Scholar Publishing Group
International Journal of Educational Curriculum Management and Research
https://doi.org/10.38007/IJECMR.2025.060105
ISSN 2790-0967 Vol. 6, Issue 1: 40-46

Evaluation Analysis and Teaching Strategy Research Based on Educational Big Data Analysis

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Keywords: Education, Online Learning, Analysis

Abstract: With the advent of the era of big data, the education field has also accumulated a large amount of data, and by making full use of these massive education big data, education will make great progress. Dig into massive amounts of education data to get the information you need. You can understand and grasp the basic situation of students, and predict the development trend of students' learning according to their performance. Big data records the process of higher education development, and the data of each learning stage are recorded, compared with the previous data records of higher education development, planning the next stage of development, and the emergence of big data makes it possible to plan education. Big data will give a certain impetus to every stage of education development, and ultimately promote the development of higher education.

1 Introduction

Most of today's college students are young people born after 2000, and these students are exposed to a large number of electronic devices from birth, such as smartphones, computers, etc., and these people are very fast and easy to use electronic devices. It has long been a habit for them to use electronic devices to edit texts, navigate electronically, search the Internet, and communicate with each other. These young people are already a veritable Internet generation.

College computer science is a general public compulsory course for freshmen in colleges and universities, and this course is a course that combines knowledge, skills and application. It is based on practice, hands-on experience in the process of learning knowledge, and has always consisted of lectures, practical and problem-solving sessions. How to scientifically arrange the class, before and after class, so that teachers and students will not feel tired due to excessive tension, nor will they be too lax and waste their time, so that students can master the necessary knowledge and expand their application ability in the process of sublimation from theory to practice step by step. This requires a rational arrangement of the entire teaching process, which is also the purpose of our research project.

2. Traditional Classroom Teaching Methods

In the traditional course teaching, there is relatively more theoretical knowledge, and the teaching method is mainly lectured. Teachers teach students to listen to lectures, and it is difficult for students to concentrate on the lectures for a long time. This kind of teaching method cannot well mobilize students' interest in learning, and is not conducive to cultivating students' awareness and ability of inquiry. There is too much time for course explanation, and students have less time to practice, and students may understand some of the steps and procedures of the operation during class, but because they do not practice in time, or do not get more opportunities to practice, they quickly forget. Therefore, in the teaching of basic computer science courses in universities, we should not only teach and students listen, but also teach and practice, and stimulate students' interest in learning to the greatest extent through more practical operations.

When learning, most students only follow the steps in the textbook step by step mechanically, and a small number of students set up to memorize the steps of the operation, without taking the initiative to think about new ideas for solving problems, and the method of solving problems is single. Once you encounter practical problems in your study and life, you cannot use the basic knowledge you have learned flexibly. Therefore, in the basic teaching of computer science, we should not only pay attention to the cultivation of students' routine operation skills, but also improve students' ability to analyze and solve problems, truly draw inferences from one another, and strengthen the cultivation of students' innovation ability.

In the traditional teaching mode, teachers occupy the main position in the classroom, and the teacher mainly teaches in the class, and students passively accept knowledge. It is undeniable that teachers play a role in the transfer of knowledge in the teaching process, but this kind of teaching makes students accustomed to passively accepting new knowledge, students lack active thinking, and have no autonomy in learning. This is not conducive to developing students' ability to learn actively.[1]

3 Exploration of Teaching Reform

The teaching design adopts the flipped classroom teaching mode, focusing on knowledge transfer and "learning method" training. Three links were designed: before, during and after class. Pre-class learning is a key part of the whole teaching, which requires students to give full play to their learning initiative and supervise students' learning through testing, Q&A, and communication. Classroom teaching is in the form of group teaching, which completes exploration, display, etc., to achieve teaching objectives and internalize important and difficult points. After-school enrichment is used to help students achieve knowledge transfer.

The traditional classroom teaching mainly includes reviewing the knowledge learned before class, introducing new knowledge points, teaching theoretical knowledge in the classroom, summarizing the important and difficult points by the teacher, and assigning students to complete the corresponding homework exercises after class. In these teaching links, the teacher is the leader, and the students mainly learn and explore according to the teacher's guidance, which cannot give full play to the students' subjective initiative and innovation consciousness. Blended teaching can give full play to the advantages of both teaching methods and promote the improvement of teaching standards.[2]

The teacher team integrates curriculum resources and designs teaching activities, designs students' learning paths, designs the knowledge points of each class and each unit, and organizes teaching materials.

In the teaching process, it is more difficult to make your own lessons from the beginning. Teachers can choose the closest teaching resources or other teaching videos to the course on the

major online learning platforms to prepare students for classroom teaching. According to the knowledge points, it is divided into teaching units, and each teaching video is about 20 minutes. Teachers should also prepare other appropriate teaching resources, such as multimedia courseware, course announcements, class discussion questions, etc.

