

Multi-dimensional Path Analysis of Optimal Allocation of Basketball Curriculum Resources in Rural Schools from the Perspective of Educational Equity

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Abstract: *The optimal allocation of basketball curriculum resources in rural schools has a direct impact on promoting the balanced development of education. In order to promote the digital transformation of rural physical education, this paper puts forward a multi-dimensional path analysis of the optimal allocation of basketball curriculum resources in rural schools from the perspective of educational equity. Firstly, the paper defines the core concepts such as resource allocation, curriculum resources and classification of basketball curriculum resources are defined, and it is clear that basketball curriculum resources cover five dimensions: human resources, material resources, experience resources, knowledge resources and time resources. The paper deeply analyzes the necessity of optimizing the allocation of basketball curriculum resources from three aspects: realistic demand, internal demand and times demand, and points out that optimizing the allocation of resources can narrow the gap between urban and rural sports literacy, help rural education to revitalize and inherit sports culture, and at the same time promote the digital transformation of physical education and improve the ability of personalized training and tactical understanding. Aiming at the practical path of optimizing the allocation of basketball curriculum resources in rural schools, the paper puts forward multi-dimensional strategies. The research constructs the dual-track teacher training mode of "high-level talent introduction+internal self-optimization", a professional basketball teacher echelon is formed. Make a systematic teaching content resource system and strengthen supervision and implementation, and make full use of multimedia equipment and improve the special information resources of physical education classroom. The research aims to purpose is to promote the deepening of the fairness of physical education in urban and rural areas, and finally realize the coordinated development of students' physical literacy and rural education ecology.*

Keywords: *Educational equity; Country basketball; Curriculum resources; Optimize configuration; Strategic analysis*

1. Introduction

Basketball programs not only serve to enhance students' physical fitness and cultivate teamwork skills, but also act as a key vehicle for promoting the comprehensive development of young people. Constrained by factors such as the urban-rural dichotomy and regional economic disparities, basketball programs in rural schools have long been disadvantaged in terms of hardware facilities, teaching resources, and curriculum design^[1]. This situation has resulted in significant imbalances in opportunities for physical literacy development between urban and rural students. This structural imbalance not only hampers the individual growth of rural students but also impedes the overall improvement of physical education quality in China. Enhancing the quality of rural basketball instruction through optimized resource allocation has become a crucial breakthrough point for addressing educational equity challenges.

Numerous researchers have conducted in-depth analyses on teaching resource allocation. Some scholars propose constructing an indicator model encompassing dimensions like venue facilities, teacher proficiency, and curriculum development to reveal resource gaps in rural basketball education. Others suggest innovative approaches such as establishing digital resource-sharing platforms to enhance curriculum resource utilization through technological means^[2]. However, existing resource

allocation strategies often focus on isolated elements, lack systematic integration, and overlook the need for innovative integration of rural cultural characteristics with basketball education.

Based on the analysis of the current situation of basketball learning in rural areas, this paper puts forward a specific multi-dimensional path of curriculum resource allocation to help build a fairer and higher-quality physical education system.

2. Definition of related concepts

2.1 Resource allocation

Defining resource allocation first requires understanding “resources.” Resources typically refer to natural resources that can be utilized for human life and production. Furthermore, with the advancement of human civilization, the concept has expanded to encompass numerous fields such as socio-economics, financial resources, and material resources^[3]. Thus, anything used to satisfy human life and production qualifies as a resource. Beyond natural resources, this concept encompasses processed materials, as well as the technologies, information, and labor required for production. Resource allocation primarily involves distributing resources in a scientific way to maximize output. For instance, the subject of resource allocation allocating finite human, material, and other resources to achieve peak productivity.

The so-called allocation of teaching resources mainly means that local government departments or relevant educational units use different methods and procedures to allocate the existing limited teaching resources such as financial resources, material resources and manpower, and allocate these limited teaching resources to various schools in a reasonable manner in order to obtain better school-running benefits. The core problem of teaching resource allocation is how to allocate resources more reasonably and make them play a big role.

2.2 Curriculum resources

Curriculum resources refer to all tangible and intangible elements that may enter into curriculum activities, directly become curriculum content, or support the implementation of curriculum activities^[4]. Therefore, curriculum resources can be viewed as the aggregate of all human, material, and natural resources available throughout the entire curriculum development process, including curriculum design, implementation, and evaluation. Some scholars further define curriculum resources as the collective term for conditions possessing educational value that can be transformed into school curricula or serve school curricula^[5]. Numerous definitions of curriculum resources exist in academic circles, and no unified concept has yet been established. However, most scholars agree that curriculum resources can be categorized broadly and narrowly. Broadly defined, curriculum resources encompass all factors conducive to achieving curriculum objectives, while narrowly defined, they refer specifically to the direct sources of factors that form curriculum objectives. For the purposes of this paper, basketball curriculum resources are defined as all factors that may enter basketball curriculum activities and contribute to the realization of basketball curriculum objectives.

