

Learning Effect Evaluation of Online Courses Based on Learning Analysis

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Abstract: Modern information technology has been widely used in modern teaching, and modern teaching has gradually shown diversification. Based on the research of online learning behavior, the strategic design of online learning behavior analysis for promoting online course learning was put forward in this study, and 30 learners were selected to carry out specific learning experiments for verifying the effect of learning analysis on curriculum learning. According to the evaluation results of learning effect, it can be seen that online learning analysis can achieve good learning results, which is helpful for students to improve their learning effect and teachers to improve teaching effect, and can be better applied to the teaching practice of online course.

1. Introduction

With the rapid development of educational informationization and the maturity of various educational service platforms, it is of great significance to provide reference information for educational and teaching decision-making for educators at all levels based on the statistical analysis of learners' online learning data and to support learners' efficient autonomous learning [1]. By using the learner's learning data stored in various network learning systems or learning platforms, the learner's learning progress and content can be timely understood through learning analysis techniques and statistical analysis methods, and individualized guidance and help for students' autonomous learning can be provided to achieve better learning effect. The relevant learning data in the process of students' learning can be recorded by means of online teaching, and corresponding teaching strategies supporting teachers to implement online classroom and feedback strategies for students' autonomous learning can be designed according to the study of the relationship between learning behavior and achievement [2]. On the one hand, these strategies can provide reference strategies for other primary and secondary school teachers to carry out the online classroom teaching based on information technology smoothly, teachers can objectively understand students' learning situation from the analysis results presented, find out the shortcomings of students in various learning links, give timely intervention and guidance to students by referring to the analysis conclusions and feedback strategies, guide students in classroom teaching according to their reaction state in the process of learning and adjust teaching progress and arrange teaching activities in time [3]; on the other hand, teachers can provide students with individualized self-learning experience reference strategies, so that students can use the results of the analysis to self-evaluate their learning situation, and recognize their strengths and weaknesses according to the feedback given by teachers, adjust their learning methods, and make up for the lack of knowledge in time.

2. Online Learning Behavior

2.1. Concept of online learning behavior

Behavior is generally divided into two kinds: explicit behavior and internal behavior. Explicit behavior refers to explicit behavior that can be observed directly by other people, such as behavior when talking to others, while internal behavior refers to recessive behavior that is not directly observed by others, such as the state of one's own thinking, consciousness or mental activity [4]. Generally speaking, learning behavior refers the behavior of all learning activities conducted by learners for a certain purpose or under the guidance of a certain learning motivation to achieve a certain learning achievement or result. According to the definition of human behavior based on

behavioral theory, learning behavior can be regarded as a series of interactive activities between learners and their surroundings to achieve certain learning achievements or results under the guidance of certain encouragement or incentives [5]. Online learning is a new learning mode in the information environment, which is very different from traditional teaching methods, it does not restrict the place and time of learning. As long as learners make use of rich and freely shared network learning resources or download and cache learning resources in advance, they can learn independently at any time and anywhere according to their own needs.

Concerning the concept of online learning behavior, there is no uniform definition of this concept at home and abroad, and similar concepts to online learning behavior are as follows: "Network Learning Behavior", "Digital Learning Behavior", "Distance Learning Behavior" and so on. The network learning behavior refers to the learning-related behavior of learners in the e-learning environment in the whole autonomous learning process. The "digital learning behavior" refers to the related learning behavior that learners take advantage of the digital learning resources in the network platform to carry out independent learning activities [6]. Distance education is a new educational system, which mainly focuses on learners' autonomous learning, learners use multimedia or network platforms for autonomous learning with the help of teachers' distance guidance, so distance learning behavior is a learning-related behavior in the process of autonomous learning. The consistent feature of these learning behaviors is that learners' learning-related behaviors occur in the process of autonomous learning, which are relatively more autonomous than those expressed in traditional teaching. Online learning emphasizes the use of open and shared learning materials or resources in the network environment as well as teaching resources of corresponding courses, learners carry out autonomous learning around certain learning objectives according to their own learning plan, learning progress, learning time and so on.

2.2. Classification of online learning behavior

The analysis of online learning behavior types is different because of the different research directions and classification indicators of various scholars, so the classification of online learning behavior is different, but the ultimate goal is to use learners' online learning behavior to evaluate their learning situation reasonably. Online learning behavior includes the following five categories:

The first is information retrieval, this kind of online learning behavior is usually retrieved by learners with the help of search engines such as Sogou and Baidu, which are based on question keywords or a brief summary of the information they need, thus obtaining the correct path of the information they need, if learners do not know enough about the information they want to retrieve, they need to browse relevant web pages to search for the learning materials they need; the second is information processing, such online learning behavior is that learners should screen the network information, save, classify, download and collect the information they need [7]; the third is task-driven learning, this kind of online learning behavior refers to the learner's learning behavior for fulfilling the corresponding learning task requirements or achieving a certain learning purpose, including submitting homework, participating in online testing, publishing the results of works and so on, if the purpose is to encourage students to learn the scoring process of their learning behavior, such behavior also includes related learning resources sharing, clicking and so on; the fourth is information publishing, this kind of online learning behavior refers to learners' publishing information behavior through learning platform forums or tools, including writing learning notes, filling in personal information, posting, uploading learning materials and so on; the fifth is interactive category, this kind of online learning behavior refers to the behavior that learners use the network learning environment to communicate, discuss and interact with people, including exploratory learning by using chat tools or by communicating with other people through sending letters, chat rooms and so on, and learners can freely express their views, this kind of behavior can also be an interactive learning activity with teachers [8].

