Application Structure Computer Big Data Technology in Internet Learning

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Abstract. The establishment of online learning platform through the Internet is a more popular way of learning. However, the existing Internet learning platform is still not intelligent enough, especially in data integration and analysis. Therefore, this paper proposes the application and research of computer BD(Big Data) based on structure in Internet learning. In this paper, the structure of computer BD and Internet learning methods for in-depth research and analysis, the existing problems in the Internet learning, combined with structural computer BDAT(Big Data Analysis Technology), established a new Internet learning BD analysis method. In view of the complex source of Internet learning data and large amount of invalid information, this paper optimizes and improves the traditional BD analysis data preprocessing method according to the characteristics of Internet students' learning. Through the optimization and improvement of the method in this paper, the data analysis ability of the system is improved. In order to further verify the practical application effect of structural computer BD in Internet learning, this paper takes the freshmen of computer major of grade 2018 in a university as the research object of this experiment and carries out relevant investigation and research. According to the survey, 90.3% of students think that BD analysis can improve their mastery of knowledge in online learning. The analysis shows that the structure-based computer BD plays a good auxiliary role in students' Internet learning.

Keywords: Big Data Analysis Technology, Internet Learning, Network Teaching, Data Mining

1. Introduction
With the continuous development of society and the continuous progress of science and technology, we have entered an era of rapid development of information technology and science and technology. With the continuous popularization and improvement of the Internet, a variety of information knowledge is more concentrated and richer, which makes people's learning more convenient [1-3]. The Internet has produced a lot of information while strengthening communication. The explosive development of these information promotes the development of BD technology, and the continuous improvement of BD technology also has an impact on Internet learning. Applying BD technology to Internet learning can help learners acquire knowledge faster and more conveniently, and also enrich the application mode of BD [4-5].
In the field of education, the Internet application is mainly focused on online education. Through the online intelligent learning system, students' online learning resources can be viewed at any time [6-8]. Not only that, the Internet also has a strong memory ability, according to the habits of students, students can easily get the knowledge they want. Through the application of the network in the field of education, students can learn knowledge more easily and have a longer memory time, which plays a very important and significant role in modern education [9-10].

At present, the common problem of the Internet is that students can't learn effectively. So that students in the network learning, the lack of data analysis in the case of blind learning, resulting in the learning effect is not ideal. Therefore, this paper proposes the application and research of computer BD based on structure in Internet learning, hoping to further improve the data analysis ability of network teaching platform by integrating BD technology. According to the characteristics of Internet learning, this paper optimizes and improves the data processing method of traditional BDAT, and the improved algorithm will be more suitable for the application in the field of Internet learning. This paper studies the application mode and application process of BDAT in Internet learning, analyzes the shortcomings of existing BDAT in Internet learning application, and puts forward improvement measures. The analysis shows that the research in this paper has achieved ideal results and made a contribution to the application research of structure-based computer BD in Internet learning.

2. BDAT and Internet Learning

2.1 Connotation of BD

With the application of computer, BD has gradually occupied people's world. BD is defined as a new information processing mode which adapts to massive and diversified information assets and has strong decision-making ability. The actual development of BD mainly includes three technologies. (1) Distributed computing framework: This is a model that can simplify programming in the meta computing environment; (2) distributed file system: This is an important way to store data with the help of cloud computing BD processing system, which has strong operability and reliability; (3) real time stream processing technology: a technology focusing on data form and real-time, which can handle real-time data stream architecture at any time.

2.2 Application of Computer BD in Internet Learning

After years of continuous improvement of computer BD, there are more and more new technologies. In the process of applying some new technologies such as data mining, we can more accurately find the appropriate learning resources from the numerous learning resources, and excavate some potential valuable learning resources to meet the different learning needs of students. In addition, the application of computer BD in Internet learning is also reflected in data processing and calculation. In the process of teaching students with traditional methods, teachers need to face a large number of students. Therefore, if teachers want to understand students, they can only understand students from the perspective of academic performance, but cannot make a more comprehensive evaluation of students. With the help of BD technology, teachers can use BD to have a deeper understanding of students and make corresponding learning plans according to different students.

2.3 Online Interaction

Online interactive teaching is a teaching mode based on Internet, BD and online learning platform. The main use of BD technology, the introduction of various online interactive software into teaching, so that learners can actively participate in chat and other learning discussions. Compared with the traditional classroom discussion, this online interactive way is more convenient for communication, more people will participate, the information generated by interaction will be greatly increased, and a large number of new ideas and ideas will appear, which is very beneficial to students' enlightening learning. At the same time, this kind of online interaction can also be grouped like a real class, making the forms of interaction more diversified. In addition, students can find learning partners with their own ideas or
temperament in the interaction, so that they can have more in-depth interaction, mutual encouragement, mutual progress and common progress.

Another way to interact online is between teachers and students. Teachers can send all kinds of learning resources and problems to the Internet through the network platform. Students can get them in time and choose their study time at will. Learning questions can also be sent to the network at any time. This interaction mode has less time limit and more convenient interaction.