2.3 Classification of basketball curriculum resources

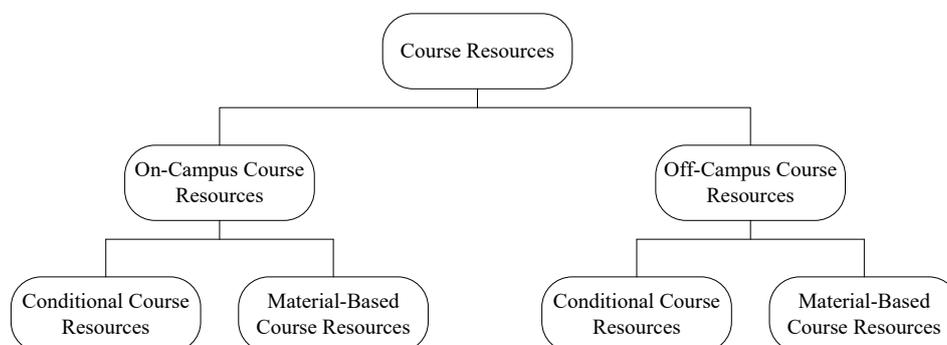


Figure 1 Schematic Diagram of Course Resource Classification

Curriculum resources can be functionally divided into conditional curriculum resources and

material curriculum resources. Material curriculum resources refer to those that act on the curriculum and can become the material or source of the curriculum^[6]. Conditional curriculum resources act on the curriculum but are not the direct source of the curriculum itself, but they largely determine the scope and level of curriculum implementation. Curriculum resources can be divided into on-campus curriculum resources and off-campus curriculum resources in terms of space distribution. The relationship between on-campus curriculum resources and off-campus curriculum resources as well as material curriculum resources and conditional curriculum resources is shown in Figure 1.

The classification of basketball curriculum resources is based on grouping resources with similar characteristics together, then distinguishing them according to their specific attributes^[7]. There is no universal standard for categorizing basketball curriculum resources in academia; classifications are determined by researchers' specific needs for analysis and problem-solving. Furthermore, overlap or intersection often exists between different categories of basketball curriculum resources. Generally, academic circles categorize basketball curriculum resources are categorized into several types: human resources, basketball facility resources, basketball curriculum knowledge and skill resources, extracurricular and off-campus sports resources, natural geographic curriculum resources, and information resources. For this study, basketball curriculum resources are broadly classified into the following five categories: the research team broadly classifies basketball curriculum human resources, basketball curriculum material resources, basketball curriculum experiential resources, basketball curriculum knowledge resources, and basketball curriculum time resources.

3. The necessity of optimizing the allocation of basketball curriculum resources in rural schools from the perspective of educational equity

3.1 To promote the balanced development of urban and rural students' sports literacy needs

At present, there are still structural differences between urban and rural students in sports literacy development opportunities, and basketball course, as an important carrier of physical education, has a direct impact on the balanced improvement of students' sports literacy. Rural schools are limited by the lack of standardization of venues and facilities, and the lag of equipment renewal^[8]. Rural students find it difficult for students to engage in systematic and scientific basketball training, which leads to a gap between rural students and urban students in the mastery level of sports skills and urban students. The optimization of the allocation of basketball curriculum resources can create the same skills learning conditions for rural students as those for urban students through standardized venue construction and hierarchical equipment allocation. At the same time, the introduction of digital teaching resources can break through the geographical restrictions, enable rural students to share high-quality basketball teaching cases and training methods, and promote the synchronous development of urban and rural students' sports cognitive ability^[9]. Educational departments can improve the teaching design level of rural basketball course by allocating professional teachers or carrying out joint teaching and research between urban and rural teachers, the teaching design level of rural basketball course can be improved, and students can be ensured to get comprehensive guidance in skills learning and rule cognition, and finally the balanced development of urban and rural students' sports literacy can be realized.

