



Design and Research of Blended Teaching Mode Based on Artificial Intelligence

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Abstract. Blended teaching, which has flourished during the pandemic, also faces teacher burdens. Overweight, insufficient student supervision and other problems. Design a hybrid based on educational artificial intelligence. Teaching mode, and from the teaching process design, teaching resources construction, teaching management improvement. And the construction of higher vocational teachers and other aspects of the teaching mode of the specific implementation of the policy to create a truly modern intelligent blended teaching platform to provide from the front line teaching the conception of the division.

Keywords: Artificial intelligence · Teaching method design · Higher education

1 Introduction

With the advent of the Internet era, blended teaching has been rapidly promoted and applied. Especially since 2020, due to the epidemic, teachers have reorganized and integrated teaching resources with the help of various modern educational tools under the call of “no school suspended”, making blended teaching brilliant. With the development of comprehensive teaching, many problems of mixed teaching have emerged gradually. Based on the in-depth study of the problems faced by blended teaching and the development status of educational artificial intelligence, this paper discusses the integration path of the two, and then designs a set of new blended teaching mode based on educational artificial intelligence. The blended teaching mode is guided by the teaching theories of behaviorism and constructivist learning theory. It optimizes the organization, integration, presentation and application of teaching resources with the help of a variety of modern educational technology means, deeply integrates traditional face-to-face classroom teaching with modern technology, and seeks to complement each other’s advantages. To achieve the best teaching efficiency and effect of a teaching model [1]. The key of blended teaching is “how to mix”, that is, how to carry out effective design of blended teaching. Since 2016, blended teaching methods have been gradually carried out in various colleges and universities. More and more teachers use the network teaching platform to implement online and offline blended teaching, which expands the teaching time and space, facilitates the resource sharing and interactive communication between teachers and students, and achieves good teaching effects. Since 2020, due to

the epidemic, blended teaching has entered the full stage. At this time, the mix is no longer the mix of online and offline, but the mix of a variety of traditional teaching skills and modern technical means, which is a mix of learning forms aimed at improving teaching efficiency. In this context, through the investigation of mixed teaching status of some teachers and students in higher vocational colleges, it is found that mixed teaching is widely used, but there are still some problems [2]. First, there are some problems in blended teaching, such as students' supervision and control is not timely and teaching effect depends too much on students' learning initiative. The polarization of students in hybrid teaching in higher vocational colleges is particularly serious. Second, blended teaching can not realize the intelligent selection of teaching resources, can not realize personalized teaching. Third, the burden of teachers in blended teaching increases significantly, which is not conducive to the long-term comprehensive and effective promotion of this model. It can be concluded from the above problems that blended teaching needs an assistant, who can push different learning according to different students' learning conditions before class [3].

Learning resources can monitor and report students' learning situation in real time in class, and also help teachers deal with some simple questions, homework correction and other tasks after class. With the rapid development of artificial intelligence, this assistant can be completely artificial intelligence to do.

2 Instructional Design Algorithm Based on Artificial Intelligence

Many literatures have made detailed analysis and research on the ecology of educational artificial intelligence. On the basis of these studies, the author, starting from the perspective of front-line teachers, mainly aims at the computer courses in higher vocational colleges, and carries out more specific and practical research design on the integration path of blended teaching and artificial intelligence. Functions such as intelligent learning guidance, intelligent resource push, intelligent response assistance and monitoring are integrated into the design of hybrid teaching before, during and after class, thus forming a new teaching model, as shown in Fig. 1. Firstly, based on the principle of primary teaching and from the actual course teaching, this paper analyzes and studies the intelligent demand of blended teaching in the teaching research preparation stage, teaching implementation stage and teaching summary stage [4].

Secondly, it fully analyzes the advantages of educational artificial intelligence, and reasonably applies artificial intelligence technologies such as intelligent evaluation, intelligent learning guidance, intelligent response and intelligent diagnosis into teaching, and finally forms a deep integration of the two.

$$y = \sigma(\omega x^T + b) \quad (1)$$

1) The integration of the preparation stage of course research and artificial intelligence is reflected in the assessment of learning situation and the push of teaching resources. At the beginning of the course, teachers need to make a preliminary analysis of the whole learning object and the course, make full use of large data technology, conduct individual statistics and overall induction of students' previous learning status, and summarize the basic learning situation of this learning group. These jobs can be paid

