



Application of Data Mining Simulation Algorithm in Physical Education Teaching Evaluation

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Abstract. The application of data mining simulation algorithm in physical education teaching evaluation is a process of using computer simulation model to evaluate. The use of simulation models is not new, but researchers have only recently used them in this way. Simulation models are often used to evaluate educational programs or courses (for example, to test whether the program improves outcomes). In these models can be used to assess the effectiveness of Instructional Technology (e.g., how much time should be spent in each class) and to determine which instructional strategies work best under what conditions (e.g., what type).

Keywords: Data mining · Physical education teaching evaluation · Simulation algorithm

1 Introduction

In the 20th century, educational science research developed rapidly, forming a huge educational science system. Research on basic theories of education have become the three major fields of modern educational scientific research [1]. Educational measurement and evaluation is an applied discipline with the characteristics of comprehensiveness, technicality, practicality and applicability in the educational science system. It is a skill and method that people usually rely on to guide educational practice according to the basic theories and laws of education. Its core part is teaching evaluation.

Teaching evaluation. It takes teaching objectives as the basis, uses effective evaluation techniques and means, measures, analyzes, compares, and gives. Teaching rose in the United States in the 1930s. It flourished in the western world and spread to China in the 1960s. It widely exists in various practical and is an indispensable work.

The of information education great to education. The way of teaching evaluation has also shifted from traditional symposiums, questionnaires and expert lectures to online evaluation. Online evaluation the network, which is not, convenient and fast, to collect the teaching evaluation data, and use the powerful information processing ability of the computer to statistically process the teaching evaluation result data, which can improve the fairness, effectiveness and credibility [2]. At the same time, using data mining,

artificial intelligence and other technologies can find useful knowledge and rules in the evaluation results, and further guide teaching.

As one of the important tools to measure the process and effect of PE teaching, PE teaching evaluation can not only reflect the shortcomings of PE teaching; It can also help students find problems in the efficiency. Exploring the evaluation has a positive significance both in theory and practice.

2 Related Work

2.1 Research Status Abroad

At present, there mature systems in the theoretical of teaching evaluation abroad. Such as multiple intelligences theory, humanism theory, developmental teacher evaluation theory and “the fourth generation of education evaluation theory”. As mentioned above, the theory of multiple intelligences classifies people’s intelligence into eight types, and holds that each type of intelligence represents different abilities, each type of intelligence needs to be developed, and each type of intelligence needs different evaluation methods. Humanistic theory emphasizes the value and potential of human beings, pays attention to the self realization of human beings, and believes that evaluation must be people-oriented [3]. The theory of developmental teacher evaluation thinks that teachers should be aware of teaching problems and their own shortcomings through the evaluation of experts, students and themselves, and promote teachers’ teaching work and self-improvement through the feedback control mechanism. “The fourth generation of educational evaluation theory” has absorbed the reasonable elements of the above theories. Its main points are as follows: (1) it emphasizes that the complete and individualized people are the object of evaluation, and through evaluation, it promotes the full development of the educatees’ personality, and pays attention to qualitative analysis; (2) It is advocated to evaluate their own development process from the internal needs and actual conditions of students’ development, generally using the individual reference evaluation method; (3) Adhere to the humanitarian spirit, organize evaluation activities in a good interpersonal atmosphere of mutual trust and respect, and fully reflect respect for personality, trust in ability and concern for development; (4) Pay attention to self-evaluation, adhere to the democracy of evaluation, and emphasize the habit and ability of self-analysis, self-evaluation and self-regulation in the process of evaluation; (5) Considering the needs of all participants, it is considered that the evaluation is a coordination process and the evaluation result is an inseparable isomorphic process for both sides of the evaluation; (6) Emphasize “value diversity”, advocate fully listening. Therefore, it also advocates diversified evaluation.

In terms of teaching evaluation software, “question mark” and “rubric star” are well-known in foreign countries. With the education and teaching evaluation theory, these software continue to release new versions. In some aspects, they can be used as teaching evaluation tools, but their ability to support the integration of teaching process and evaluation process is quite poor; However, teaching evaluation software systems such as “smart” have lost the flexibility to support different teaching theories and teaching contents due to their overemphasis on the integration with specific teaching processes.

2.2 Domestic Research Status

At present, domestic theoretical research is mainly based on absorbing and utilizing foreign theories. The project team of the national basic education curriculum reform “Research on the for promoting teachers’ growth and development” took the lead in conducting research on developmental evaluation and achieved some results. There are more and more researches on diversified teaching evaluation.

