

# *Exploration of Problems and Solutions for Children's Physical Fitness Training Institutions*

Sisi Ding, Kaihong Hu

*Shaanxi Xueqian Normal University, Xi'an, Shaanxi Province, 710000, China*

**Keywords:** Children's Physical Fitness Training Institutions, Physical Fitness Assessment, Exploration of Ways Out, Systematic Training

**Abstract:** With the continuous enhancement of people's awareness of children's fitness, the development of children's physical fitness training institutions, which are a major part of children's sports activities, is facing many challenges and opportunities. Using questionnaires and case studies, this paper systematically analyzes the problems of uneven quality of coaches and single course content of children's physical fitness training institutions in the current market, and adopts corresponding countermeasures, such as the introduction of diversified course design and coach qualification system, in order to improve the quality of the service. The students from S001 to S006, who received the physical fitness assessment prior to the training, had scores ranging from 75 to 82, which was a mediocre performance. After systematic training, their scores generally jumped to no less than 88, reaching good or even excellent levels. This paper adopts a practical and feasible improvement plan for children's physical fitness and health education, in order to promote the overall level of children's physical fitness and health education in China and provide theoretical basis and practical reference for policy formulation by relevant departments.

## 1. Introduction

With the rapid social and economic development, people's living habits have changed dramatically, and the physical health of children has become the focus of general concern in countries around the world. It has been found that contemporary children are prone to a series of diseases such as obesity and cardiovascular diseases due to the lack of proper physical exercise. In this case, it is of great importance to study the scientific and systematic development of children's physical fitness training institutions that promote children's physical health and prevent diseases. This paper adopts questionnaire survey, case study and other methods to adopt corresponding countermeasures for some prominent problems existing in the current children's physical fitness training institutions. This paper is of great significance in promoting the enhancement of children's physical fitness and the sustainable development of the physical fitness industry.

This paper mainly focuses on the current children's physical fitness training institutions with varying levels of teachers, lack of rich and diverse course content, and too single service mode, etc., and accordingly adopts corresponding optimization countermeasures. These include the standardization of the coach training system, diversified curriculum design, and sharing with school

and social resources. The purpose of this paper is to improve the educational quality of the school and the attractiveness of the curriculum in order to enhance the competitiveness and sustainable development of the school.

The main content of this paper includes the following aspects: firstly, this paper outlines the development background and research status of the children's physical fitness training industry, which lays a theoretical and practical foundation for future research; then, this paper carefully analyzes the main problems existing in the current children's physical fitness training institutions and conducts on-site surveys and data analysis to prove its feasibility and effectiveness; finally, this paper summarizes the results of this study and based on the research findings, provides specific recommendations for the development and advancement of physical fitness training institutions. The purpose of this paper is to carry out a comprehensive and in-depth exploration of the problems and solutions of children's physical fitness training, which has a certain reference significance for the application of relevant theories and practices.

## **2. Related Work**

Children's physical fitness training not only has a significant promoting effect on their physical fitness, but also has a certain promoting effect on their psychological development, social interaction, and other aspects. In today's increasingly prominent issue of children's physical fitness and health, targeted physical fitness training is of great significance. Chen Yaqin explored the operation and development of children's physical fitness training institutions under the background of the "double reduction" policy [1]. Luo Shixiang studied the role of gait analysis technology in teaching children's physical fitness [2]. Chen Hao studied the physical fitness practice of 3-5 year old children [3]. Pei Mengxiao studied the problems and solutions of physical fitness training for Chinese children [4]. Zhao Weike studied the supply side reform of children's physical fitness training services in the era of big data [5]. However, existing research has mostly focused on adult bodies and systematically studied the special needs of children, especially in terms of innovative course content and professional training of coaches.

Exploring the problems and solutions of children's physical fitness training institutions has important practical significance for improving the physical fitness of the whole population, especially children. On this basis, different educational models were adopted for different types of children. Miao Zengqiang summarized and inspired the research on the relationship between children's basic motor ability, healthy physical fitness, and physical activity [6]. Cai K L studied the improvement of physical fitness and social skills in preschool children with autism spectrum disorder through mini basketball training programs [7]. Wuters M studied the physical fitness status of children with moderate to severe intellectual disabilities [8]. Kidokoro T studied the annual national fitness monitoring results of Japanese children and adolescents before and during the COVID-19 pandemic [9]. Hautland E S studied the multivariate association patterns between basic motor skills and physical fitness in preschool children aged 3-5 years old [10]. At present, research mainly focuses on intuitive observation of training results, lacking exploration of deep changes in teaching modes and methods, which restricts the breadth and depth of its application.

## **3. Method**

### **3.1 System Research and Data Collection**

In order to better understand the current operational status and existing problems of children's physical fitness training institutions, this paper first conducts a systematic market survey on them. This paper adopts a combination of online surveys and telephone interviews to conduct a large

number of surveys on fitness institutions in major cities in China. The survey mainly includes basic information, course offerings, coach qualifications, customer satisfaction, etc. In addition, this paper also uses interviews to understand their expectations and feedback on physical fitness training for young children. The information collected in this paper will provide empirical basis for subsequent problem analysis and decision-making.