2.4 Search Engine Mode
Students will inevitably encounter some knowledge related problems in life, and the current search engine function provides great convenience for students, students can find the answers they need at any time. The Internet provides a lot of learning information, which makes the Internet learning mode of computer BD widely used. Students can quickly access learning resources and timely query the problems encountered in learning. Moreover, the search method is extremely convenient and fast, only need to input the key words of the question to query the relevant information and knowledge. In addition, many teaching platforms also have special search and query systems, which can be installed on mobile phones, tablet computers and personal computers. Teachers can put the information on the big screen when teaching, so that students can learn more knowledge.

In the network world, everyone can become a teacher and share his knowledge with others through the network platform. Through the search engine on the network platform, students can search for a large number of relevant knowledge on the network, and combined with the fields they don't know, they can get more and more comprehensive knowledge on the network. This is the so-called associative learning, which can effectively broaden students' learning horizon.

2.5 Application Process of Computer BD in Internet Learning
Computer BD is also in constant optimization and improvement. In terms of learning, the application of BD on the Internet online learning platform can be divided into the following aspects: course attendance rate, key and difficult points of knowledge, learning time statistics, information retrieval, etc. The collation of students' relevant information can be divided into the following parts: basic data, academic performance, learning duration, learning content, recording, summarizing and sorting out the key and difficult points.

(1) Find out the hidden knowledge with certain value
In the process of using the Internet for learning, the Internet technology has been constantly optimized and improved, thus forming related technologies and establishing an innovative comprehensive learning resource library. At the same time, the knowledge base is constantly expanding and upgrading, and the knowledge stored on the Internet platform is becoming more and more diversified and intelligent. Through network technology, students can not only learn the knowledge in textbooks, but also expand these knowledges, so as to learn more and more valuable knowledge.

(2) Overall arrangement of application procedures
In order to facilitate students to better complete Internet learning on the network platform, the learning process of BD online learning platform is mainly divided into the following aspects: students can freely choose what they want, and students can get the correct knowledge answers faster. In addition, the Internet platform also provides the question bank and data in accordance with the teaching materials by coordinating the online learning program, so as to ensure that students can acquire the latest knowledge in time.

2.6 Data Normalization
Standardization is a way to move the location and scale attributes of data. In this article, we use the standard score method to convert raw data to standard data, and then we can compare or add scores between items. The calculation formula is as follows:

\[
y_i = \frac{Y_i - \bar{Y}_j}{Z_j} \quad (i = 1,2,\cdots,n; \ j = 1,2,\cdots,m)
\]
For example, when predicting students' test scores, where $Y_i$ is the original data of the $i$ student's examination subject $j$, $\bar{Y}_j$ is the average score of examination subject $j$, and $Z_j$ is the standard deviation of examination subject $j$.

Let class $G_p$ and class $G_q$ be merged into a new class $G_r$, then the processed result is as follows:

$$D_{kr} = \frac{n_k + n_r}{n_k + n_r}D_{kp}^{2} + \frac{n_k + n_r}{n_k + n_r}D_{qr}^{2} - \frac{n_k}{n_k + n_r}D_{kr}^{2}$$  \hspace{1cm} (2)

In order to unify each index value into a common numerical characteristic range, this paper uses range transformation to get the value between 0 and 1. The calculation formula is as follows:

$$T'_j = \frac{T_j - \min_{i \in G_j}(T_i)}{\max_{i \in G_j}(T_i) - \min_{i \in G_j}(T_i)} \quad (i = 1, 2, \cdots, n; \ j = 1, 2, \cdots, m)$$  \hspace{1cm} (3)

3. Experimental Objects and Methods

3.1 Determination of Experimental Objects
According to the needs of the research, the author selects the freshmen of computer major of grade 2018 in a university as the research object of this experiment.

3.2 Determination of Online Learning Content
In this experiment, C language programming is selected as the experimental course, and video teaching resources are selected in the network learning platform for video teaching. C language course is a compulsory basic course for computer related majors in Colleges and universities. Therefore, the choice of this course, first of all, to ensure the enthusiasm of students to participate. Secondly, students will take their learning attitude seriously to lay a foundation for future research.

3.3 Implementation Method
Applying BD analysis to network teaching needs to formulate detailed plans and specific implementation steps. According to the specific needs of this study, this paper designs the following implementation methods and steps.

1. Upload C language programming video teaching resources. At the same time, participants are required to register their learning accounts on the learning platform, so as to carry out follow-up learning and prepare for the subsequent learning data collection of each learner.

2. For each C language course teaching video resources, the establishment of discussion area, online communication, question and answer, practice test and other activities.

3. Learners generate corresponding learning data in different learning activity modules, and use learning analysis technology to collect and analyze these data, and finally put forward corresponding feedback reports to learners and teachers.

