Research and Design of Intelligent Teaching Mode Based on Artificial Intelligence Technology

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Abstract：The emergence of smart classroom represents the continuous pursuit of the traditional teaching method for the height under the blessing of modern technology. The integration and development of advanced technology is an important basis for classroom and teaching reform to improve the quality of teaching. Integrating AI technology into the teaching process and creating an efficient and intelligent classroom has become the future development trend. In practice, feedback analysis based on big data combined with artificial intelligence technology is an effective way to build a modern smart classroom, which can gradually achieve the classroom learning analysis goal of cooperation between computer and people, range and optimization.

Keywords：Artificial Intelligence; Intelligent Teaching Mode; Teaching System

The traditional classroom teaching analysis is mainly based on the time sample of manual coding, which is too dependent on experts, and the analysis efficiency is low, so it is difficult to promote. In order to overcome this dilemma, the teaching analysis based on artificial intelligence should take a path from the shallow concept of artificial intelligence to the promotion of human-computer cooperation. The teaching case database, text and video analysis parameter set and teaching analysis system supported by multi-source data should establish an analysis framework composed of multivariate methods, combining events and time scales.

1. Application of artificial intelligence technology in intelligent teaching

In the 1970s, the development of quantitative analysis of teaching was the most vigorous. Video teaching and the so-called "time sampling method" were introduced. The focus of the research is to quantify the behavior and interaction of teachers and students, and other typical classroom analysis methods. However, no matter which coding method is used, there are some problems similar to the traditional analysis method: the technical difficulty is great, and the production efficiency is low. For example, in a 40 minute class, different coding techniques will use different time samples, such as 15 seconds and 3 seconds. No matter which method, will produce a lot of data coding, and need to have professional knowledge reserves of personnel for manual analysis, it is obvious that this method is time-consuming and inefficient. With the development of technology, many professionals have begun to look for ways to improve efficiency and develop corresponding algorithms to replace manual analysis. Just importing the collected classroom samples into the computer, and the computer will automatically generate the required characteristic curve. This step can greatly improve the efficiency of smart classroom development. But generally speaking, the interaction analysis in class still stays on the technical road of manual coding and software statistics, and there is no progress in research ideas and effects.

After nearly 50 years of development, the importance of classroom teaching analysis has been widely valued by the education sector. Among them, some variables that record the classroom process after standardization are included in the analysis scope, which improves the application scope of classroom teaching interaction. Classroom interaction research not only began to play a role in the

classroom itself, but also began to play a role in the quality assurance of education and personnel training. It is essential to carried out intelligent, effective, large-scale classroom research by using big data, cloud computing and artificial intelligence technology.

2. Practical application of artificial intelligence in intelligent teaching

2.1 The role of AI technology in teaching framework design

Before forming a mature education environment and analyzing the research framework of classroom learning, AI technology is actually implemented in the construction of smart classroom.

Under the intelligent teaching mode, the formulation of teaching framework should be unified with the learning objectives of each stage and grade, and whether the formulation of teaching objectives is appropriate and in line with the students' stage learning characteristics. Whether knowledge points can be classified by features, it should be connected with students' learning in the past, and should also conform to students' cognition in the past. At the end of each teaching, we should link up a reflection for students after class and a reflection for teachers, so that students can further think and summarize what they have learned, which also allows teachers to have a review of their own teaching process, in order to fill the gaps.

2.2 Application of AI technology in intelligent classroom content design

In the analysis of classroom resources, text and video are the main forms of classroom resources, because teachers need to use the lesson plan, students use textbooks, exercise books, teachers and students have reflection on the classroom, comments, these are generally text resources, classroom records are video resources.

Gradually, many new technologies begin to appear, such as big data and cloud computing, knowledge mapping, etc. their addition is very beneficial to the construction of smart classroom. Education, like many other disciplines, has gone through the process from empirical science to theoretical science, then to computing science, and finally to data intensive science. The change from problem oriented to algorithm oriented is of great significance to educational research.

