

Design of College Physical Education Teaching Resources Database Based on Computer Information Technology

Xiaohua Li*

School of Physical Education, Hunan University of Arts and Science, Changde 415000, Hunan, China

17075106@qq.com

**Corresponding author*

Keywords: Teaching Resources, College Physical Education, Database Design, Education Informatization

Abstract: In recent years, with the accelerating development of the informatization of physical education in universities in my country, the physical education teaching resource database based on computer information technology, as an informatization infrastructure construction, plays an increasingly prominent role in the development of university physical education. In this context, this article aims to study the design of university physical education resources database based on computer information technology. This paper investigates the current construction status and design goals of the university physical education resource database through a questionnaire survey method, explains the functions of the university physical education database in detail, and puts forward suggestions for the design of the university physical education resource database.

1. Introduction

With the deep integration of computer information technology and teaching, the development process of teaching resource database is becoming more and more standardized [1-2]. Excellent teaching resources in each subject have been accumulated to a certain extent, and university physical education is no exception. How to select and obtain high-quality university physical education resources and apply them to teaching practice, so that many university physical education resources are not wasted, and to maximize the role of auxiliary teaching, it is worth our serious consideration [3-4]. Research on the construction of university physical education resources database based on computer technology has important practical significance in promoting the effective integration and application of teaching resources [5].

Many scholars have conducted in-depth discussions on the research of university physical education. For example, Shi X pointed out that, different from the traditional university physical education model, to give play to the advantages of online university physical education, it must

have a variety of forms and rich content. Ding Y pointed out that the resources of the teaching resource management system are mainly used for teaching, and whether the teaching efficiency is improved is one of the important criteria to measure the system, rather than the construction of a large number of resource management systems as the goal [7].

This article focuses on the design of university physical education resources database based on computer information technology. First, through the questionnaire survey method, taking 3 universities in H city as examples, to explore the current situation and design goals of the university physical education resource database. Then, the functions of the university physical education database are described in detail, including the functions of resource search, courseware management, online Q&A discussion, etc., and suggestions for the design of university physical education resources database are put forward in order to provide reference for the design of university physical education resources database.

2. Design of University Physical Education Resource Database Based on Computer Information Technology

2.1 Database Function of University Physical Education Resources Based on Computer Information Technology

(1) Resource search

Resource search is the most basic function of the resource database, especially for the current phenomenon of "scattered" college physical education resources [8-9]. The resource search function should break the traditional single search function and provide users with multiple search methods, such as resource navigation, keyword search, topic search, name search, etc., so that learners can search for the resources they want accurately and quickly. The resource search method of the university physical education resource database can be searched by knowledge points, textbook edition chapters, and even search by region, and each search method is set with more specific operations. This diversified the precise search method can ensure that the resources that have been searched are all the resources related to the topic in the resource database.

(2) Resource data management

Traditional resource data management is the integration of resources in the resource library, mainly for resource review, resource query, resource preview, resource upload and download, resource deletion, resource collection, resource utilization statistics, and resource the management of resources is completed by means of request.

The resource supply (resource upload), resource data download and part of the resource review rights of the university physical education resource database should be handed over to users, and high-quality university physical education resources can be selected through mechanisms such as user evaluation, browsing frequency analysis, and download statistics. In order to maintain the "dynamic" of the entire resource database.

In addition, the resource data management method of the university physical education resource database should also pay attention to improving the university physical education resource request. Due to the wide range and uncertainty of user needs, there will be no search for courses related to the subject, or search results the course is not what you want. At this time, you can use the resource request method to send a request to the resource library administrator [10-11]. Resource library administrators should pay attention to resource requests sent by users, reply in time and provide solutions for them.

(3) Resource and data sharing

Realizing resource and data sharing is the original intention of building a resource database, and it is also a function of the resource database. Resource sharing, as the name implies, to enjoy the use

of resources together means that resources are provided to any user for use without any authority or charge. Resource sharing does not mean that users can abuse resources for profit or other purposes. Therefore, while sharing resources, the property rights of resource developers must also be protected. How to take into account the sharing and protection of resources at the same time is a problem that resource managers should consider.

