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Analysis and Research on Teachers' Network Teaching Behavior Based on Data Mining

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Abstract

Nowadays, network teaching plays an important role in educational guidance and lifelong learning in the overall promotion of network communication technology, based on the analysis of the requirements of modern education concepts. Therefore, on the basis of understanding the basic concepts of the current teachers' online teaching behavior, this paper analyzes how to use data to explore and research teachers' online teaching behavior according to the content of teachers' online teaching behavior, so as to provide an effective basis for the future development of online study.

Keywords

Data Mining; Teacher; Online Teaching; Teaching behavior; Coding; Behavior Prediction.

1. Introduction

Teachers are important people in the implementation of the practical educational work and the cultivation of talents. Their professional skills and comprehensive qualities directly determine the growth of generations of people. In the era of rapid development of information technology, teachers should not only pay attention to classroom and campus teaching, but also study the practical significance of the replacement of the traditional training by the online learning based on the current online education situation. Today, although China has increased its investment in online teaching, from the perspective of overall development, its work has not achieved the expected effect in the development of practice.

2. Internal Analysis of Teachers' Online Teaching Behavior

In essence, teachers' online teaching shall be considered from the point of balanced development. Through combining the network platforms with the subject teaching needs and the analysis of the practical classroom teaching results made by education and training institutions around China, it can be seen that in order to improve the efficiency of practical teaching, optimize the professional level of teachers, and deliver more professional theories and skills, teachers' online teaching must be based on the network and follow the practical orientation while developing in a balanced way. Nowadays, there are no clear requirements for this content both at home and abroad, and the explanation of teachers' online teaching behavior is that learners should use online medias to independently develop learning interest and clarify learning motivations, so as to master more knowledge under the remote guidance from teachers. According to the analysis of the implementation situation of the online teaching in recent years, the online teaching behavior of teachers refers to browsing Internet resources, retrieving Internet information, and processing and managing knowledge data, etc. It is characterized by subjectivity, openness and directivity and so on in practical work [1].

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3. Analysis of the Content of Teachers' Online Teaching Behavior

3.1. learning Process

In the teachers' network teaching, in which the learning process is a critical component, it is necessary to process the behavior data generated in that process under the model to obtain patterns of the models , so as to provide better services for the future systematic research. Taking learning methods as an example, studying the teacher's online teaching models shows that the available learning methods include independent learning, reflective learning, and collaborative learning, etc. Thinking about the teaching behavior of teachers from the perspective of learning, learning methods contain the independent learning and the mutual discussion and many other respects. Among them, independent learning is the most common way of online teaching guidance and mainly involves two aspects in the implementation, which are resource learning and the management of personal knowledge. In this process, teachers and students' self-control ability and autonomous exploration consciousness can be intuitively presented. The independent learning is also the most commonly used and easiest teaching method for teachers in practical teaching. In the autonomous learning, teachers and students need to have personal space and get access to the required teaching resources. At the same time, before and after teaching guidance, they must scientifically use the network platforms to consult and retrieve various information according to their own technical experience [2].

3.2. Design Model

On the basis of mastering the teachers' network teaching system, in order to study the characteristics and methods of the that behavior, it is necessary to construct a relevant research model, as shown in Figure 1 below. The research model designed in this paper mainly analyzed the influence of the four factors of participating learners, learning application resources, tools and groups on behavior. Before practical research, the data model contained in it was considered as the behavior and activities performed by the participating behavior subjects and as the impacts on the behavioral objects. At this time, the object refers to the operation object after the teachers' teaching behavior take place, and the data information related to it will be stored in the database, which involves the types, names, and identifications of the targets. It should be noted that when studying and analyzing teachers' online teaching behavior, both the structural model and the data model are established based on the techniques of data mining and analysis [3].

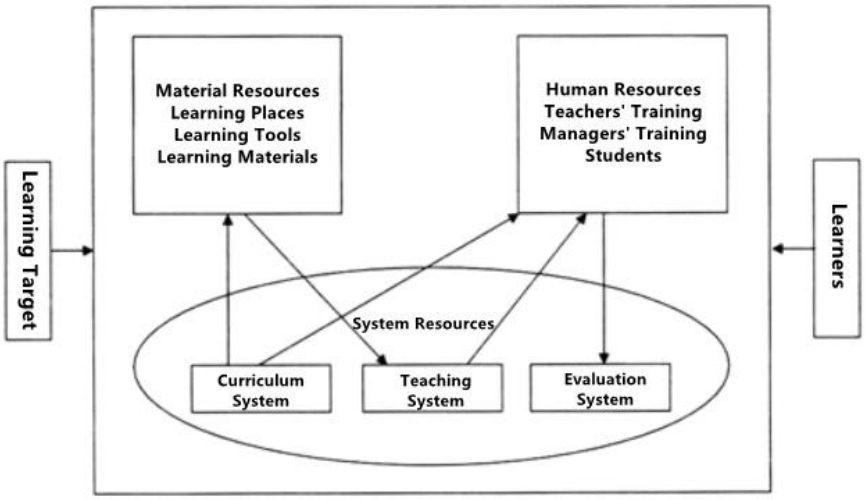

Figure 1 Research Model Diagram

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4. Case Analysis of Teachers' online teaching behavior based on Data Mining