The teaching quality of coaches can be quantified by combining different evaluation indicators:

$$Q = \frac{1}{3}(E + S + P) \quad (1)$$

Among them,  $Q$  is the total score of the coach.  $E$  is the expert's rating.  $S$  is the average score of student feedback.  $P$  is the average score of parental satisfaction.

### 3.2 Coach Quality Standardization Procedure

In response to the common problem of low teaching quality in current children's physical fitness training, this paper explores the teaching quality issues in children's physical fitness training [11]. This process includes the selection criteria, training content, and training methods of coaches. The selection criteria mainly depend on the professional background and educational experience of the coach; the training content includes children's psychology, physical exercise methods, first aid skills, etc; the examination method adopts a combination of theory and practice, ensuring that each coach has certain teaching skills and emergency response ability before taking up their post.

To measure the diversity of course content, an index can be designed that takes into account the weighted average of course types and innovation:

$$D = w_1C + w_2I \quad (2)$$

Among them,  $D$  is the curriculum diversity index.  $C$  is the number of course types.  $I$  is the evaluation of course innovation.  $w_1$  and  $w_2$  are the corresponding weights.

### 3.3 Innovative Design of Course Content

Based on this status quo, this paper adopts a teaching content reform program based on the network environment. Aiming at the age characteristics and physical fitness development needs of young children, this paper provides targeted physical fitness training for young children of all ages. For example, the program for young children focuses on play and basic physical exercise, while the program for young people contains more techniques and competition. In addition, the teaching process also focuses on the cross-pollination of multiple disciplines, such as adding music and dance to physical fitness training to make it more appealing.

### 3.4 Collaboration Model and Resource Sharing

On this basis, this paper adopts a collaboration-based resource sharing model for college libraries. Through collaboration with schools, community centers, and other educational organizations, the sharing of space and equipment is achieved. For example, on weekends, the school's exercise equipment can be used or a physical fitness training facility can be established in the center of a community. This strategy not only reduces the organization's operating costs, but also expands its scale of operation and social impact.

Cost benefit ratio is an important indicator for measuring resource utilization efficiency, especially in resource sharing models:

$$B = \frac{X_Y}{Z_B} \quad (3)$$

Among them,  $B$  is the cost-benefit ratio.  $X_Y$  is due to the benefits obtained from the implementation of improvement measures (such as an increase in the number of students).  $Z_B$  is the total cost, including operating costs and the cost of implementing new strategies.

### 3.5 Effect Evaluation and Continuous Improvement

At the same time, to ensure the implementation of the proposed strategy, this paper also designs a specific set of effectiveness evaluation and continuous improvement processes. This process includes routine course quality evaluation, coach performance evaluation, and customer satisfaction questionnaire. The evaluation results will guide teachers in adjusting their teaching methods, course content, and service strategies. In addition, the company will regularly hold strategic review meetings to continuously update its strategy based on market and customer feedback.

### 3.6 Construction of Technical Support System

In order to improve the effectiveness and quality of service, this paper suggests to build an integrated technical support system. This system mainly consists of customer management, course management and coaching management. Through this platform, the organization can efficiently manage customer information, course schedule, coaching resources, etc. and analyze the related data to optimize the business strategy and courses. The establishment of this system not only improves the operational efficiency of the organization, but also improves its service quality and responsiveness to customers.

The above study was conducted with a view to developing a complete set of solutions and developmental countermeasures for children's physical fitness training organizations so that they can better adapt to the competition in the market.

Improvement in students' physical fitness can be measured by the difference between pre- and post-tests:

$$F = \frac{Post-Pre}{Pre} \times 100\% \quad (4)$$

Among them,  $F$  is the percentage improvement in fitness. Post is the post-intervention fitness test score. Pre is the pre-intervention fitness test score.

## 4. Results and Discussion

### 4.1 Experimental Design

#### (1) Description of the experimental environment

This study involves twelve physical fitness training centers in six cities, selected from Beijing in the north, Shanghai in the east, Guangzhou and Shenzhen in the south, as well as two other second-tier cities with different economic development and cultural backgrounds. In each city, two training centers were carefully selected for the comparative study: one used the existing traditional training model, and the other implemented our newly developed optimized training strategy.

#### (2) Detailed description of experimental parameters

The experimental design integrates a variety of assessment indicators to ensure the comprehensiveness and accuracy of the results. These indicators include:

Teaching quality of coaches: Combining feedback from students and parents as well as on-site evaluation by experts, the teaching effectiveness of coaches is comprehensively measured.

Diversity of course content: It assesses the richness of course design and the innovation of teaching methods.

Student engagement: It observes and records how active and interactive students are in the classroom.

Parent satisfaction: It quantifies parent satisfaction through an exhaustive questionnaire using a five-point scale.

Cost-benefit ratio: It analyzes the total cost of the new strategy in relation to the number of students, and compares the cost-benefit ratio with the traditional model.