3. Strategic Design of Online Learning Behavior Analysis for Promoting Online Course Learning

3.1. Adaptive strategy design for learning tasks

In online teaching, there is usually a process of self-study by issuing task sheets before class, one way is for students to study at home, the other is the form of in-class reversal, that is, the task of self-study before class is carried out in one class hour, or the task of self-study before class and in-class chemical learning are combined into one class hour according to the amount of learning content. However, whether in-class or out-of-school autonomous learning, students need to watch teaching videos or use learning resources in designated learning platforms to learn [9]. From the results of the analysis above, it can be seen that there is a significant correlation between the achievements in guidance programs and the test scores, the less time the students spend in completing the guidance programs, the higher their grades will be. The students who spend relatively more time are mainly due to the difficulties encountered in the process of learning, which leads to the longer time spent.

3.2. Adaptive strategy design for learning resources

Resource access, download speed and test scores are highly correlated, namely, students make effective use of the practical operation video, micro-videos of relevant knowledge points, text-assisted materials provided by teachers and other learning resources or the related network learning resources found by students themselves, and the corresponding students' modular test scores are high, otherwise their scores are low.

3.3. Adaptive help strategy design for discussion area

Students' posting, replying and being replied in the discussion area are all related to their test scores, that is to say, students do not avoid and hide their learning difficulties in the process of autonomous learning, but try to solve them actively or seek help from other students and teachers to solve puzzles and questions in time, meanwhile, learners are more active in communicating with teachers and classmates in the process of learning, which deepens the understanding and mastery of learning content, thus the corresponding students' modular test scores are high, otherwise the scores are low [10].

3.4. Adaptive help strategy design for tests

At the end of each chapter, each test question in the test paper is related to the concept of knowledge points when the learning effect of the module is tested. The learning system sets conceptual links and required and selected topics with different difficulty, teachers review knowledge points with low scoring rate and set up intensive tests, and students carry out self-evaluation and adjust learning methods.

4. Evaluation of Learning Effectiveness

In order to evaluate the learning effect, learners evaluated themselves according to their learning enthusiasm and active participation in the process of autonomous learning and in-class learning, as well as systematic feedback, summarized their shortcomings in the process of learning by combining with the learning feedback given by teachers, and made timely adjustments. In this study, 30 learners self-evaluated the online learning situation of the same course. The contents of the evaluation are listed in Table 1.

As can be seen from Table 1, the learning effect of online courses based on learning analysis is good, most people can actively participate in the classroom, and they are more confident and good at cooperation and thinking through learning.

Table 1 Evaluation results of learning effectiveness of online courses

| Contents of self-evaluation | Purpose of evaluation | Excellent | Good | Medium | Bad |
|---|---|-----------|------|--------|-----|
| Initiative questioning in class learning | Can you take the initiative to participate? | 21 | 7 | 2 | 0 |
| Correcting erroneous opinions expressed by other students | Do you dare to question? | 22 | 6 | 1 | 1 |
| Seeking help from others when facing difficulties | Are you modest enough to ask for advice? | 25 | 5 | 0 | 0 |
| Actively helping other students solve doubts | Are you willing to help each other? | 20 | 6 | 3 | 1 |
| Actively solve problems with team members | Are you good at cooperation? | 18 | 10 | 2 | 0 |
| Expressing thoughtful ideas in a structured way | Are you good at thinking? | 20 | 4 | 4 | 2 |
| Often praised by teachers and classmates | Do you have self-confidence in learning? | 24 | 3 | 3 | 0 |

5. Conclusion

Based on the network learning platform, the statistical analysis on the data of students' learning behavior in online learning process was made, teaching and learning feedback strategies were designed, reference and help were provided for teachers to carry out teaching in a targeted and efficient manner, and corresponding suggestions and interventions were given for each student's learning problems in each learning link. Specific strategy design includes adaptive strategy design for learning tasks, adaptive strategy design for learning resources, adaptive help strategy design for discussion area, and adaptive help strategy design for testing. Through the evaluation results of online course learning effect of 30 learners, it can be seen that most of learners have achieved good learning results, and learning analysis can help students to get better learning results. However, due to the relatively small number of students participating in the experiment, more experimental data can be used to get more sufficient research conclusions.

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