(4) Personalized learning

Individualized learning refers to a learning paradigm based on reflecting the differences of students' individuality and aiming at promoting the development of students' individuality. When different learners use the resources in the resource library for learning, they also need to provide personalized learning functions, comprehensively evaluate and discover the problems faced by the learners, and propose corresponding solutions based on the problems[12-14]. The construction of a new type of resource database is not simply to classify and accumulate resources, but to provide learning assistance according to the learning needs of learners. Therefore, the university physical education resource database should have the function of providing learners with personalized learning.

2.2 Suggestions on the Construction of University Physical Education Resources Database

(1) Take the construction of university informatization as the basic work

University education and teaching resource library is the highlight of university informatization construction. Informatization construction is the foundation of basic resource library construction. Realizing teaching reform and innovation is the goal of resource library construction, and it is the process of realizing quantitative change to quality. University teaching informatization provides massive high-quality digital education resources for university physical education, promotes resource fragmentation, quality, specialization and sharing, and enables high-quality educational resources to expand their coverage at a lower cost and at a faster speed; information informatization has innovated the content of education and optimized the teaching process; informatization is conducive to the construction of university faculty, is conducive to the improvement of management efficiency, and is conducive to the improvement of social service capabilities. Therefore, strengthening the construction of university information is the basic work of teaching resource database construction and an important support for improving the quality of university physical education.

(2) Comprehensive development of generative teaching resources

The so-called generative teaching resources refer to the study notes, homework, test questions, etc. generated by learners through writing, speech or emotions in the teaching process, discussing the questions raised during the inquiry process, opinions expressed, and suggestions, including teacher evaluation and guidance both can be regarded as generative teaching resources in the learning process. Therefore, in the process of using the teaching resource database, we must pay attention to the development and utilization of generative teaching resources[15-16]. The builders of the resource database should be conscious and proactive, and be good at using the learners' generative resources such as course evaluation information, discussion and exchange information, etc. Course resources and materials are optimized and developed. In addition, the resource database itself should be equipped with learning notes, discussions and exchanges, practice tests, etc. that are generated during online learning by different users to track learning records, archive and share in real time, to achieve the development of generative teaching resources.

(3) Establish resource evaluation standards

Everyone has different views on the understanding of things, and due to the huge amount of educational resources and the complicated content, a large number of educational resources with

different hierarchical structures and different attributes appear, which is not conducive to management and application. In order to build a professional teaching resource library more effectively, promote data and information sharing, improve the efficiency and accuracy of retrieval, and ensure the quality of resource construction, it is very necessary to establish resource evaluation standards. Therefore, establish resource evaluation standards to evaluate the process of resource integration in the database and the later trial and use of the resources to ensure the educational, scientific, technical, and artistic nature of the resources, unify the resource specifications, and ensure the authenticity, accuracy and reliability of the resources. The sex is fully guaranteed, and the resources of the professional teaching resource library are shared.

(4) Enhance teachers' ability to apply modern information technology

Teachers' modern information technology application ability is a key factor for the in-depth promotion of education informatization, and an important factor for the sustainable development of university physical education resource database, which directly determines teaching reform and innovation. Teachers must have sensitive and accurate insight into things and the ability to judge things, be able to quickly perceive the technology and equipment updates of the actual production activities of industry enterprises, and quickly update and improve the corresponding teaching resources and sports skills. Ensure that the resources in the library are continuously updated and improved, and that learners can master the latest sports skills in a timely manner.

3. Investigation and Research on the Design of University Physical Education Resources Database Based on Computer Information Technology

3.1 Survey Design

In order to further understand the problems of universities in the construction of physical education resource data, this study selected H city, which has a more complex and diverse construction of digital teaching resources, as a research case, including three different types of schools in the city and district under the jurisdiction of the city. Investigation and research on the construction of digital resources are conducted in School A, School B and School C.

This survey mainly takes two forms of questionnaire survey and interview survey. The purpose of the questionnaire survey is to understand the basic situation of the construction of physical education resources in 3 schools, while the purpose of the interview is to make up for the limitations of the questionnaire survey and to obtain specific details of the school's construction of the teaching resource database.

3.2 Investigation Implementation

(1) Subjects of the questionnaire

There are 60 physical education teachers in School A, School B, and School C under the jurisdiction of City H.