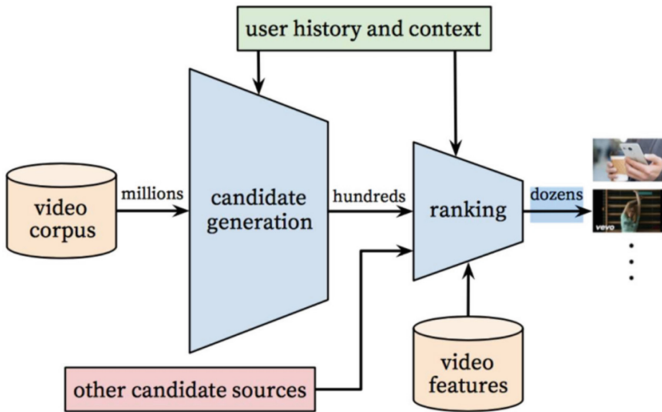


Fig. 1. Artificial intelligence algorithm flow

for by artificial intelligence. After the teachers get the analysis results, they can choose the teaching plan according to the students' situation. In addition, it is expected that a more intelligent platform can analyze the course situation while analyzing the learning situation, actively search for relevant teaching resources, and provide learning resources that can match the learning situation, and then push them to teachers for selection, so as to realize the network sharing of course resources and further reduce the pressure on teachers [5].

2) The teaching process of the curriculum implementation stage is divided into three parts: before class, during class and after class [6]. ① The intelligent demand before class mainly lies in targeted learning situation assessment and resource push. Different from the assessment of learning situation in the preparation stage of teaching, the students' portraits during this period focus on personalized evaluation. Each student's learning status is different, the knowledge structure is also different, teachers need to use artificial intelligence means to understand each student in detail, that is, need to give each student a portrait; According to the portrait, students are provided with more targeted resources, so that students can check the gaps and make up for them, and better accept new knowledge. ② The intelligent demand in the class is mainly reflected in the intelligent tutoring and intelligent monitoring feedback. The class is mainly used for teaching new knowledge and answering questions. Whether it is live or recorded online teaching during the epidemic, or offline face-to-face multimedia teaching at ordinary times, teachers can only explain to all students. For individual students' questions, assistants need to help explain, which requires the introduction of AI intelligent tutors. Some common questions, especially common questions in computer programming and operation, can be mastered by AI tutors through machine learning.

3 Educational Design Simulation Experiment

3.1 Data Preparation and Environment Construction

In order to meet the technical requirements of educational artificial intelligence, teaching and learning resources will undergo profound changes from content to form. 1) The selection of content should be more diversified and hierarchical [7]. With the development of blended teaching, the teaching object will change greatly, gradually from school teaching to social teaching. Aiming at different levels of teaching groups, it is very important to construct the level and diversity of teaching resource content. Higher vocational colleges should not only prepare the undergraduate resources of the transfer class, but also prepare the teaching and learning resources of migrant workers and soldiers. The former requires more theoretical knowledge, while the latter requires manual operating knowledge. At the same time, in order to adapt to the 1 + X certificate system, but also vigorously supplement different levels of exercises for students to choose to use.

$$\partial_j^L = \frac{\partial C}{\partial z_j^L} = \frac{\partial C}{\partial a_j^L} \times \frac{\partial a_j^L}{\partial z_j^L} = \frac{\partial C}{\partial a_j^L} \sigma'(z_j^L) \quad (2)$$

2) The arrangement should be more targeted to achieve tagging, so as to cooperate with intelligent search and intelligent push. In order to better adapt to the resource push of artificial intelligence, the arrangement of teaching resources should be more targeted. Teachers should further classify students, arrange resources in more detail, and attach corresponding labels, so as to make artificial intelligence retrieval and push more convenient and lower the error rate [8] (Fig. 2).

3) The form of teaching resources should be developed to the direction of rich media and cloud textbooks to adapt to intelligent tutoring and real-time school supervision. For

