

Current Status and Progress of Research on Online Learning Behavior Analysis

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Abstract

With the development of information technology and the continuous application of big data processing technology in the education field, more and more online learning platforms are being used in actual teaching. The new crown epidemic that broke out in early 2020 has promoted the popularization of online learning methods. In order to gain insights into the main progress and current situation of online learning behavior analysis research, based on the relevant papers published in the core journals of China CNKI from 2014 to 2021, the research hotspots and development trends of online learning behavior analysis in my country are sorted out. On this basis, further summaries and suggestions are given to provide reference for follow-up related research.

Keywords

Online learning behavior analysis; Research hotspots; Development trends.

1. Introduction

With the continuous development of information technology, various types of online learning platforms at home and abroad have been put into use one after another. Online learning has become a new channel and new way of contemporary learning. Therefore, learning behavior analysis is also widely used in education. Traditional education data is singular and one-sided, and cannot objectively present all learning behaviors of learners. The online teaching platform comprehensively records the learning behaviors of learners, such as the result data of learning, learning methods, and platform usage characteristics [1]. Through the use of different analysis methods and techniques to analyze the behavioral data in the learning process, so as to understand the learner's internal characteristics and learning habits, later measures can be used to further interfere with the student's learning situation.

2. Status Quo of Research on Learning Behavior Analysis

The author searched CNKI with "topic" search terms and "online learning behavior analysis" as the search terms, and retrieved a total of 142 related documents. Beginning in 2014, the number of research related to the analysis of online learning behavior by domestic researchers has continued to increase, and the research interest has continued to grow. In 2019, 39 journals on online learning behavior analysis were published on CNKI, which has become a hot topic in my country's current academic circles.

Learning behavior analysis is to collect behavioral data related to learners' learning and analyze the learning behaviors of learners based on related data, and feed back the results of the analysis to learners, teachers and other roles [2]. This allows for a better understanding of the process of learning so that appropriate interventions can be made. Generally speaking, domestic scholars' research on online learning behavior analysis focuses on the following aspects.

2.1. Online Learning Behavior Analysis Model

The online learning behavior analysis model is to provide a tool for analyzing learners' online learning behavior characteristics, and the analysis results are conducive to providing learners with personalized learning support more comprehensively and systematically. H.Qiao et al. systematically analyzed learners' open learning behavior based on the perspective of behavioral cognition. Based on the idea of combining theory and practice, they used xAPI modeling to analyze the behavior characteristics of open learners [3]. L.J. Wu comprehensively analyzes the collected learning data and related information through three methods of correlation analysis, classification analysis and cluster analysis, and builds an online learning behavior analysis model based on data mining technology [4]. Y.H Wu combined the xAPI data specification, Bloom's cognitive behavior classification and STEAM 4C capabilities to propose the use of xAPI specification and STEAM 3D education learner behavior analysis model [5]. Y.L. Hu analyzed the online learning behavior model from three aspects: data mining and domain application, learning behavior analysis model, and network behavior analysis model, and modeled the data, mechanism, and results from the bottom up [6]. Q.Jiang, W.Zhao and others built an adaptive online learning analysis model for personalized adaptive learning forms, and combined the research direction to design four dimensions, including: data and environment, stakeholders, goals, and methods [7].

2.2. Study Path Research

Learning Path is the route and sequence used to carry out learning activities. According to the learner's goal, learning content, learning environment and learning foundation and other elements, rationally order each link of the learning activity. This is the arrangement of the "learning path" [8]. D.N.Hu used the lag sequence analysis method to explore the behavior logic revealed by the sequence of the two learning behaviors of watching videos and completing homework, and generated a learning path diagram [9]. Q.Jiang et al., based on the AprioriAll algorithm, integrates the behavior trajectories of learning groups with similar knowledge levels and close learning preferences, and draws learning paths according to learner characteristics, learning difficulty levels, learning media types and other factors to support personalized learning [10]. Starting from the learning behavior of online learners, L.L.Cao studied and analyzed the learning behavior characteristics of learners in the online learning context, such as the selection of teaching content, reading and the meaning construction of knowledge, and found that effective learners use teaching resources in the process of online learning. The choices can be aggregated into a more stable learning path [11].

2.3. Study on the Relationship between Learning Behavior and Performance

Y.Zong formulated 18 indicators to evaluate the learning behavior of MOOCs based on the logic analysis strategy. The research results believe that online learning behavior is significantly related to academic performance [12]. C.K.He et al. through logistic regression analysis of 16 courses on the edx platform and the learning behavior records produced by 600,000 learners, they found that the learning effect can be more accurately predicted based on the learning records [13]. Researchers such as J.Y.Jia pointed out that learners' academic performance is significantly positively correlated with online learning behaviors such as online time, number of videos watched, number of web pages viewed, number of times to browse and download handouts, and degree of participation in forums (posting, replying) [14]. Z.J.Mou et al. found that learning results can be evaluated by observing the number of learning or comprehensive learning time and frequency [15]. M.L. Li pointed out that learning motivation is an important influencing factor of course completion, which can stimulate learners' interest from knowledge, skills, and learning methods [16].

3. Summary and Suggestions

Based on the conclusions of the previous five years of research and analysis of online learning behavior, some thoughts and suggestions are put forward on how to carry out research in the field of online learning behavior analysis in the future.

3.1 Interdisciplinary Team Formation, Integrating Multidisciplinary Theories and Achievements

The research field of online learning behavior analysis involves multiple disciplines and fields such as educational technology, computer science, and psychology. The research team with diversified interdisciplinary components is conducive to learn from and integrate the research results of existing disciplines, and provide a deeper analysis of online learning.

3.1. Appropriate Attention to Online Learning Behavior Research of Learners in the Field of Basic Education

Nowadays, the informatization of colleges and universities is developing rapidly. At the same time, learners in the field of higher education are more capable of autonomous learning. College students have more opportunities to learn online than students in the basic education stage, resulting in more online learning behaviors. Data for analysis. However, in recent years, with the trial implementation of the blended learning model in the basic education stage, young learners will gradually become the main participants in online learning. Research on the online learning behavior of basic education learners can provide data for personalized learning and teaching design research.

3.2. Multi-Modal and Multi-level Analysis of Learner Behavior Characteristic Data

With the maturity and development of learning analysis technology, the sources and types of information about learners become more diversified. It can analyze learners' learning behavior, learning psychology and other aspects of data, as well as learners' physiological information. In order to interpret learners' online behavior characteristics, needs and development trends more accurately and truthfully, it is necessary to analyze learner behavior characteristics data from a multi-modal and multi-level perspective.

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