(2) Questionnaire design

The questionnaire design mainly includes four parts: the first is about the basic situation of teachers, including teachers' gender, teaching age, and the type of school to which they belong; the second is the knowledge and attitude of teachers to the digitization of college physical education resources, including the degree of understanding of the digitization of college physical education resources; the third is the development of the school's teaching resource database; the fourth is the suggestion on the construction of the teaching resource database.

(3) Issuance and collection of questionnaires

In order to be able to truly and objectively understand the relevant situation of the school's digital resource construction, the questionnaire was filled out in an anonymous manner. A total of 180 questionnaires were distributed, and 169 valid questionnaires were collected and sorted out, with an effective rate of 93.89%

(4) Reliability analysis

Reliability analysis is an important process of content analysis. Only through strict reliability analysis can the content analysis results be reliable. The reliability formula of content analysis used in this study is:

$$R = \frac{n \times K}{1 + (N - 1) \times \bar{K}} \quad (1)$$

In the formula, R stands for reliability, K refers to the degree of mutual agreement between two judges, \bar{K} refers to the average of the degree of mutual agreement between the judges, and the K value calculation formula is:

$$K = \frac{2M}{N_1 + N_2} \quad (2)$$

M is a column that both agree completely, N_1 is the number of columns analyzed by the first judge, and N_2 is the number of columns analyzed by the second judge.

4. Data Analysis of University Physical Education Resource Database Construction

4.1 Status Quo of University Physical Education Resource Database Construction

The construction of the teaching resource database is to better realize teaching and improve teaching quality. In the information environment, the application of digital teaching resources can realize the integration of computer information technology and courses. In addition to using information technology as a means of assisting teaching, it can also be used as a cognitive tool for student learning, providing students with a learning environment for independent exploration and collaborative learning, and mobilizing students' enthusiasm for learning. The university physical education resource database developed by the H city school creates a good environment and conditions for information technology and curriculum integration. Students can learn independently through platform resources and adopt different methods to achieve their learning goals.

The results of questionnaire surveys and interviews can also reflect this status quo. First of all, the overall survey results on the "types of learning activities that can be supported by the teaching resources you develop" are shown in Table 1: the proportion of "online learning" resources for physical education teaching in the three universities is 36.69%, 30.18%, and 25.44%, respectively.

Table 1: Types of physical education resources development (%)

	School A	School B	School C
Classroom learning	44.97	49.70	52.67
e-learning	36.69	30.18	25.44
Self-learning	10.65	20.12	15.38
other	7.69	0	6.51

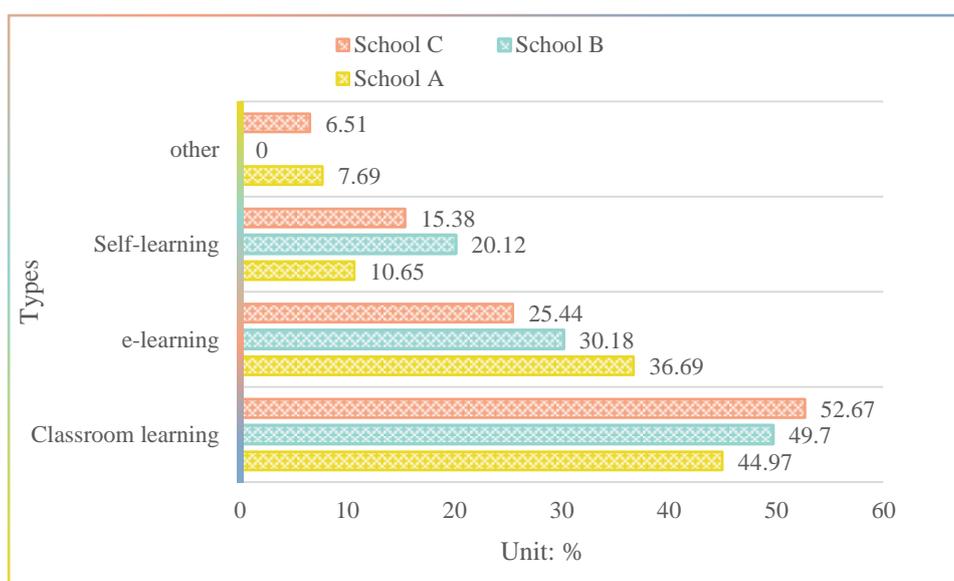


Figure 1: Types of physical education resources development (%)

From Figure 1, the school has designed different types of resources during the informatization of physical education teaching, most of which are aimed at classroom learning, some of which support students' online learning and autonomous learning, and a small number of other types of resources. It can be seen that most of the schools in the implementation of teaching are based on traditional classroom learning, and they are also exploring online learning methods to guide students to learn independently. This reflects to a certain extent that schools are constantly promoting innovation in learning methods. The construction consciousness of the physical education resource database is constantly improving.

