

Research on the Construction and Method of Mobile Intelligent Interactive Teaching Environment Based on Big Data Visualization

HuSong^{1, a}, Yanmei Hu^{2, b, *}

¹ Chengdu Medical College, Chengdu, Sichuan, 610083, China

² Chengdu Medical College, Chengdu, Sichuan, 610083, China

^a756005653@qq.com, ^b13965808@qq.com

*corresponding author

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Abstract: With the popularization of mobile network technology and the rapid development of mobile device terminals, the use of mobile technology in education has gradually become a new normal. How to use mobile technology to build an intelligent teaching environment and realize interactive teaching is a hot issue at present. This paper constructs a mobile intelligent interactive teaching environment, which provides a real-time interactive classroom teaching assistant tool for teachers. Students can use mobile devices as the carrier of classroom interaction to carry out mobile learning, classroom interaction, real-time evaluation and feedback. Teachers can use the platform to carry out classroom in class test during the course of teaching, and immediately enter the results of in class test Line statistical analysis, through this real-time interaction to achieve the dynamic evaluation of classroom teaching effect, and in view of the shortcomings of the existing mobile teaching environment in data analysis and processing, put forward the use of big data visualization analysis technology to analyze teaching data, the visualization display of data can provide decision support for teachers and teaching managers in the teaching process.

1. Introduction

With the popularization of mobile network technology and the rapid development of mobile device terminals, the use of mobile technology in education has gradually become a new normal. The classroom has become a technology aggregation environment. How to use mobile technology to build a digital teaching environment and carry out mobile teaching is a hot issue of current scholars. The traditional mobile learning platform has been unable to meet the needs of higher education. The traditional teaching environment lacks the collection and analysis of learners' feedback data. The design of teaching content is mostly based on the level of information presentation and knowledge transmission. Teaching is a one-way output process, lacking classroom interaction design, which is difficult to mobilize learners' interest in learning and affect teaching results. How to cultivate and strengthen students' communication ability and solve the problems of "lack of interaction" and "difficult information feedback" in the traditional classroom teaching process has become the key to the construction of classroom environment.

Big data is the hottest IT industry vocabulary nowadays. Big data can be summarized as volume, velocity, variety and value. The use of data warehouse, data security, data analysis and data mining around the business value of big data has gradually become the focus of the industry. With the advent of the era of big data, data visualization has become a hot topic, which has attracted great attention. Data visualization can enhance the presentation effect of data, facilitate users to observe data in a more intuitive way, and then discover the hidden information in the data. Visualization is widely used in many fields, such as network data visualization, traffic data visualization, text data visualization, data mining visualization, biomedical visualization, social visualization and so on.

Using big data analysis method and data visualization technology to collect, analyze and process all kinds of teaching process information in the teaching process. In addition, giving full play to the

quick and flexible characteristics of mobile devices in the teaching activities to carry out auxiliary teaching can fully mobilize the enthusiasm of students to participate in the teaching and enable students and teachers to realize interactive teaching, which not only enriches the hands of classroom teaching. In addition, teachers can get more teaching feedback in real time, which provides data support for improving teaching quality and teaching methods.

2. Mobile Intelligent Interactive Teaching Platform Based on Big Data Visualization

The mobile intelligent interactive teaching platform based on big data visualization mainly consists of classroom teaching auxiliary platform, big data teaching information analysis module, data visualization module, teaching information decision-making module and other parts. It provides a real-time interactive classroom teaching assistant tool for teachers and students. Teachers and students use mobile phones, pads and other mobile devices as the carrier of classroom interaction. During the teaching process, teachers can carry out classroom follow-up test at any time, and immediately make statistical analysis of the results of the follow-up test. Through this real-time interaction, dynamic evaluation of classroom teaching effect is realized. Estimate. At the same time, we analyze the teaching data from the perspective of big data visualization. The analyzed data can provide support for teachers to summarize teaching experience, analyze learning process, adjust and improve teaching focus, etc. at the same time, visual analysis of data can also provide real-time learning records and summaries for students, and provide decision support for students to improve learning methods and improve learning efficiency.

The mobile intelligent interactive teaching platform based on big data visualization can collect all kinds of teaching evaluation data in real time and conveniently, and use big data analysis method to sort out and analyze these data, which can reflect the quality and level of teaching activities from different angles, and provide data support for the improvement of school teaching management level and teachers' teaching quality and efficiency. The statistical analysis table of visual teaching information is shown in Table 1.

Table 1. Comparison of test results

Data analysis object	Visual chart form	Data analysis content	Purpose of data analysis
Personal information of Teachers	Broken line diagram	Reflect the distribution of teacher's personal information through graphics	Analyze the composition of Teachers
Student information	Pie chart	Reflect the distribution of students' personal information	Analyze the composition of Student
Completion of learning tasks	Bar chart, striped chart, pie chart	Reflect students' learning status information	Reflect students' academic completion
Online Autonomous Learning	Bar chart, striped chart, pie chart	Reflect students' autonomous learning information	Reflect students' Online Autonomous Learning
Student achievement	Histogram, striped chart, score scatter chart	Show the relationship between students' performance and learning process	Analyze and reflect the relationship between students' learning process and achievement

2.1 Main Function Modules of the Platform

Classroom real-time interaction module: This module provides a real-time and efficient interaction mode for teachers and students through real-time online testing and parallel statistical data. Through statistical analysis of data, it can be an effective means for teachers to conduct real-time evaluation on

the teaching quality and students' mastery of knowledge points. The system operation results are shown in Figure 1.