2.3 Analysis of classroom teaching based on artificial intelligence

The interactive video between teachers and students in the classroom is an important part of the smart classroom, and also the most time-consuming resource to be analyzed. In recent years, computer vision technology has developed rapidly in the field of artificial intelligence. Because deep learning method is much more efficient than traditional methods, deep neural network and convolution neural network have been widely used in video feature extraction and recognition. It improves the efficiency of video recognition. Because the position of teachers and students in the classroom often changes, they will look back at the camera or face the camera at any time. Students will read, write, use portable educational equipment, or do other actions. They must show books under the teacher's explanation, operate with electronic board and other behaviors, which must be combined with the appearance of the class, so that they can learn by facial recognition or behavior alone. First of all, we classify the classroom learning scenes in the video, distinguish the main interactive devices such as electronic whiteboard and portable tablet computer, and automatically identify and calculate the behavior of teachers and students in the classroom.

Smart classroom has realized the modules of test image extraction, student monitoring, behavior detection, behavior statistics and data generation. Classroom behavior analysis system uploads the recorded video of learning activities through the client, and the server receives the recorded video, calculates it in the cloud, and feeds back the recognition results to the client to identify and calculate the behavior of teachers and students, so as to support the analysis of classroom learning activities.

Activity is an intuitive learning process in the course, and it is also the text of the teaching video itself. However, not all activities can play a teaching role. Only in line with students' internal learning needs can we achieve the purpose of improving cognitive ability, attract students' attention, and set appropriate goals for students' learning. It can review what they have learned repeatedly, create stimulating conditions, and point out the direction for students' learning, so as to provide learning guidance for students, timely feedback on teaching and learning results, those are all effective external stimuli to promote classroom teaching results.

3. Application scenarios of artificial intelligence in smart classroom

3.1 Optimizing the curriculum and teaching structure analysis

The purpose of teaching diagnosis is to improve teaching. Intelligent classroom uses artificial intelligence technology to redefine the quantitative research concept of "basic learning events", that is, the computer identifies the sequence of events and classifies the types of events. Such analysis results can effectively help teachers to investigate the application degree of the two teaching concepts in the actual classroom, and help teachers to understand which learning events and learning methods can improve

the relationship between the leading disciplines and the disciplines taught, as well as the time relationship, and enhance the feasibility and scientificity of intelligent classroom.

3. 2 Optimizing the evaluation system of teachers and students

Teacher evaluation usually includes quantitative evaluation according to the performance indicators assigned to the class, qualitative evaluation after observing the class and the combination of the two kinds of evaluation. In the actual use process, no matter which method is used, the implementation mode of this evaluation method should be top-down, and according to a set of pre-determined evaluation criteria for scoring and comment. In fact, this kind of evaluation method also has a lot of disadvantages. The places that are not covered by the pre designed evaluation system are invalid for the system, which will affect the applicability of the evaluation system of smart classroom.

The bottom-up approach not only provides the basis for the change of educational evaluation methods, but also brings together educational experience and wisdom from different perspectives to help people reach a consensus on educational evaluation. It provides a new perspective for classroom evaluation system.

4. Conclusion

Based on the development path of teaching analysis of artificial intelligence, this paper constructs the basis of teaching analysis based on artificial intelligence from teaching case analysis, and applies artificial intelligence technology to practice. What needs to attract people's attention is that there are several problems in the combination of artificial intelligence technology and education to realize intelligent teaching: first, the teaching community has not yet formed a common evaluation standard of educational analysis index and reference characteristics. Under the standard situation, for different students and different situations, whether the evaluation system is suitable or not needs to be proved by practice. Second, there are many topics that are not suitable for teaching. Some courses have a large span and a variety of teaching modes. Today's technology can't achieve the goal. Future research is expected to further integrate more excellent high-tech, carry out research on computer vision, language recognition and other aspects, in order to improve the scope and accuracy of education data collection, and provide new insights and methods for education analysis of smart curriculum.

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