4.2 Teacher Information Literacy

As the main body of teaching resource development, teachers' own knowledge and understanding of digital teaching resources directly affect the quality of resource development and application. In order to understand the teacher's understanding of the digitization of teaching resources, a survey of related issues is carried out. The overall situation of physical education teachers' understanding of the digitalization of teaching resources is shown in Table 2: the proportions of the three college teachers who have a good understanding of "digital teaching resources" are 15.92%, 9.46% and 17.75%, respectively.

Table 2: Digital understanding of teaching resources (%)

	School A	School B	School C
Know very well	15.92	9.46	17.75
Better understand	56.80	56.21	49.70
Know less	23.08	30.77	32.55
Don't understand	4.14	3.56	0

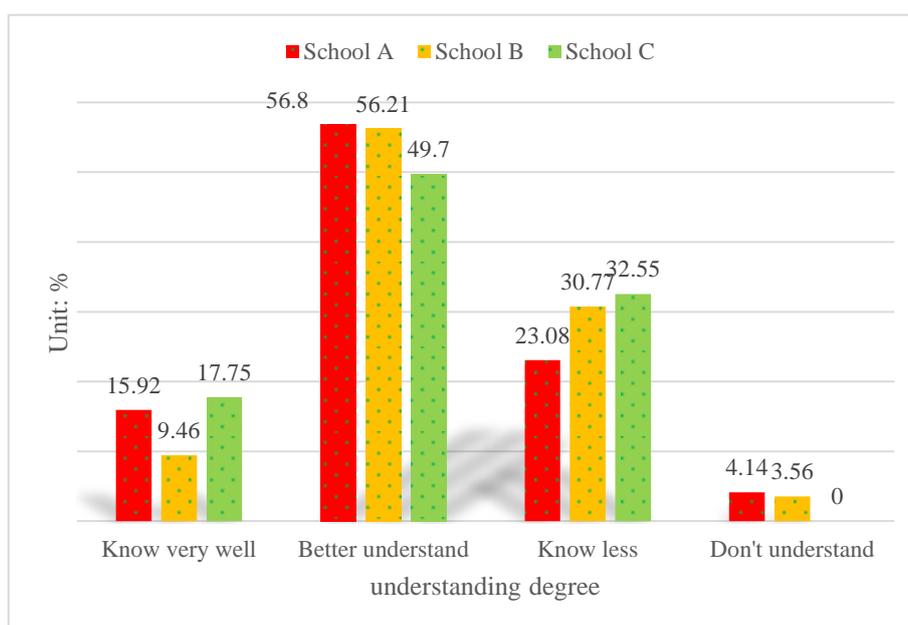


Figure 2: Digital understanding of teaching resources (%)

It can be seen from Figure 2 that there are still teachers who know little about digital teaching resources, and even 7.70% of teachers do not. The distribution of each school is consistent with the overall distribution. It is common in all schools that they have relatively little knowledge and less understanding of digital teaching resources, and at the same time, there are fewer people who know and do not know very well. It can be seen that the theoretical understanding of the dataization of teachers' teaching resources needs to be further improved.

5. Conclusions

With the construction and application of the university physical education resource database, the use of computer information technology to reform and innovate the existing teaching model has been realized, and more high-quality professional teaching resources can be allocated to more university physical education learners. Physical education learners provide a new personalized learning platform. The ultimate goal of university physical education resource database construction is to assist teaching. It should be developed and constructed in accordance with corresponding technical specifications and standards. It should be based on highly shared and diverse forms of high-quality teaching resources, and finally become a platform system that supports open teaching.

Acknowledgments

This research was benefited by grants from Hunan Social Science Achievement Evaluation Committee (XSP22YBC175), Changde Social Science Achievement Evaluation Committee (CSP22ZZ03), National Institute of Computer Basic Education in Colleges and Universities/Teaching Research of Computer Basic Education (2022-AFCEC-060).

