

Data Mining in Optimizing Kindergarten Curriculum under the Background of Big Data

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Abstract: With the development of educational informationization, the educational data of each school is increasing day by day. How to make rational use of the existing information to make scientific teaching decisions is a problem that every educator is closely concerned about. This paper mainly studies the application of data mining in optimizing kindergarten curriculum setting. This paper optimizes the physical intelligence course in kindergarten and forms a set of teaching mode integrating physical ability, intelligence and human ability organically. In order to test the scientific nature, operability and effectiveness of the teaching model, this study used the action research method to test the optimization results, and selected the experimental class and the control class for independent sample t test. The results show that there are significant differences in intelligence and human ability between the experimental class and the control class, and the children in the experimental class have improved significantly in these two aspects.

1. Introduction

In recent years, with the development of Internet and the deepening application of database technology, people have accumulated a large number of data, which is also one of the important characteristics of today's information society, is our precious wealth. But finding the useful information hidden in it is like looking for a needle in a haystack. With the rapid growth of data, the existing information management system in the data analysis tools have been unable to adapt to the new needs, because whether it is query, statistics or reports, its processing mode is a simple number of data processing, can not carry out a deep analysis of these data. It is desirable to have a solution that can provide higher-level data analysis capabilities and automatically and intelligently transform the pending data into useful information and knowledge. Data mining is to solve the shortcomings

of traditional analysis methods for large-scale data analysis and processing. Data mining, as the name suggests, is an advanced process of mining hidden, previously unknown knowledge and rules from large amounts of data that are potentially valuable for decision making. Now it has been adopted in more and more fields, and has achieved satisfactory results in government management, commercial operation, enterprise decision support, marketing, financial investment, social insurance, medicine, astronomy, geology and scientific research and other fields [1]. It is very necessary and feasible to find the curricular rules or patterns hidden in the data by means of corresponding data mining tools to provide support for decision making.

On the whole, the application of data mining technology in all aspects of education is gradually developing, but from the specific point of view, the use of data mining technology for curriculum correlation analysis needs further research. Valls mainly focuses on using data mining technology to build early warning models. Data statistics were used to carry out low warning, cluster analysis was used to carry out landslide warning, and association rule analysis was used to find the relevance among all courses [2]. Neto adopted association rules and hierarchical association rules to obtain the relevance between courses, core courses and important skills, and then constructed the curriculum system of the major based on the project-based curriculum teaching model [3].

On the basis of previous studies, this study put forward curriculum correlation analysis and application research based on data mining technology, and conducted empirical study with a large number of curriculum data, and obtained the curriculum relevance reflected by the actual situation of kindergarten curriculum. These statistical curriculum correlations are used to provide further decision support for kindergarten curriculum setting.

2. Optimizing Course Setting Based on Data Mining

2.1. Data Mining Process

Data mining is the process of finding useful knowledge by exploring and analyzing massive data. In fact, it uses some specific algorithms to extract data patterns from preprocessed data, and then evaluates and represents the patterns to present valuable information. Data mining consists of three basic processes: data preparation, data mining and result evaluation and interpretation, combined with the data collection process [4].

As an important stage before data analysis, data preparation is directly related to the effectiveness of mining results. Before data preparation, I should first determine what data I need to collect, and then collect data in various ways according to the task, such as online collection, crawler or direct sorting of existing data [5]. The data source obtained may have redundancy, non-standard naming, missing and other problems, and cannot be directly used for data mining, so further data preprocessing is needed.

After the data preparation stage, the preprocessed data can be obtained, and the appropriate data mining methods and specific algorithms can be selected according to the determined mining tasks. The quality and speed of mining modes of different algorithms are different. Generally, we should consider two factors when choosing mining methods and algorithms. One is to see whether users want to acquire classified predictive or descriptive knowledge according to the needs of users. Second, according to the characteristics of the data, as the different characteristics of different data will affect the analysis results, the appropriate methods and algorithms should be selected [6]. Finally, after selecting the appropriate algorithm, the corresponding pattern can be obtained.