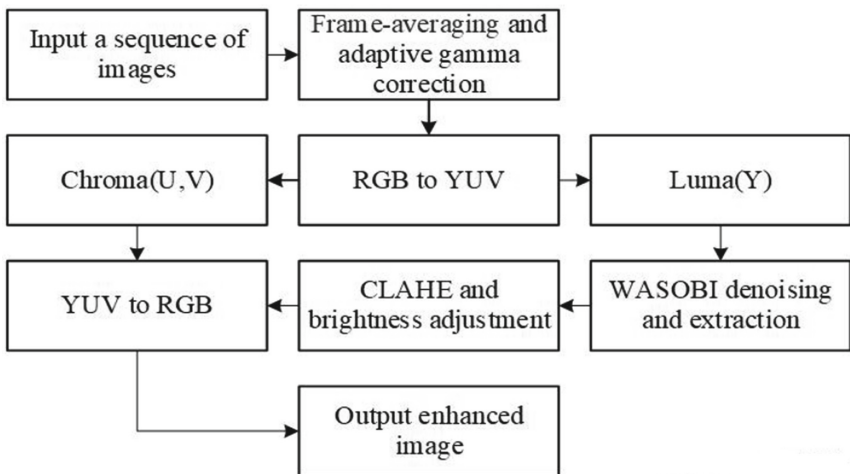


Fig. 2. Artificial intelligence simulation experiment process

operation demonstration resources should be based on video, so that it is more intuitive and vivid; Theoretical learning resources can be supplemented with necessary expanded knowledge documents and links on the basis of teaching videos to enrich resource content. 4) The compilation of supporting textbooks should be more diversified. In addition to vigorously promoted movable page and workbook textbooks [9], we can also try to compile cloud textbooks and micro-lesson textbooks, which are convenient for timely updating and intelligent retrieval and push of textbooks. The previous investigation found that the outstanding problem in the hybrid teaching of computer courses in higher vocational colleges is the problem of teaching management. Vocational college students' self-control is weak, so they need more supervision and supervision. However, multi-level and personalized blended online learning requires students' strong autonomy and consciousness. How to effectively introduce the intelligent assistance and monitoring function of artificial intelligence into online learning, so that online learning can not only meet the needs of hierarchical and personalized learning, but also achieve the monitoring and guidance of students at any time, is an urgent problem for teaching and learning management.

3.2 Experimental Results and Comparison

1) Improve students' information-based learning literacy and cultivate students' online learning habits. Many students come from the face-to-face classroom teaching in high school, but are not used to the online intelligent teaching and cannot make good use of the intelligent teaching platform for learning. If the intelligent teaching can be carried out smoothly, it is crucial for the intelligent learning training of students [10].

$$\delta_j^L = \sum_k w_{kj}^{l+1} \delta_k^{l+1} \sigma'(z_j^l) \quad (3)$$

2) Enrich the forms of network teaching resources. Multi-animation, game, video and other resources, students feel close, can attract their attention. "Xing Qu is the best teacher." Only when students are interested can they take the initiative to learn and online tutoring can be really implemented. 3) Add the anytime broadcast function of intelligent monitoring. The salient problem of online teaching is that students cannot see the teacher face to face, so there is a feeling that they are not in the classroom and are not monitored. Therefore, the appropriate increase of any time broadcast and timely feedback of students' listening status to teachers and students will not only help teachers to grasp students, promote emotional communication between teachers and students, but also encourage students. 4) While moderately enhancing the monitoring of artificial intelligence, students should also have some space for independence and freedom. Especially when training and learning independently, we should dare to let go of our hands to students. Pay attention to the statistical analysis of students' learning feelings and habits, so that students can learn in a state of stress and excitement. Without learning intervention, students will be too relaxed, but too much unnecessary intervention may cause students to produce greater psychological pressure and reverse psychology.

4 Conclusions

Based on the needs of English vocabulary teaching, this study integrates VR technology and situational cognition theory to create a situational English vocabulary teaching environment. English vocabulary teaching based on VR technology can contextualize vocabulary teaching, help students understand the meaning of words through specific and real language environment, promote students' meaningful learning, and enhance students' language application ability. Taking animal teaching as an example and combining with the theory of situational cognition, this paper introduces the specific application of teaching design elements such as situational design, task design and evaluation design in VR teaching environment in detail. The development of information technology has promoted the reform of teaching forms. Diversified and three-dimensional teaching forms can expand students' cognition, enhance students' sense of participation, break the limitation of time and space, and provide more possibilities for the development of education and teaching. In the long run, as the artificial intelligence education platform becomes more and more intelligent, teachers will gradually transform from the imparters of knowledge to the guides, organizers and managers of students' learning, as well as the inheritors of craftsman spirit and the companions of common learning. Because of the introduction of artificial intelligence, the teaching industry which has lasted for thousands of years will face a major change. Vocational teachers should keep pace with The Times, keep learning to adapt to the new teaching needs, and realize the positive transfer of learning. The concrete way to test the learning effect is to communicate what students and teachers have learned. During the teaching process, teachers should observe students' reactions to what they have learned and guide them to describe what they have learned by asking questions, such as: How many kinds of animals have you learned today? Can you describe the difference between a monkey's tail and a rabbit's? Can you describe the characteristics of elephants? And so on. The teacher should give guidance to the deficient parts of the students' answers and help the students memorize the vocabulary comprehensively and profoundly. The evaluation of learning effect can find the deficiencies in students' learning and guide them accordingly. Under the guidance of teachers, students can use what they have learned to communicate with teachers, which can effectively realize the transfer of knowledge.

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