References

[1] J Wang, P Wang. *Design Method of Auxiliary Platform for College Physical Education Teaching Based on Campus Network*. IOP Conference Series Materials Science and Engineering, 2020, 750:012062, 10.1088/1757-899X/750/1/012062

- [2] Y Ding, Y Li, Cheng L. *Application of Internet of Things and virtual reality technology in college physical education*. *IEEE Access*, 2020, PP(99):1-1, 10.1109/ACCESS.2020.2992283
- [3] B Zhou. *Smart Classroom and Multimedia Network Teaching Platform Application in College Physical Education Teaching*. *International Journal of Smart Home*, *IEEE Access*, 2016, 10(10):145-156, 10.1109/ACCESS.2020.2992283
- [4] Santosa, S., & Devi, A. D. (2021). *The Problematics Online Lectures on Human Resource Management Courses (HRM) at The Islamic College Level*. *Nazhruna: Jurnal Pendidikan Islam*, 4(2), 261-271, doi.org/10.31538/nzh.v4i2.1452
- [5] H Deng, J Wang. *Optimization of Computer-aided Teaching Network Management System for College Physical Education Courses*. *Computer-Aided Design and Applications*, 2020:158-167, doi.org/10.14733/cadaps.2021.S2. 158-167
- [6] X Shi, X Li, Y Wu. *The Application of Computer-aided Teaching and Mobile Internet Terminal in College Physical Education*. *Computer-Aided Design and Applications*, 2021, 18(S4):163-174, doi.org/10.14733/cadaps.2021.S4.163- 174
- [7] H Li, H Zhang, Y Zhao. *Design of Computer-aided Teaching Network Management System for College Physical Education*. *Computer-Aided Design and Applications*, 2021, 18(S4):152-162, doi.org/10.14733/cadaps.2021.S4. 152-162
- [8] Y Ding, N Zhang, Y Li. *College Physical Education Course Management System Based on Internet of Things*. *Mobile Information Systems*, 2021, 2021(2):1-10, doi.org/10.1155/2021/5874390
- [9] Ageed, Z. S., Zeebaree, S. R., Sadeeq, M. M., Kak, S. F., Rashid, Z. N., Salih, A. A., & Abdullah, W. M. (2021). *A survey of data mining implementation in smart city applications*. *Qubahan Academic Journal*, 1(2), 91-99, doi.org/10.48161/qaj.v1n2a52
- [10] Wang, Y., Muthu, B., & Sivaparthipan, C. B. (2021). *Internet of things driven physical activity recognition system for physical education*. *Microprocessors and Microsystems*, 81, 103723, doi.org/10.1016/j.micpro.2020.103723
- [11] Javanmardi, E., Liu, S., & Xie, N. (2020). *Exploring grey systems theory-based methods and applications in sustainability studies: A systematic review approach*. *Sustainability*, 12(11), 4437, doi.org/10.3390/su12114437
- [12] Ács, P., Betlehem, J., Oláh, A., Bergier, J., Melczer, C., Prémusz, V., & Makai, A. (2020). *Measurement of public health benefits of physical activity: Validity and reliability study of the International Physical Activity Questionnaire in Hungary*. *BMC Public Health*, 20(1), 1-10, doi.org/10.1186/s12889-020-08508-9
- [13] Papastergiou, M. (2010). *Enhancing physical education and sport science students' self-efficacy and attitudes regarding information and communication technologies through a computer literacy course*. *Computers & Education*, 54(1), 298-308, doi.org/10.1016/j.compedu.2009.08.015
- [14] Cholin, V. S. (2005). *Study of the application of information technology for effective access to resources in Indian university libraries*. *The International Information & Library Review*, 37(3), 189-197, doi.org/10.1016/j.iilr. 2005.07.002
- [15] Papastergiou, M. (2009). *Exploring the potential of computer and video games for health and physical education: A literature review*. *Computers & Education*, 53(3), 603-622, doi.org/10.1016/j.compedu.2009.04.001
- [16] Daum, D. N., & Buschner, C. (2012). *The status of high school online physical education in the United States*. *Journal of Teaching in Physical Education*, 31(1), 86-100, doi.org/10.1123/jtpe.31.1.86