

# Application of Big Data in Intelligence Classroom Teaching in Universities

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**Abstract:** Smart classroom is a new hot topic in the current research of educational informatization. This paper sorts out the significance of big data in college classroom teaching, the definition and characteristics of intelligent classroom. And put forward the concrete practice of big data analysis in the classroom teaching of colleges and universities.

## 1. Introduction

Information technology can promote the reform and innovation of college education and teaching management, and improve the quality of school teaching and personnel training. Since the beginning of the 21st century, the pace of informationization in China's colleges and universities has accelerated, and it has entered a new stage of smart campus construction. With the application of smart campus information technology such as RFID, two-dimensional code, video surveillance, and pervasive computing, the amount of data generated by university information management systems, card systems, monitoring systems, etc. has grown rapidly. It also includes campus BBS forum, post bar, website click traffic, communication equipment, etc. Using new technologies to effectively analyze and process massive data and extract valuable data and information for reference and decision-making by school teaching management departments and teachers will truly realize the concept of wisdom in higher education and teaching management.

## 2. Application significance of big data in intelligent classroom of university

### 2.1 In line with the requirements of constructivism learning theory for the construction of an ideal learning environment

Constructivist learning theory provides an important theoretical basis for the construction of intelligent classroom. According to the constructivism learning theory, the acquisition of learners' knowledge is the help of others (including teachers and learning partners) under certain circumstances. And use certain learning resources, through meaning construction. The ideal learning environment includes four elements: situation, cooperation, conversation and meaning construction. Wisdom class can meet the higher requirements of constructivism learning theory on learning environment. With a variety of new media, new technologies and smart devices, we can create and display a variety of realistic learning situations for the closed loop of pre-course, in-class and after-school teaching. At the same time, it promotes the three-dimensional communication between teachers and students and students, which is conducive to collaboration and inquiry learning, and helps learners to construct the meaning of knowledge.

### 2.2 Adapting to the profound influence of big data on college education and teaching

The typical thinking in the era of big data is based on the decision-making of data analysis, and data change education is the core of classroom change. In classroom teaching, data is the most significant indicator of teaching effectiveness. For example, the accuracy of student literacy, the correct rate of homework, the number of raises to actively participate in classroom teaching, the number of questions answered, the duration and accuracy, the frequency and duration of teacher-student interaction. Large amounts of teaching data have been generated in classroom teaching. The processing, mining and analysis of these large amounts of data cannot be separated from big data technology and methods. Based on the learning analysis of big data, the classroom

relies on data to speak and intuitive data to judge students' learning behavior and make teaching decisions. Big data has made profound changes in classroom teaching in colleges and universities.

### **2.3 Meet the needs of “teaching students according to their aptitude” for technical support.**

In traditional classroom teaching, each teacher is facing dozens of students at the same time, so it is difficult to grasp and take care of the individual differences of each student in time. In the limited teaching time and space, it is difficult to specify the “factors” of students to everyone. With the support of modern information technology, the smart classroom effectively changed this situation based on the whole process dynamic learning evaluation and intelligent push. Through the pre-class and class-based promotion of rich media learning materials and homework, real-time assessment and feedback, accurate grasp of each student's existing level, easy to target, accurate teaching, and truly achieve “teaching students according to their aptitude.”

### **2.4 Adapt to the trend from “process reversal” to “structural change”**

The basic tenet of flipping the classroom is to reverse the traditional teaching process based on the application of teaching video, from “learning after learning” to “learning after learning”. The era of big data emphasizes data analysis and application, and comprehensive support based on information technology such as big data and smart push. From general viewing video to pre-class preparation, assessment analysis and feedback. From “learning first and then teaching” to “learning as teaching”, from the control of the classroom to dynamic learning analysis based on data, instant feedback and teaching “wit” realized accordingly. Turnover class has changed from the early “process reversal” 1.0 era to the “structural change” 2.0 era, thus realizing the “wisdom class” in the big data era.

## **3. Definition and Characteristics of Smart Classroom**

### **3.1 Definition**

At present, there are three definitions of the concept of intelligent classroom based on the perspective of informatization. One is based on the application of Internet of Things technology. This definition emphasizes the “intelligent” perception characteristics based on the Internet of Things. The second is based on e-book package applications. This definition emphasizes the characteristics of “mobile” smart terminals based on e-books. The third is based on cloud computing and network technology applications. This definition emphasizes the characteristics of the “personalized” learning application in the classroom.