After the teacher has developed the corresponding teaching resources, they will be released on the platform, and the students will be informed of the key points, difficulties, and corresponding knowledge reserves of the lesson in the form of announcements.The construction of curriculum teaching resources is the premise and foundation for carrying out online and offline blended teaching. There are many ways to prepare teaching resources, which can be combined with the teaching practice of college teachers, according to the accumulation of years of teaching, etc., to decompose and compile the course knowledge points, make teaching videos, other teaching materials and other digital materials and publish them on the network platform, and build the teacher's own online course learning resource library. [3]

The organization phase of the teaching process is very important in the whole teaching process. Students watch instructional videos based on announcements made by the teacher before each lesson. Students who have a good grasp can not watch the learning video materials repeatedly; For key and difficult knowledge, students can watch learning videos repeatedly. Students have transitioned from traditional passive learners to active learners. From the original unified and fixed time classroom teaching, to the learners according to their own situation to choose the learning content, progress, difficulty, etc., without time and space limitations.

Establish a resource library of teaching activities, unify and improve the syllabus, standardize the course content, continuously establish rich curriculum resources, and create personalized classroom teaching. [4] In each classroom lesson, the teacher will assign tasks for the next lesson, such as reading the textbook, watching teaching videos online, some exercises before class, and so on. To ensure that students have clear learning goals.

It has innovated the teaching model and redefined the role of teachers. The teaching model allows teachers to become the guides, controllers, and promoters of the entire teaching process, and provide personalized guidance to students in a more targeted manner to solve the problems encountered by students in the learning process. Provide students with a more complete learning experience, improve students' enthusiasm for learning, greatly improve the completion rate of the course, and improve the efficiency of teaching.Through blended teaching, before formal classroom teaching, learning tasks are assigned to allow students to learn more independently online and offline before class, cultivate students' independent and innovative learning thinking ability, and students can also have more time to think and communicate between students and teachers.

In classroom teaching, teachers expand and extend knowledge points according to students' interest topics and academic confusion feedback before class, so as to enhance the attractiveness of classroom teaching and improve students' head-up rate. Make full use of the learning app to initiate various activities, such as answering questions and selecting people, etc., to activate the classroom atmosphere, mobilize students' enthusiasm for learning, and guide students to better play the main role. Use the feature of thematic discussion to showcase student learning outcomes. Polls and questionnaires can be used to initiate discussions, interact with teachers, and interact with students. Use quizzes to test students' academic completion to help students consolidate and improve their participation. [5]

In the process of teaching, students and teachers, students and other students can increase the mutual communication between students and teachers, students and other students, teachers release and discuss and other different activities, can be students before class all knowledge points to answer questions, share, help students deepen the in-depth understanding of the pre-class knowledge points, and at the same time, through the pre-class knowledge points can be extended to

the knowledge points taught in this class and other related professional disciplines. [6] After-class learning is mainly for students to review and consolidate what they have learned, students discuss the topics in the class in the online teaching platform, and students check their knowledge mastery and share the gains in the learning process. The teacher summarizes the questions raised by the students in class and sorts out the knowledge system of the course. Teachers can also make adjustments to the pre-class and in-class teaching stages based on students' performance in class and suggestions and opinions in the learning process to make them more suitable for students' learning.

The new teaching model has achieved four changes, namely: from focusing on "teaching" to focusing on "learning"; from "focusing on the transfer of knowledge" to "focusing on the development of students"; from how to "teach textbooks" to how to "use textbooks"; Shift from "traditional teaching" to "new concept teaching".

After the physical classroom teaching, the teacher summarizes, and the students independently sort out and analyze the key points and difficulties of the class, and actively reflect on it, and the teacher also continuously reflects on the teaching according to the degree of acceptance by the students, and explores and improves the teaching mode. Changing the traditional teaching mode, students are no longer passive learners and accept knowledge, teachers are no longer the leaders of the classroom, and students become the leaders. Students are more active in participating in the classroom, their enthusiasm for learning is greatly improved, they can take the initiative to think, ask questions and take the initiative to solve problems, which fully cultivates students' independent innovation ability and practical ability to solve problems.

4 Assessment and Analysis of Online Learning Performance

The evaluation and analysis of online learning performance is a crucial part of the field of online education, which not only helps teachers understand the learning of students, but also provides a strong basis for teaching improvement. The following is a detailed discussion of online learning performance assessment and analysis. Through online tests and online questionnaires, objective and subjective tests can be conducted through online platforms, and students' learning can be quickly collected. The online questionnaire is used to understand students' learning experience and learning attitudes, providing multi-dimensional information for assessment.

