2023 9th International Symposium on Social Science (ISSS 2023)
ISBN: 978-1-60595-422-6

Study on the Construction of a Personalized Teaching Model of Secondary School English Classroom Based on the Cultivation of Critical Thinking Ability Under the Perspective of Big Data

XUEYING ZHAO and XINYU WANG

ABSTRACT

On the background of big data, the author applies constructivism learning theory and conducts research with the goal of developing secondary school students' English critical thinking skills. Teaching mode in the traditional secondary school still follows empiricism. In the era of rapid development of big data, secondary school teachers use big data to analyze a large amount of information, understand students' learning dynamics, adjust their teaching schemes according to their realities, and carry out studies based on students' characteristics. Secondary school teaching mode still follows empiricism. In the era of rapid development of big data, secondary school teachers use big data to analyze a large amount of information, understand students' learning dynamics, adjust their teaching schemes and carry out teaching according to students' characteristics to guide them to develop critical thinking skills in it.

ANALYSIS OF THE CURRENT SITUATION

In the past, personalized teaching was an idealized state in education. However, the previous teaching mode is difficult to collect data effectively and fails to make an effective comparison, so the analysis function and the cultivation of students' critical thinking ability are lacking, causing some teachers to limit it to test results, and the goal of personalized teaching falls through. In general, personalized teaching based on the cultivation of critical thinking ability requires data and information as support, but the workload of collecting data and information is large, and other technological means such as big data technology analysis are needed as assistance to promote the realization of the cultivation goal.

Xueying Zhao, Xinyu Wang
School of Western Languages and Cultures, Harbin Normal University, Harbin, China

The Prospective of Combining Big Data Technology and Secondary School English Classroom

The development of artificial intelligence provides superior conditions for current teaching, and teachers can use big data technology to create personalized teaching models and integrate them into secondary school classroom teaching. In recent years, many European and American countries have shown a new trend in the field of general education: students choose their own learning content, set their own learning goals, implement mobile learning groups, and promote independent learning, and students' potential for independent learning will be better developed. And in the process of creating personalized and efficient classrooms, English teachers make full use of the advantages of big data to enrich teaching resources and methods, foster students' thinking skills, create a good learning atmosphere, and truly develop students' listening, speaking, reading and writing skills.

Advantages of Personalized Teaching Mode in Secondary School English Classroom Under the Perspective of Big Data

Based on the current education situation in secondary English teaching classroom, forming the new and high-efficient teaching mode is necessary and indispensable. Obviously, there are two main advantages in personalized teaching mode based on big data. The former is establishing a personalized English classroom based on big data, and the latter is promoting students' personalized teaching.

ESTABLISHING A PERSONALIZED ENGLISH CLASSROOM BASED ON BIG DATA

Under the traditional education model, teachers, students, teaching contents and teaching management are all standardized, especially lacking the cultivation of students' critical thinking ability. Teachers use the same teaching strategies when teaching different students, which can lead to different results due to differences in students' understanding and receptivity. Personalized teaching based on big data to develop students' critical thinking skills can be a good solution to this problem. For example, the system can identify students' "learning problems" and summarize their learning difficulties based on their performance in English practice as reflected by big data, and teachers can make reference to the report on students' English practice completion to improve teaching and learning, achieving efficiency and personalization for students. The teacher can also create a learning program that is specific to the student based on the level of difficulty of the subject and the difference in their own understanding. The combination of the two is designed to create a personalized secondary school English teaching that combines "teaching and learning" and is conducive to cultivating students' critical thinking skills.

PROMOTE STUDENTS' PERSONALIZED LEARNING

The focus of teachers' teaching is no longer to unilaterally impart knowledge, but to let students learn independently, that is, to cultivate students' independent learning ability and logical thinking ability. Big data can provide more functions for the classroom and help students develop personalized learning styles scientifically through big data, as well as provide them with appropriate and exclusive exercise databases, which is of great significance to strengthen the learning process of each student. Personalized education based on big data optimizes personality scientifically and systematically through character, psychological and learning behavior analysis and diagnosis to fully develop students' personal strengths according to their personality traits and interests, making their individual abilities more outstanding.