4.1. Process

The case outlined in this paper is a teacher's network synchronization training project. The core of this content is to obtain practical orientation in the balanced development based on the network. Combined with the practical case analysis, it can be seen that this training activity can not only improve the professional level of teachers, but also meet the needs of practical classroom teaching. It uses data mining technology to collect and research related data, and then deals with the problems encountered during learning, and combine behavior theories and data technology to study the learning behavior of teachers and students. The specific data mining process is as follow: first, collection. The selected data mainly comes from the database of the learning platform and the web log information of the server; second, processing. It is necessary to clean up the collected information, which involves functions such as loading, extracting, and conversion and make the learning records and store them in the learning recording warehouse in the end; third, after finishing the data collection and processing, use the analysis model and mining software to continue to explore the data information inside the warehouse, and establish a meaningful data information chart; fourth, the data chart can visually present the evaluation and analysis content of the teacher's online teaching behavior; fifth, send the analysis and evaluation results to the teachers' network teaching behavior learners, and implement scientific evaluations on their learning behavior [4].

4.2. Mining and Analysis

In the research of this paper, the data mining of teachers' online teaching behavior involves both analysis and prediction. Combined with the analysis of practical cases, it can be known that the use of data mining technology to obtain behavioral evaluation results can guide teachers to provide more guidance and suggestions for online teaching behavior and provide data basis for their practical teaching guidance and management.

First, teaching behavior. Time recognition is an important basis for studying teaching behavior, and it is also a basic content for optimizing platform's functions and implementing operation, maintenance and management. When studying time identification, this paper adopted DAY as the statistical standard, hoping to acquire the platform's application information at different times of the day, so as to study the characteristics of the teachers' teaching behavior and learning time, which is crucial for training service departments.[5].

Second, the discovery of the teaching model. This content is also the basis for the study of teaching behavior, and it is necessary to explore the patterns contained in it on the basis of mastering the users' learning characteristics and learning patterns. In this process, the learning patterns of different teachers are variant. According to the analysis of practical cases, this work steps mainly include the following points: First, the learning behavior should be coded, and the action information in each information data should be judged and identified according to the unified regulations, which are shown in the following table; secondly, it is necessary to employ the coding information table and the teaching mode to discover the model, and then statistically analyze the data access records; in the end, obtain the overall network behavior statistics table according to the analysis results [6].

Table 1 Coding Table of Online Learning Behavior

Learning Behavior	Action	Code
Login/logout	Login	GL1
	Logout	GL2
	Guest	GL3

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Password changing	Change passworld	GL4
register	Submit	GL5
Learning Records	Report partieipation Report log Report outline	FS6 FS7 FS8

In the case outlined in this paper, studying the online teaching behavior of teachers helps to lay the foundation for mastering the operation of the learning platform and proposing effective learning methods. Therefore, it is necessary to pay more attention to this work in practice.

Third, behavior prediction. By studying the learning behavior of learners and analyzing the time series, the probability of learning behavior can be predicted. This paper takes mathematics of the first grade as an example to analyze the learning sequence of teachers and predict their learning behavior. On one hand, it is necessary to code the access records of the learners participating in the course. For example, userid represents the ID code of the learner, sessionid represents the code of the effective sequence, and module represents the type of the application function model, etc. Using the Sequence algorithm to perform correlation analysis on the sequence can infer the probability of subsequent occurrence based on the studies before and after the learning process; on the other hand, in the data mining period, because of the difference in design parameters, the final results obtained are also different. In the study of this paper, the minimum supporting rate of rules is set at 30%, and the minimum confidence rate of rules is 50%. In this process, researchers can combine data and information to study the teachers and students' behavior patterns, age, education level, professional titles and other aspects, which are all effective basis for the optimization of the subsequent education and teaching work.

5. Conclusion

In summary, the studies of teachers' online teaching behavior as the basic content of the promotion of teachers' online learning work are also an effective guarantee for the development of practical teaching and the rational use of network resources. Therefore, in the development of practice, data mining technology should be used scientifically to construct a research model for teachers' online teaching, and the analysis of teachers' teaching and learning behavior should be considered as the emphasis. So the level and efficiency of practical teaching can be improved while the effective feedback is obtained.

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