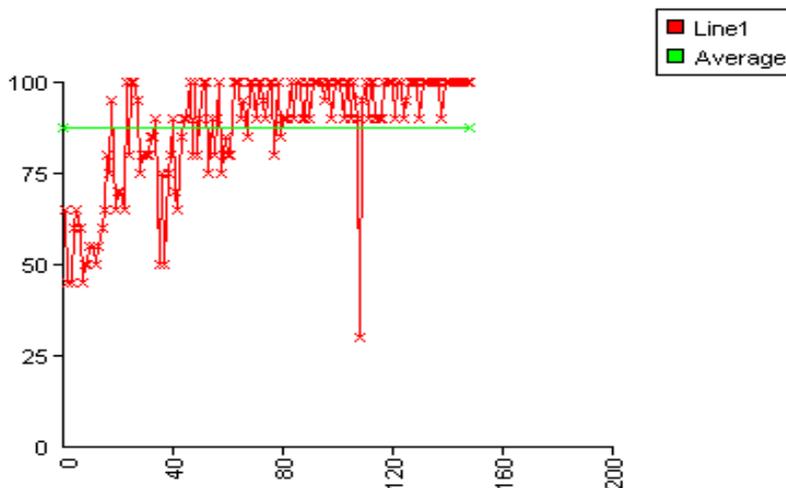


Figure 1. Classroom Real-time Interaction Module

Automatic roll call module in class: the module automatically counts the attendance of students in class through student login, realizes automatic roll call in class, and changes the teaching attendance mode in which the teacher orally roll call forms the attendance record of students in class under the traditional teaching mode.

Classroom teaching evaluation module: the platform also provides teaching effect evaluation function, mainly including supervision experts, peer teachers mutual evaluation, students in class real-time evaluation function. The platform can collect all kinds of teaching evaluation data in real time and conveniently. By sorting out and analyzing these data, it can reflect the quality and level of teaching activities from different angles, and provide data support for the improvement of school teaching management level and teachers' teaching quality and efficiency.

Exercise module of after class question bank: students can complete the exercise questions of corresponding chapters online after class. Each completion will be used as the data of usual performance, and as one of the important assessment methods of course usual performance.

Classroom practice score query module: students can query their usual classroom practice scores to find out their own learning deficiencies.

Teaching and learning effect analysis and visualization module: this function module uses the big data analysis and visualization method to analyze the data comprehensively, and carries on the graph visualization, which is convenient for teachers and students to evaluate the teaching and learning effect.

2.2 Technical framework of the platform

Technical framework of the platform is shown in Figure 2.

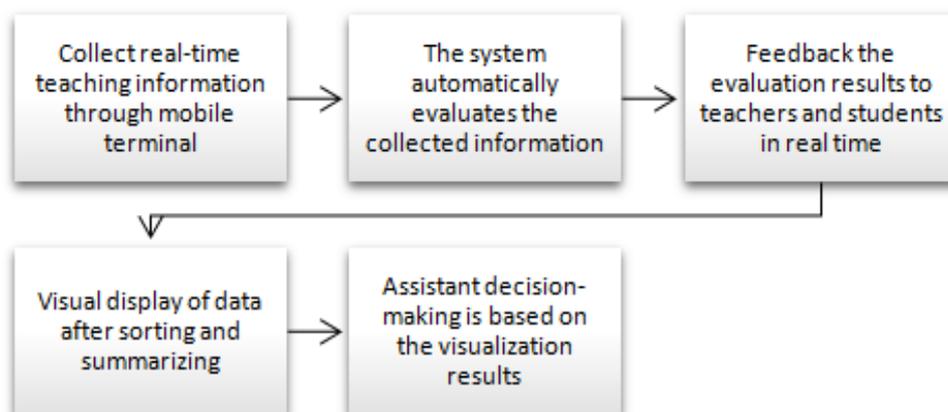


Figure 2. Technical Framework of the Platform

3. Implementation and Performance Test of Mobile Intelligent Interactive Teaching Platform Based on Big Data Visualization

In the test phase, we selected 90 students from class 1 and class 2 of 17 level information management and information system major to try out the system, and selected Oracle database course as the application course. On the platform, we used modules such as roll call, online practice, question bank practice, classroom interaction, score query, etc., and received 20000 pieces of test data. The screenshot of system use function is shown in Figure 3.



Figure 3. Screenshot of System Function

4. Conclusions

With the development of teaching activities, the use of mobile intelligent interactive platform can continuously accumulate teaching information. Through big data analysis method and data visualization to analyze and predict teaching process information, teachers can timely collect, analyze and process all kinds of teaching process information in the teaching process, understand students' learning situation, so as to timely adjust teaching content, method and progress according to students' level, further improve teaching level, improve teaching effect and improve teaching Learning quality. Using the quick and flexible features of the intelligent interactive platform, all kinds of analysis information can be fed back to the students' autonomous learning process, and the enthusiasm of students' participation in teaching can be fully aroused, which not only enriches the means of classroom teaching, but also efficiently and scientifically guides students' autonomous learning and improves the efficiency and quality of learning.

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