Table 1 Statistics on Professional Gymnastics Instructors in Higher Education Institutions

Type of Institution	Number of Professional Gymnastics Instructors	Percentage of Total Physical Education Teachers	Number of Teachers with Senior Professional Titles	Number of Newly Recruited Teachers in the Past Five Years
Comprehensive University	twelve	8%	three	2
Teacher Training College	25	15%	eight	three
Sports College	sixty-eight	35%	22	eight
Science and Engineering College	five	3%	one	0

3.2 To promote the revitalization of rural education and the inherent requirements of sports culture inheritance

Rural education revitalization serves as a crucial pillar of the rural revitalization strategy, with physical education playing a vital role in enhancing students' physical fitness, fostering team spirit, and preserving local cultural heritage. Basketball, characterized by its strong emphasis on teamwork and broad grassroots appeal, demonstrates unique cultural adaptability in rural areas. The optimization of

basketball curriculum resources can deeply integrate the sport with rural cultural elements, enabling the development of locally distinctive school-based programs^[10]. Furthermore, the promotion of basketball participation can engage parents and communities in school education, fostering a collaborative “home-school-community” educational mechanism that injects social momentum into rural education revitalization. This model of cultural transmission and educational revitalization through sports aligns with the overarching goals of the rural revitalization strategy while offering new pathways for the sustainable development of rural schools.

3.3 Response to the needs of the times of national policy orientation and educational modernization transformation

In recent years, the state has issued a number of policies to promote the fair development of physical education. The optimal allocation of basketball curriculum resources is the concrete practice of educational departments and schools in implementing these policies^[11]. The government and educational departments can systematically improve the conditions of rural basketball education and ensure that the policy dividend accurately benefits rural students. For example, in some areas, through the "Urban-Rural School Sports Facilities Sharing Plan", the idle equipment of urban schools is allocated to the countryside, or enterprises are introduced to donate to build multi-functional basketball courts, which all reflect the resource optimization path under the policy guidance.

From the perspective of educational modernization, the optimal allocation of basketball curriculum resources is an important starting point to promote the digital transformation of rural physical education. By configuring smart wearable devices, sports monitoring systems and other scientific and technological tools, students' sports data can be collected and analyzed in real time, which provides a basis for physical education teachers to make personalized training programs. Physical education teachers can use virtual reality technology to simulate the game scene can improve the tactical understanding ability of rural students.

4. Multi-dimensional path of optimizing the allocation of basketball curriculum resources in rural schools from the perspective of educational equity

4.1 Expanding the base of basketball teachers and improving the quality of basketball teachers

Local education authorities have refined campus basketball management mechanisms, intensified efforts to recruit high-level basketball specialists, and evenly distributed existing basketball teachers across rural schools^[12]. Through weekly teaching research activities, basketball teachers train their fellow physical education instructors in fundamental basketball course instruction, thereby expanding the basketball teaching workforce in rural areas. Local education authorities hold basketball teaching experience sharing sessions are held within the city to provide physical education teachers in rural schools with learning opportunities for basketball course instruction. Building upon this foundation, a research funding support mechanism will be established to stimulate physical education teachers' enthusiasm for research. The mechanism leveraging the mentorship of experienced teachers will accelerate the professional growth of younger educators in basketball instruction, thereby establishing a robust teacher pipeline for school basketball programs. The resulting basketball teaching structure is illustrated in Table 2.

Table2 Basketball course teacher structure

Hierarchy	Indicators	Specific Figures
Talent Recruitment	Specialized Recruitment of High-Level Talent	5 individuals (1 from each key urban school assigned to rural areas)
Balanced Allocation	Current Base of Basketball Teachers	40 individuals (previously 2 per school on average → 1-3 per school after balancing)
Faculty Expansion	Basketball Training Coverage Rate for Physical Education Teachers	100% (full participation of all 200 physical education teachers in rural areas)
Teaching and Research Activities	Annual Average Number of Teaching Research Activities	40 sessions per school (1 session per week × 40 weeks)
Experience Sharing	Participation Rate in Municipal Teaching Sharing Sessions	85% (170 person-times per year for rural physical education teachers)
Research Incentives	Annual Average Number of Approved Research Projects	10 items (jointly applied for by urban districts and rural schools)
Team Development	Achievement Rate for Young Teachers' Professional Development	90% (all newly hired rural teachers meet standards within 3 years)
Overall Faculty Ratio	Proportion of Specialized Basketball Teachers	20% (45 out of 220 physical education teachers in rural areas)

Schools and education departments should be far-sighted to train existing teachers in basketball special basic teaching, improve teachers' teaching level, and make existing sports talents grow up

rapidly in basketball teaching. Education departments should establish and improve the system and mechanism of talent introduction, increase welfare benefits, introduce high-level basketball talents to rural schools, and guide rural schools to make good use of high-level basketball teaching talents.