In terms of teaching evaluation software, there are “online student evaluation system” jointly developed by Nanjing Xunji Technology Co., Ltd. and the Academic Affairs Office of Nanjing Forestry University, and “Jinzhong network teacher evaluation system” and “Jinzhong network student evaluation system” developed by Beijing Jinzhong Network Information Engineering Co., Ltd. These evaluation systems are all based on Web, which realize efficient teaching evaluation without time and space constraints [4]. However, their evaluation model is single, the evaluation subject and evaluation object are few, and they are closely coupled with the teaching system, so they do not have universality and can not achieve diversified evaluation. Recently, the design and development of “E-Learning archives” software system has risen, which has preliminarily realized the support of information technology for process teaching evaluation, but it is still very imperfect and its application is very narrow.

3 Physical Education Teaching Evaluation

3.1 Classification of Teaching Evaluation

Relative evaluation refers to the evaluation in which one or several objects are selected as the standard in the set of evaluation objects, and then the rest of the evaluation objects are compared with the standard, or the evaluation in which all the evaluation objects are arranged in order in some way. Through comparison, the the evaluated object in the set can be determined. Relative evaluation is mainly used in selective and competitive activities, and is often used in network teaching evaluation.

Absolute evaluation refers to the evaluation that determines an objective standard in advance outside the set of evaluation objects, compares the evaluation objects with the evaluation standard, and judges the degree of reaching the standard. It is mainly used for qualification and compliance activities.

Intra individual difference evaluation is to compare the past and present of each individual in the overall set of evaluation objects, or compare several aspects of an individual with each other. It is often used in two situations. One is to compare the past and present of the evaluation object. One is to compare some aspects of the evaluation object. The comparison between the past and the present of an individual can enable the evaluation object to understand their own development, and the comparison of various aspects of an individual can enable the evaluation object to understand their own advantages and disadvantages and make self-regulation.

Self evaluation is that evaluators evaluate themselves according to certain evaluation criteria. For example, teachers’ evaluation of their teaching ideas, contents, methods, attitudes and effects.

Others' evaluation refers to the evaluation conducted by others other than the evaluated person, also known as "external evaluation". For example, students' evaluation of teachers, teachers' mutual evaluation, etc.

3.2 Principles of Constructing the Evaluation System of Physical Education Teaching in Colleges and Universities

The design of college physical education teaching evaluation system under the background of big data application should be based on theory and from all aspects of physical education teaching process, and mainly meet the following principles:

- (1) The principles of scientificity and objectivity. In combination with the background and characteristics of the big data era, and on the basis of objective laws and practice, the construction of college physical education teaching evaluation is carried out scientifically and objectively. For example, the selection of evaluation indicators should be based on the collected and investigated data to make reasonable screening, so as to ensure the scientificity and objectivity of evaluation indicators.
- (2) Integrity and comprehensiveness. That is, when constructing the evaluation system of physical education teaching in Colleges and universities, the selection of evaluation indicators should be comprehensive, not repeated, well-organized, widely representative, and can basically show the whole process of physical education teaching.
- (3) Feasibility and testability principles. Feasibility means that the way of evaluating physical education teaching has practical operability. Measurability means that the evaluation of evaluation indicators has testable and quantitative standards. For example, the selection of indicators must be easy to understand and measure without ambiguous indicators.

4 PE Teaching Evaluation Based on Data Mining Simulation Algorithm

4.1 Exploring the Construction of the Main Body Framework of Physical Education Teaching Evaluation in Colleges and Universities

The evaluation of physical education teaching in universities is an important component of the national education evaluation system, and also an important means to ensure the quality of physical education teaching in universities and the comprehensive development of students' physical fitness. This article aims to explore the methods and principles of constructing a framework for the evaluation of physical education teaching in universities. Firstly, the evaluation of physical education teaching in universities requires diversified and scientific evaluation indicators. In this context, this article proposes the basic principles for constructing a framework for the evaluation of physical education teaching in universities, including scientificity, diversity, practicality, and adaptability. These principles will help evaluate the multifaceted performance of the subject. Secondly, specifically regarding the method of constructing the main framework, this article proposes the following steps: the first step is to clarify the evaluation subject. The evaluation subject includes the evaluator, the evaluatee, and the evaluatee, and their respective

roles and responsibilities need to be clearly defined. The second step is to determine the evaluation index system. This system can include multiple aspects such as physical fitness, classroom performance, competitive performance, comprehensive ability, etc. It needs to be scientifically reasonable and take into account national and industry standards. The third step is to apply appropriate evaluation methods and tools. Different evaluation indicators require different evaluation methods, such as questionnaire surveys, field visits, and skill tests. Finally, this article points out the practical significance and application prospects of constructing a framework for the evaluation of physical education teaching in universities. Practice has proven that a correct evaluation subject framework can improve the quality of teaching and the comprehensive development of students' physical fitness, promoting their diversified growth. At the same time, the construction of the evaluation framework for physical education teaching in universities can also provide useful experience and reference for the reform and development of the evaluation system.

