, then process and analyses the results, provide to the experimenter through the network. The students can view and analyze data through computers and other equipments. It can ensure that the completeness, authenticity and validity of experimental data, it can also realize the experimental teaching mode and improve the learning interest of the students and solve the traditional classroom teaching resources limited and save all kinds of funds. Third: optimizing the learning environment. The school teaching environment, teaching facilities and teaching activities can produce a large amount of noise. The noise can influence students' listening and affect the communication between teachers and students, it can pro-

duce negative effect for students' learning. The teachers will lead vocal strain for a long time to raise his voice. Personnel arrangement sensors node in the classroom, it can monitor all corners of the noise exceeds, once it exceeds the warning value, it will alarm notification to relevant departments. The light will affect the eyesight of students, Personnel install light sensor in the classroom, which can monitor the light brightness and automatic adjustment of classroom lighting brightness and computer screen brightness, according to outdoor light intensity, it can adjustment curtain height. The sensor can also adjust ventilation and air conditioning temperature according to the indoor carbon dioxide concentrations.

To sum up, the new teaching mode has a significant advantage, and along with its application in the teaching continuous in-depth, it will produce a more far-reaching influence for the development of education.

4. Conclusions

Although the Internet of things in the field of education research is little, but along with the Internet of things technology mature increasingly and people attention degree rise ceaselessly, its application in education will be more and more widely. It will help to optimize the learning environment, abundant learning resources, improve learning, reduce the management cost, improve management efficiency and speed up the process of educational modernization. We believe that the era of the Internet of things of education is coming.

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