After the data mining stage, the corresponding results will be obtained. However, the results of mining are not all what we need, so we need to evaluate the results, remove redundant and

irrelevant results, and get useful information. If the mining results cannot meet our requirements, we need to go back to reset the algorithm parameters, or re-select the data source, or even re-select the mining algorithm, etc. When the obtained data mining mode has certain value, the results need to be further analyzed, interpreted and transformed into a way that is easy for us to understand [7].

In general, data mining is a process of constant loop and feedback. Improper handling of each link may cause the final mining result to be inconsistent with the expectation, but we can all go back to the previous process and choose more appropriate data and mining algorithm for re-analysis. Generally, there are two factors affecting the quality of mining results: one is determined by the quality and quantity of mined data; on the other hand, it is determined by the effectiveness of the selected algorithm [8]. Therefore, from data collection to data mining, it is necessary to use as many data as possible and mining algorithms that are more suitable for these data. Once invalid data is used, or the preprocessing is not appropriate, we need to go back to the previous process or even start over in order to gain meaningful knowledge.

2.2. Course Optimization

This study use the teaching goal of teaching cases for the optimization of concrete, the choice of course use equipment is tires, as a cognitive and thinking, the teacher must have professional should first consider the tire is to cultivate children's balance ability, for weight control ability and the ability of hands and feet coordination, on this basis to consider how activities can develop children's intelligence and person, go to stand in the perspective of comprehensive analysis.

Teaching content is the basis for the design of teaching links. In this study, the overall design and optimization of the lead-in links and the theme links are carried out. By grasping the key points and breaking through the difficulties, the tire is used as the instrument for teaching, from easy to difficult, so that children can improve their activity enthusiasm and ability.

Introduction is the first of the whole lesson, its main task is to quickly organize children. The original teaching plan is a simple rhythmic warm-up, head, arms, shoulders and other parts, the lack of scene, music leads to low activity of children, sports passion is hindered. The content of the warm-up link is random and rigid, and lacks of psychological awakening for children. Based on the tire teaching aid, this study sets the tone of the whole teaching plan, adds the character setting of cartoon images, uses the songs in cartoons, awakens the children's musical intelligence, lets the children get infected in the music atmosphere, and constructs the scene.

The second step of teaching idea construction is to learn the tire rolling method to enrich children's cognition and develop their intelligence. Design after the import is the plot construction, teacher to cartoon image of the lead children into the scene, the suitable plot construction to promote children to trust and kindness of the teacher, to enrich young children's visual - spatial intelligence, improve children's imagination, close to the children's life, in the situation of experience method to let children experience the sense of reality, and gain a sense of mission [9].

The teacher's demonstration is very important to the practice of movement. How to make children learn the essentials of movement slowly? First of all, we should master the ability to control heavy objects and coordinate hands and feet, maintain a certain balance, and develop children's body-movement intelligence by practicing tire rolling. In the original teaching plan, two children roll tires face to face. The content is boring and the children are not interested in it. In this study, this section is changed into two parts. The first part is children's face to face practice to improve their familiarity with tire rolling and their proficiency in movements. In addition, music elements are added to exercise children's sense of rhythm and develop their musical intelligence in

activities. The second part is the cooperation of two children, two children push the tire together to move forward, exercise children's interpersonal intelligence, and complete the teaching difficulties in this design.

The second half of the teaching content is the highest stage of children's emotion and activity. Teachers should be aware of the appropriateness of play. This study uses the cooperative competition method: children are divided into two teams, children are asked to name their own team, so that children's sense of mission is enhanced, exercise children's team consciousness, the plot of adventure into the story, we are required to prepare for the layout of the site and reward, so that children's mood and state to reach the peak state.

3. Specific Optimization and Results of Teaching Methods

Teaching method is the means and method of teaching content application, including teaching method and teaching form. This research also pays attention to this point in the process of optimization. Situational experience method, cooperative competition method and small step gradual method are mostly used in teaching method to promote children's subjectivity. Cartoon scene construction, let children experience the real scene, from the learning-exercise-play line construction, small steps to promote the development of children's ability, the use of two-person cooperation and team cooperation to cultivate children's team consciousness. In the form of teaching in groups and individual form, the formation of good management, to promote the form of development, to avoid the neglect of children's individual education in the collective, hinder the teaching in accordance with their aptitude. Reasonable teaching methods are the key to the good implementation of teaching objectives and contents. Teachers need to take professional consideration and thinking when preparing teaching plans and avoid arbitrariness by all means [10].