RESEARCH OBJECTIVES

With the support of big data technology, teachers can understand students' knowledge mastery and application, identify the weaknesses in learning, and find students' "learning problems". Teachers can analyze the teaching process and simultaneously guide students to participate in it. On the basis of specific problems, teachers guide students to develop their critical thinking skills in the process of participation, learn to analyze and solve problems by themselves, and realize the innovative development of students in teaching activities, so as to compensate for the weaknesses in the knowledge system and promote the simultaneous development of students' innovative ability and innovative thinking.

RESEARCH METHODOLOGY

The study applies constructivism learning theory, which states that teaching is not the transmission of knowledge, but the processing and transformation of knowledge. In the learning of knowledge, different learners will have a different understanding of the same proposition, and the understanding is constructed by individuals based on their own knowledge experience; in the application of knowledge, knowledge does not precisely summarize the laws of the world and needs to be recreated for specific situations in specific problems. Teachers and students need to work together to explore certain problems and to communicate and question each other in the process of it. Meanwhile, teachers create ideal learning contexts for students, enhance cooperation among students, stimulate students' analytical and reasoning thinking activities as well as their critical thinking skills, and promote students' own active meaning construction. Student agency, real contexts, collaborative learning, and adequate resources are important conditions for promoting teaching and learning. Constructivism advocates learner-centered learning under the guidance of the teacher, which emphasizes the cognitive subjectivity of the

learner without neglecting the guidance of the teacher. In this way, the similarities and differences between constructivist theory and personalized English teaching based on big data are explored, and the relationship between teachers, students and big data is analyzed, so that a positive circular system can be constructed with teachers, students, teaching contents and media interacting around big data, as the principal part.

RESEARCH CONTENT

Interactive Generation of Personalized Data Platform

With the assistance of the intelligent teaching platform, various "teaching" and "learning" behavioral traces exposed by teachers and students in the process of classroom teaching are constantly and accurately recorded by intelligent teaching platform and wearable devices, etc. This continuous interaction between teachers and students and the environment (online teaching environment and offline teaching environment) contributes to the dynamic generation of teaching big data. Teaching big data consists of "teaching" data and "learning" data. "Teaching" refers to data related to teachers' tendency to ask questions, share resources, correct homework, analyze exams, etc. "Learning" refers to data about students' information access, classroom performance, question answers, online problem solving, test scores, etc., so as to develop students' critical thinking skills.

Storage of Personalized Teaching Media

"Wearable devices can sense changes in students' behavior in real time and obtain their learning behavior data and psychological data without their awareness, track their whole learning process, and promote students to develop their critical thinking skills. In addition, in order to improve teaching efficiency and reduce teachers' workload, teaching materials and students' homework can be presented in advance in the form of text, pictures and videos on the intelligent teaching platform for both teachers and students to use. During this process, teachers can receive various changes from students and make timely classroom responses to guide students to develop critical thinking skills.

Customization of Personalized Teaching Contents

In order to cultivate students' thinking ability, the intelligent teaching platform has designed the relevant learning sections of phonetics, grammar, writing and vocabulary for students, so that students can gradually overcome each section according to their own learning level, thus realizing efficient learning even when they are not in school. For example, in the phonetics section, students can have English conversations with virtual characters in different contexts and follow along with the textbook text module and correct pronunciation online with artificial intelligence, which greatly ensures the quality of students' pre-study and improves their learning efficiency. Teachers can visually analyze each student's learning situation one to one, based on various statistical images

such as tree diagrams and pie charts generated by big data, so as to adjust teaching programs for them. Students receive exclusive customized learning content and materials from teachers, and after each assignment and test, students receive error sets, good exercise sets and example exercise recommendations from the intelligent teaching platform. Students can do unlimited online questions, while big data will count which questions students get wrong the most, so as to analyze which knowledge point students have not mastered well, and feedback on the data to the teacher for adjusting teaching strategies. This step is helpful to develop students' thinking ability and let them learn independently. The teacher is able to "teach people how to fish" to a greater extent and truly develop students' critical thinking skills.