To evaluate students' online learning behavior by using data mining technology, it is necessary to first collect and sort out students' data on the platform, and then apply data mining methods to interpret and evaluate the analysis results after a series of operations such as prepossessing and cleaning. The classification algorithm is used to classify learners and make personalized recommendations based on their learning data. Clustering is mainly used to analyze learners' learning behaviors and learning characteristics, and can also be used to detect learners' behaviors. [7] .

4.1 Project-based Learning Assessment

Students are encouraged to work through individual or small group collaborative projects with process assessments. Assessments include writing reports, videos, presentations, etc., and assessing students' analytical, problem-solving, and teamwork skills. Students are encouraged to record their thoughts, questions, and perceptions during the learning process, and to engage in self-reflection. Assess students' self-learning ability and critical thinking. Students exchange work with each other and evaluate each other's learning outcomes. Develop students' critical thinking and self-reflection skills.

4.2 Analytical Indicators for the Assessment of Learning Performance

Examine students' learning outcomes and assess students' mastery of curriculum knowledge through tests, exams, assignments, etc. Pay attention to whether students can correctly answer relevant knowledge questions and whether they can use what they have learned to solve practical problems.

Statistics on students' learning participation, record students' online learning time, number of interactions, time to submit assignments and other data. Reflect students' level of engagement and attitude towards learning.

Analyze students' learning paths and learning trajectories, and evaluate students' learning efficiency and learning strategies. Identify possible learning disabilities or bottlenecks for students. Students are encouraged to integrate and apply knowledge from different disciplines to solve complex problems. Assess students' ability to integrate learning and think interdiscursively.

5 Challenges in Online Learning Assessments

5.1 Technical Challenges

The stability and compatibility of the platform faces certain technical challenges, and the online learning platform needs to ensure stable operation in various devices and network environments to avoid technical failures affecting the learning and assessment process of students. Data security and privacy protection: Online learning involves the collection, storage, and processing of large amounts of student data, and how to ensure the security and privacy protection of this data is an important challenge. Technology Updates and Adaptability: As technology continues to evolve, online learning platforms need to be constantly updated to adapt to new teaching needs and technology trends, which requires a high degree of flexibility and scalability.

5.2 Student Challenge

Challenges in terms of self-discipline and motivation to learn, online learning requires students to have high self-discipline and self-management skills, but some students may lack these skills, resulting in poor learning results. In terms of technical proficiency, students need to master certain computer and network skills in order to successfully study online, but some students may have difficulties in this regard. Student engagement in an online learning environment can be affected by a variety of factors, such as lack of face-to-face communication, lack of attractiveness of learning resources, etc.

5.3 Teacher Challenge

Teachers need to master online teaching skills, including curriculum design, teaching resource production, online interaction, etc., as well as adapt to new teaching methods and assessment methods. In terms of workload and pressure, online teaching requires teachers to devote more time and energy to lesson preparation, student management, and assessment, which increases the workload of teachers.

Technical support needs: Teachers need to receive adequate technical support so that they can solve technical problems in a timely manner to ensure the smooth progress of teaching.

5.4 Curriculum Design Challenges

Content quality and engaging: Online courses need to be designed to be fun and challenging to capture students' attention and keep them interested in learning. Interactivity and engagement: Online courses need to be designed with rich interactive sessions to increase student engagement and learning. Diversity of assessment methods: Online learning assessment requires the design of a variety of assessment methods to comprehensively and accurately reflect students' learning outcomes.

5.5 Methodological Challenges in the Assessment

Limitations of quantitative assessment: Traditional quantitative assessment methods, such as test scores, may not fully reflect students' learning outcomes and learning processes. Complexity of qualitative assessment: Although qualitative assessment methods can provide richer information, they are complex and time-consuming to implement. Accuracy of assessment results: E-learning assessments need to ensure the accuracy and reliability of assessment results and avoid being affected by various distractions.

In summary, online learning assessments face multiple challenges. In order to overcome these challenges, a concerted effort is needed, including strengthening technical support, improving student self-discipline, improving teachers' teaching skills, and optimizing curriculum design and assessment methods. At the same time, it is also necessary to continue to explore and innovate to adapt to the new trends and needs of online learning development.

Acknowledgement

Research Project of Jilin Provincial Department of Education, "Research and Construction of Educational Big Data Analysis and Decision-making Platform Based on Data Mining", Project No.: JJKH20251708KJ.2023 Jilin Province Higher Education Research Project "Research on the Impact of Artificial Intelligence Technology on Higher Education Teaching Evaluation", project number: JGJX2023D775.National Higher Education Computer Basic Research Committee Project "Construction of Computer Curriculum System for Artificial Intelligence and Big Data Application Needs" Project No.: 2024-AFCEC-672.The Science and Technology Project of Jilin Provincial Department of Education "Research and Construction of Educational Big Data Analysis and Decision-making Platform ".Changchun University of Humanities Welfare Special Fund Project "Welfare Curriculum Reform Based on AI Technology", Project No.: FZKY2024042.

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