3.4 Survey Methods
A total of 752 questionnaires were distributed to all teachers and students participating in the experiment, and 752 were valid. The experimental investigation project mainly includes the investigation of students' learning progress, the effectiveness of learning suggestions, and the mastery degree of curriculum knowledge.

4. Discussion

4.1 A Survey of Students’ Attention to their Learning Progress and Academic Performance
Compared with the traditional network-based learning environment, in the case of online learning using BDAT, the system will automatically send personal learning progress to learners, so that learners can know their learning progress at any time. According to the survey data, the survey results in Table 1 and
Figure 1 are sorted out. The survey results show that 49.09% of the students will pay more attention to their own learning progress, 42.41% of the students pay more attention to their own learning progress, 5.98% of the students generally pay attention to it, and only 2.52% of the students do not. Generally speaking, the vast majority of students will pay attention to their learning progress in the learning process, which is a good measure to promote students' learning sustainability. According to the helpful data of academic performance feedback, 54.35% thought it was very helpful, 41.66% said it was helpful, 2.47% had average effect, and 1.52% did not. The data show that the vast majority of students think that BD analysis learning feedback mechanism is helpful to their own learning.

Table 1 Questionnaire on students' learning progress

| Proportion (%) |
|----------------|
| Very concerned  | 49.09 |
| More attention  | 42.41 |
| General concerns| 5.98  |
| Not paying attention | 2.52 |

Fig.1 Analysis of the survey results of BD academic performance feedback

4.2 A Survey of Students' Mastery of Curriculum Knowledge

Fig.2 Analysis on the survey results of students' mastery of curriculum knowledge
In terms of students' mastery of curriculum knowledge, according to the survey data, the results of Figure 2 show that 34.6% of the students have a very deep mastery of the knowledge after completing the course, 55.7% of the students have mastered the course knowledge deeply, 6.3% in general and 3.4% in the very shallow. Generally speaking, the vast majority of students have a solid grasp of this course. Therefore, the introduction of BDAT in e-learning environment is of great help to learners' knowledge.

4.3 Advantages of Computer BD in Internet Learning
Computer BD has the characteristics of fast information processing, which is conducive to the rapid and efficient accumulation and storage of a large number of learning resources in the process of Internet learning. At the same time, more valuable learning data can be mined out. Compared with traditional learning methods, the combination of BD and Internet learning can greatly improve students' learning efficiency. In addition, students can use BD analysis and data filtering to make full use of learning resources.

At the same time, computer BD has an important advantage in network teaching mode, that is, it can improve students' learning efficiency from different angles. By recording and storing students' learning data, analyzing students' learning characteristics, through this way, it can not only help avoid unnecessary interference, deepen the grasp of learning key points, and ensure the quality of students' learning.

4.4 Shortcomings and Loopholes of BD in E-learning
Although BD can effectively help students with online learning, there are also deficiencies and loopholes in online learning. In practical application and learning, many chain education institutions will design corresponding application plates according to their own characteristics. In this case, the structural data information of BD itself is limited, which limits the classification and storage of knowledge, and even limits the information update, which is not conducive to students' timely understanding of the relevant implementation content, which is a loophole in BD network learning.

In addition, in the process of e-learning, many chain institutions will set up courses according to their own views and logic, and choose their own satisfied BD information and functions. However, in this era of constantly updated information, BD is also constantly pouring in and constantly updating. In this case, educational institutions will be independent.

Some educational enterprises will make full use of every educational innovation and update the data every time as a new breakthrough point, hoping to implement the new mode immediately. However, if it can't be implemented normally and too eager for success, it will face more problems, even destroy the balance of the original education, leading to wrong data analysis and use.

4.5 Application of Computer BD in Internet Learning Makes Learning More Intelligent
In the process of using the Internet, students can integrate the learning contents of different disciplines for cross learning, such as the cross knowledge points involved in chemistry and biology, and the cross knowledge involved in physics and chemistry. With the help of the Internet, students can integrate the contents of different disciplines and establish mind mapping, so as to systematically master the knowledge points of various disciplines and deepen their understanding. On the Internet BD learning platform, students' viewing and playback module is established to facilitate students' review and summary after class and improve learning efficiency. Return visit and on-demand function make up for the shortcomings of traditional teaching, students can learn relevant knowledge according to their own situation, so as to deepen the understanding of knowledge points.

5. Conclusions
BD is the most significant feature of today's era, and people's daily life is producing BD all the time. In recent years, BDAT has been well applied in various fields, and integrating BDAT into modern education field is one of the current hot topics. Traditional Internet learning has solved the problem of
distance education and made contribution to the promotion of China's modern education, but there are still some typical problems such as insufficient data analysis ability. In this paper, the integration of BDAT into the existing internet teaching platform can better solve the problem and effectively improve the data integration and data analysis ability of the learning platform. For students' learning experience, the corresponding analysis report forms are formed through BD technology, which plays a good auxiliary role in students' learning and teachers' teaching.

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