Implementation of Personalized Teaching Decisions

With the analysis technology of teaching big data, teachers can transform the teaching behavior data collected in the teaching process into valuable information to make relevant teaching decisions, which helps teachers realize personalized teaching and cultivate students' critical thinking ability. Big data analysis technology plays an important role in the construction of teachers' teams and in improving the quality of education and cultivating students' critical thinking skills. Teachers in secondary schools are not only the leaders of school education, but also the subjects of curriculum construction and reform, and they are responsible for cultivating students and improving their comprehensive quality. They should not only be familiar with and master professional knowledge, but also need to have a certain degree of theoretical knowledge about big data technology analysis, so that they can use big data technology to analyze teaching behavior in practice and then help students solve practical problems.

Personalized Evaluation and Feedback

In the terms of teachers, after the personalized course has been implemented for one week, teachers will receive the weekly report of students' learning analysis automatically generated from big data, and teachers can visually analyze whether the personalized course needs to be modified based on the images generated from the comparative data of the past two weeks in the report. In the terms of students, students will also receive their own learning and test analysis after each assignment or each test, so that they can clearly identify their own vulnerabilities, such as which knowledge point's exercises are most wrong, clearly grasp their own "learning weak points", and develop their own thinking skills, so that they can dynamically adjust their own learning strategies and methods. In this process, students' critical thinking skills are well cultivated, and they can consciously use their knowledge in class and feedback from class to identify and think about problems. The process of big data analysis is also the process of evaluating students' learning effectiveness. By analyzing students' performance, teachers can learn what they need to improve and provide a basis for improvement; by communicating with parents and providing feedback, they can help parents understand their children's learning condition in time. At the same time, the use of big data also promotes the improvement

of teachers' teaching quality and classroom efficiency and can be used as one of the data sources for the analysis of students' learning conditions.

CONCLUSION

Through data accumulation, a database can be formed and then analyzed to find potential problems, predict future trends and explore educational needs to achieve effective management of the teaching process, teachers' professional development and students' growth. Research activities such as personalized learning and accurate teaching quality monitoring through the means of big data can effectively improve school governance capacity and level, and then promote the overall educational quality of schools. The advent of the big data era makes it easier to achieve accurate personalized teaching in secondary English classrooms, which helps teachers comprehensively monitor students' learning effects, quickly identify problems, and promptly adjust their teaching designs. The construction of a personalized teaching system for secondary school English makes the form of English teaching more diversified, personalized and discursive. Beyond the classroom, it helps to compose diversified forms of practice, such as using wearable devices and intelligent teaching platforms to customize personalized teaching content and form students' "exclusive exercise databases". At the same time, it realizes efficient feedback from teachers and students on classroom knowledge, accurately capturing teaching "weak points" and effectively achieving teaching goals.

ACKNOWLEDGEMENTS

Fund: Innovation and Entrepreneurship Training Program for University Students in Heilongjiang Province.

Project Title: A study on the construction of a personalized teaching model of secondary school English classroom based on the cultivation of critical thinking ability under the perspective of big data.

Project Number:S202210231040.

Project level: Provincial General.

Project Type: Innovation Training Project.

REFERENCES

1. Chen Xin-zhong, Zhang Yan-ping. Practice of Consistency of English Teaching Assessment in Secondary School under Big Data[J]. Teaching & Administration, 2021(25):65-68.
2. Jia Zhen-xia. Research on College English Teachers' Effective Teaching Behaviors in Blended Learning[D]. Shanghai International Studies University, 2019.

3. Weiwei Zheng. The Application of Flipped Classroom in College English Teaching in the Era of Big Data[P]. Proceedings of the 2017 2nd International Conference on Education, Sports, Arts and Management Engineering (ICESAME 2017), 2017.
4. Zhu Wei. Exploration on the Application of English Education in Primary and Secondary Schools in the Big Data Era [J]. Education Teaching Forum, 2020(12):89-90.
5. Zhu Zhi. Research on Personalized Teaching Practice of College English in the Background of Big Data[J]. Theory and Practice of Education, 2021(30):59-61.