3.1. Research Steps and Plan

In this study, the plan-action-reflection step was adopted to plan the research process, and the cooperative action research method was adopted to cooperate with a physical intelligence teacher in a kindergarten who carried out physical intelligence courses for children. The researchers mainly tested the effect of optimization by recording. The object of action selected in this study is two middle class children in a kindergarten. Under the condition of ensuring the attendance rate, the study is carried out on the children in the class. In the previous content, the teaching objectives, content and methods of the original teaching plan have been optimized.

Of this study is to extract some experimental classes of student ages children (22) and that in comparative classes (20), two class children's body intelligence course by a teacher have a class, the teacher to reflect two class early childhood development synchronization, this study still by the same body smart teacher for the class, considering the physical quality in a class has obvious improvement, thus the research on the basis of the outline of the kindergarten education guidance, the 3-6 years old children's learning and development guide to extract intelligence, social adaptability of several indexes of children was tested. Course of recorded by camera and invite related graduate and body smart teacher repeated watching videos, according to the index using the method of five points assignment for children's intelligence development can undertake unity with people professional grade, researchers analyze the collected data and finishing, and the experimental classes and the intelligence of that in comparative classes and social adaptability of an independent sample t-test, comparing the difference between the two classes are significant.

The t-test formula used in this paper is as follows:

$$t = \frac{\bar{X} - \mu}{\frac{\sigma_X}{\sqrt{n-1}}} \quad (1)$$

$$t = \frac{\bar{X} - \mu}{\frac{\sigma_X}{\sqrt{n}}} \quad (2)$$

4. Structural Analysis and Reflection on Curriculum Optimization

4.1. Control Class Indicators

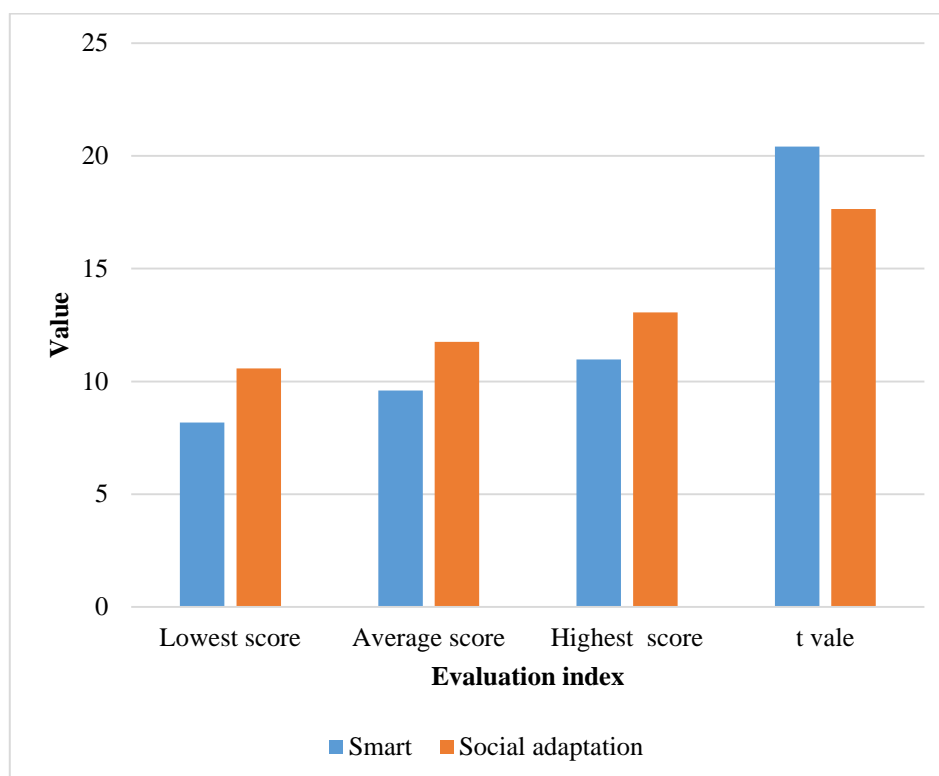


Figure1. Contrast various indicators of the class

As shown in Figure 1, children in the control class had the lowest score of intelligence index of 8.18, average score of 9.6, and highest score of 10.97. The lowest score of social adaptability index was 10.58, the average score was 11.76, and the highest score was 13.06.