Therefore, when constructing the evaluation system for physical education teaching in universities, we should recognize that different evaluation subjects have different roles, and clarify the commonalities and personalities between each subject through evaluation indicators and indicator weights, namely physical education teachers, students, peers, and physical education teaching leaders. The specific framework is shown in Fig. 1.

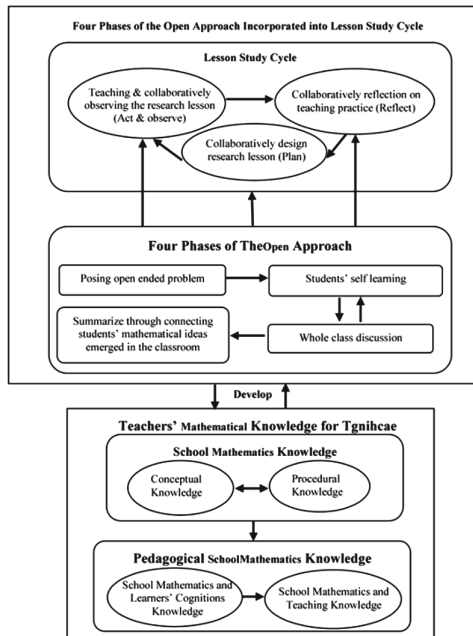


Fig. 1. The main frame of physical education teaching evaluation

4.2 Exploring and Constructing the Evaluation Process of Physical Education Teaching in Colleges and Universities

The evaluation of physical education teaching in universities is conducted to improve teaching quality and ensure the comprehensive development of students' physical fitness. The evaluation process mainly includes the following steps: first, clarify the evaluation objectives and indicators, and determine the focus and content of the evaluation; Then determine the evaluation methods and methods, commonly used methods include questionnaire survey, on-site observation, and skill testing; Next, collect and organize evaluation data, and conduct data analysis and processing; Finally, based on the evaluation results, evaluate the existing teaching quality and students' physical fitness, and propose corresponding improvement measures and suggestions to achieve the goal of improving teaching quality and students' physical fitness. Throughout the entire evaluation process, it is necessary to attach great importance to feedback from teachers and students, pay attention to the scientific and practical nature of evaluation indicators, and ensure the fairness and reliability of evaluation results. The specific process is shown in Fig. 2.

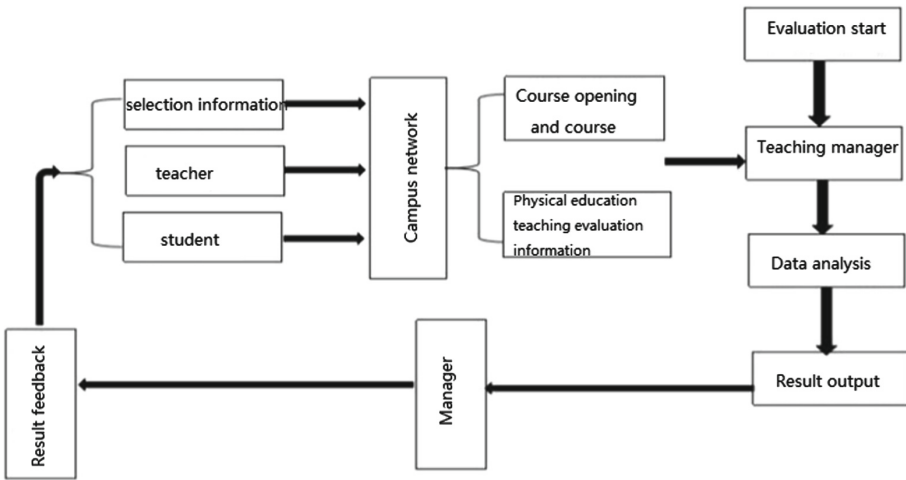


Fig. 2. Evaluation process of physical education teaching

5 Conclusion

The application of data mining simulation algorithms in physical education teaching evaluation can help educators evaluate students' physical fitness and comprehensive abilities more comprehensively and scientifically. Simulation algorithms can analyze and process a large amount of data from students' learning process, extract effective information from it, discover correlation and regularity, and predict and simulate during the evaluation process. This method can not only reduce the complexity and subjectivity

of evaluation work, reduce the burden on evaluators, but also more accurately evaluate students' physical fitness, classroom performance, competitive performance, and comprehensive abilities. At the same time, data mining simulation algorithms can also provide important references and guidance for educators, improve teaching plans and methods, and promote students' physical fitness and comprehensive development. Therefore, data mining simulation algorithms have broad application prospects and profound significance in physical education teaching evaluation.

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