On the human resources of basketball course teaching, rural education departments can optimize basketball teachers by "self-optimization" within the local physical education teachers and introducing high-level basketball talents^[13]. The internal self-optimization of physical education teachers can improve the basketball classroom teaching level of rural physical education teachers by holding a sharing exchange meeting of basketball teaching experience in the city and training rural physical education teachers with excellent junior and senior high school basketball teachers. We can also improve the basketball teaching level of physical education teachers while expanding the base of basketball teachers by organizing regular basketball games for physical education teachers. The introduction of high-level talents is to improve the teaching quality of basketball teachers while expanding the team of basketball teachers in rural schools.

4.2 Develop basketball teaching content resource system and supervise the implementation

Education authorities should uniformly deploy teaching content resources for rural schools based on national basketball curriculum guidelines and local school conditions of rural areas^[14]. Education authorities consolidating feedback from physical education teachers on curriculum development, they should establish a basketball teaching content framework and detailed implementation rules. Timely procurement of basketball textbooks, audiovisual materials, and videos is essential to address the lack of teaching resources in rural basketball programs.

On this foundation, education authorities establish a robust basketball curriculum management mechanism to clarify the responsibilities of all levels of educational departments and rural schools. Responsible personnel at each level conduct random inspections of textbook selection, teaching content choices, understanding of teaching objectives, basketball competitions, and facility construction for rural basketball courses, providing timely feedback to schools for rectification and implementation. Education authorities include rural schools that fail to implement measures adequately should be included in year-end evaluations, with relevant school leadership held accountable. Education authorities guide rural schools to select high-quality national rural basketball teaching materials through multiple channels. Only through systematic instructional guidance from education departments combined with teachers' tireless efforts can the quality of basketball course instruction be significantly enhanced with minimal effort.

The choice of teaching content should be balanced, the national curriculum should be combined with local reality to choose teaching content, and reasonable teaching time should be arranged for different teaching content according to students' mastery of basketball teaching content, especially on the basis of grasping basic skills, more efforts should be made for difficult skills. Rural schools should improve the effective connection between the teaching content of rural basketball course and the content of extracurricular basketball activities. Rural schools also necessary to build a platform for basketball competition, make full use of the competition platform to show the achievements of basketball classroom teaching and training, and use the provided competition resources to improve students' basketball competitive level and improve the teaching content system of basketball courses.

4.3 Make full use of multimedia equipment and improve the special information resources for physical education classes

In basketball teaching, physical education teachers in rural schools should make full use of the existing multimedia information technology equipment resources in the classroom, teachers first play the videos of classroom teaching content, make students have a general understanding of what they are teaching, then go to the basketball court for practical teaching, and finally use the multimedia equipment in the classroom again, so that students can deepen their memory of technical actions. Physical education teachers should actively develop and utilize the existing information technology equipment resources in rural schools. Mobile phones should be fully used in physical education classroom teaching. By downloading videos related to teaching content on mobile phones, students can watch teaching videos in groups in classroom teaching, and the video recording function on mobile phones can also be used to correct students' wrong actions in the learning process. Physical education teachers should make full use of the function of mobile phone to solve the situation of insufficient information resources in basketball classroom teaching in rural schools.

The school, together with the government, will gradually optimize the special information technology equipment for PE class, and purchase the movable flat panel display and drawing for PE class, which will increase students' learning efficiency and understanding of technical action essentials when applied in basketball class^[15]. Using advanced information technology and equipment to improve the efficiency of physical education classroom teaching. Schools should also collect and reserve basketball teaching policy documents, video materials, newspapers and magazines, basketball books, multimedia technology, network equipment and other resources in time. On the existing basis, schools make use of information platforms such as WeChat, Weibo, Tik Tok and Aauto Quicker to learn, and at the same time publicize the teaching of basketball courses in schools, so as to facilitate information sharing among schools.

5. Conclusion

From the perspective of educational equity, this study systematically analyzes the multi-dimensional path of optimal allocation of basketball curriculum resources in rural schools. The core contribution of the research is to break through the single-dimensional limitation of traditional resource optimization research, apply the theoretical system of educational equity to the field of rural basketball courses for the first time, and put forward the dual-track strategy of "differentiated configuration+precise supply", which not only emphasizes the standardization construction of hardware resources, but also pays attention to the cultural adaptation development of software resources, and also pays attention to the integration of digital technology to realize the leap of resource utilization efficiency.

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