4.2. Experimental Class

Table1. Experiment all kinds of indicators

	Lowest score	Average score	Highest score	t vale
Smart	18.18	20.04	21.87	20.41
Social adaptation	17.97	19.54	21.09	17.65

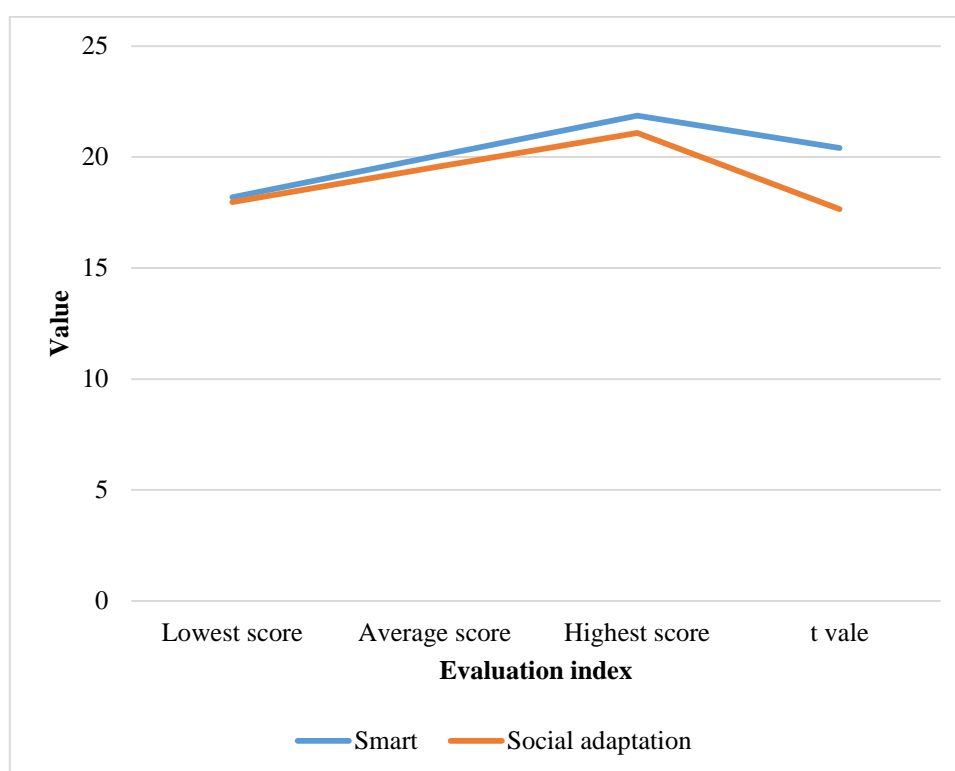


Figure 2. Experiment all kinds of indicators

As shown in Table 2 and Figure 2, the average intelligence score of the experimental class is 20.04, and the social adaptability score is 19.54. There is a very significant difference in intelligence data ($P < 0.01$), and there is also a very significant difference in social adaptability data ($P < 0.01$). The above data indicate that the specific children physical intelligence course cases optimized in this study have been significantly improved in the aspects of intelligence and human ability. The phenomenon that physical intelligence teachers lay emphasis on the teaching content has been changed. It is believed that in the slow process of optimization, children's physical ability, intelligence and human ability will be further developed.

5. Conclusion

With the increasing number of students' various information, how to make reasonable use of the existing information to improve the quality of talent cultivation is a problem that every educator is closely concerned about. Applying data mining technology to education industry, meaningful information can be found from large amounts of data to provide decision support for educators. In this paper, the teaching mode of infant physical intelligence course combined with data mining is used to optimize specific teaching cases to test the effect of optimization. It is hoped that this study can strengthen physical intelligence teachers' professional understanding of physical intelligence curriculum connotation, arouse the high attention of kindergartens and relevant institutions, and promote the in-depth promotion of physical intelligence curriculum for children.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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