Here we combine the actual development and application, and propose a smart classroom concept based on dynamic learning data analysis. That is, smart classroom refers to intelligent and efficient classrooms created by using next-generation information technologies such as big data, cloud computing, and the Internet of Things. It is based on the analysis of dynamic learning data and the application of “cloud end” to realize the instantiation of evaluation feedback, three-dimensional communication interaction and intelligent resource push. We will comprehensively change the form and content of classroom teaching and build an information-based classroom teaching model in the era of big data.

### **3.2 Main features**

Compared with traditional classroom, intelligent classroom based on dynamic learning data analysis and “cloud end” application has important characteristics and innovative value in technology and teaching application. The main features are:

**Data-based classroom:** everything depends on data to speak, based on students' learning behavior, big data mining analysis and decision-making, using intuitive data to understand students' knowledge level, and accurately grasp the first-hand learning information from students.

**Efficient interactive classroom:** Using intelligent mobile learning tools and application support platform, the communication and exchange between teachers and students, students and students are more three-dimensional, and instant communication and interaction can be carried out without

barrier.

**Dynamic and open classroom:** With the help of emerging information technology and various intelligent terminals, the classroom system transcends time and space restrictions, enabling more open classrooms and more open classroom activities, allowing pre-class, in-class and after-school integration.

**Cooperative inquiry classroom:** The group negotiation, collaborative learning, collaborative group service can help learners with the same learning needs and interests automatically form a learning community. Teachers can use the platform to conduct real-time digital evaluation and timely feedback on team cooperation.

**Personalized learning classroom:** Through the pre-study assessment analysis and the on-the-spot quiz, the students can evaluate the individualized learning ability of the students, and formulate the teaching plan and counseling strategy in a targeted manner to truly realize “one-on-one”. Personalized teaching.

**Teaching wit classroom:** Based on dynamic learning data analysis and immediate feedback, teachers take tactful actions, timely adjust the pre-class teaching design, optimize and improve the classroom teaching process, and fully reflect the teacher's teaching wisdom and teaching art.

## **4. Application of Big Data Analysis in College Smart Classroom Teaching**

### **4.1 Realizing Dynamic Learning Analysis and Evaluation**

Using big data learning analysis technology to provide dynamic evaluation and feedback, teachers can quickly make dynamic diagnosis and evaluation of the whole learning process of students. For example, teachers can diagnose the students' existing knowledge level and optimize the teaching design scheme by preparing homework and evaluating before class. Through the classroom practice and detection system, real-time detection, statistics, rapid analysis and feedback of students' classroom learning effects, timely adjustment of classroom teaching progress and content. Through the after-school homework data analysis and reflective evaluation, it is convenient for individualized counseling for students to achieve continuous improvement of teaching.

### **4.2 Build a new classroom form and learning environment**

The in-depth application of modern information technology in smart classroom teaching has brought about major changes in the classroom form. New technologies, new media and smart terminals provide learners with a rich cognitive tools and support environment, creating more open classrooms and more open classroom activities for teachers and students. For example, there is no traditional platform and blackboard in the wisdom class, desks are arranged in groups for discussion, multiple interactive cooperation methods are adopted in the teaching process, and teachers teach for students and directly integrate into group discussions. Teachers can use their mobile terminals (mobile phones, PAD) to write and project to the large screen in the classroom. The PPT commonly used by teachers can carry out arbitrary handwriting, labeling, deduction, etc. The traditional classroom has become a digital “experience hall” and “experimental field”.

### **4.3 Optimizing Cognitive Objectives and Teaching Design**

In the way of determining teaching objectives, the intelligent classroom based on big data learning analysis can grasp the learning analysis data from front-line students instantly and accurately according to the digital preview and feedback of preview evaluation before the class. According to this, the teaching goal is to be based on the student's “recent development zone” design problem, to be targeted, and to teach students in accordance with their aptitude.

### **4.4 Reorganized teaching and process structure**

Relying on the intelligent classroom information platform, through the big data learning analysis and intelligent information technology, the communication between teachers, students and students is more three-dimensional, and real-time communication and interaction are accessible. Learning resources to achieve rich media, intelligent, fragmented, push and real-time synchronization as

needed. The teaching process is from “teaching before learning” to “learning before teaching” and “learning before teaching”. Stratified teaching is implemented. More personalized classroom teaching is organized through micro-class, group discussion, precise comments and stratified exercises. As a result, the traditional teaching structure has undergone major changes.

#### **4.5 Changing Classroom Teaching Methods**

Great changes have taken place in the teaching methods of intelligent classroom teaching under the background of big data, from the traditional teacher-centered teaching that emphasizes knowledge transfer to the student-centered teaching that emphasizes ability cultivation. This will help realize autonomous learning, inquiry learning and coordinated learning.

#### **References**

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