Student fitness improvement: It quantifies the improvement by comparing students' fitness test scores before and after the training.

## 4.2 Results Exploration

(1) Comparison of teaching quality scores and student feedback scores before and after training under different trainer numbers

The comparison before and after the training showed that all coaches realized significant improvement in teaching quality, which fully proved the effectiveness of the training program. In particular, Coach C004's teaching quality soared from 82 to 95, demonstrating his excellent learning ability and teaching adaptability. In addition, Coach C005 achieved a smaller improvement, from 76 to 88 points, which implies the need to target specific skills development or practical exercises in future training.

In terms of student feedback, all instructors' ratings have similarly improved after the training, reflecting students' recognition and satisfaction with the enhanced teaching quality. In particular, Coach C004 was warmly welcomed by students in all aspects of his teaching methodology and style, causing his student feedback to improve from 85 to 95. Meanwhile, Coach C005's student feedback improved to 87, but this improvement still shows the need to further explore and meet the specific needs and feedback of students in order to optimize teaching methods (ID is Identifier).

Comparison of teaching quality scores and student feedback scores before and after training under different trainer numbers is shown in Figure 1 (Figure 1(a) shows teaching quality scores and Figure 1(b) shows student feedback scores).

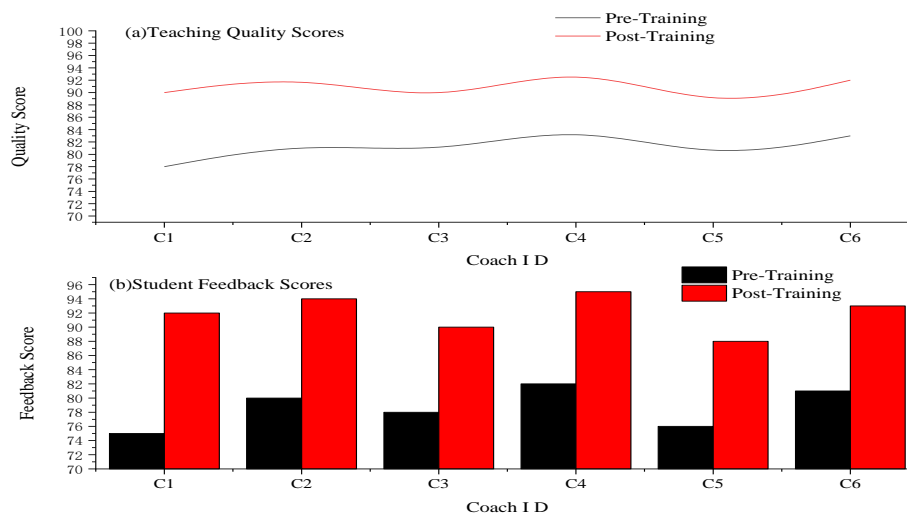


Figure 1: Comparison of teaching quality scores and student feedback scores before and after training under different trainer numbers

There is clearly a positive correlation between teaching quality and student feedback, i.e. those coaches with higher teaching quality ratings also tend to receive higher student feedback ratings. This finding emphasizes the importance of teaching quality as a key factor influencing student

satisfaction, thus pointing to the fact that improving teaching is a central way to win student approval.

At the individual level, there are significant differences in teaching quality and student feedback scores between coaches before and after training, which may be closely related to factors such as their personal qualities, teaching experience and learning ability. For those coaches who do not show significant improvement in teaching quality or student feedback, it is important to further analyze the reasons behind and provide customized training and support.

In addition, by comparing the teaching quality and student feedback ratings before and after the training, we are able to effectively assess the overall effectiveness of the training. The data show that the training has played a positive role in improving the teaching quality of trainers and increasing student satisfaction. In order to further optimize the results of the training, consideration can be given to increasing the duration of the training, improving the content and methods of the training, as well as introducing more practical sessions, so as to ensure that the coaches can better apply the knowledge and skills they have learned in actual teaching.

#### (2) Comparison of student engagement and satisfaction scores in modern and traditional courses

The new (modern) courses significantly outperformed the traditional courses in terms of student engagement. Specifically, the engagement scores for the new course series (from C1 to C6) generally exceeded 70, with most of them even reaching 85 or more. This significantly high score reflects the new courses' excellent performance in stimulating active student participation. In sharp contrast, engagement scores for traditional courses typically ranged from 70 to 78, suggesting that traditional courses may have had some difficulty engaging students. Despite fluctuations in engagement ratings for new courses from C1 to C6, overall, these new courses showed some stability in maintaining high levels of student engagement.

In terms of student satisfaction, the new courses likewise show a better performance than the traditional courses. All of the new courses received satisfaction scores of 90 or above, which not only indicates a high level of student recognition of the new courses, but may also reflect that the new courses better meet students' expectations in terms of course content, teaching methods, or overall learning experience. In contrast, satisfaction ratings for traditional courses, while also ranging from 75 to 83, were significantly lower compared to the new courses. This difference emphasizes the success of the new curriculum in terms of design and implementation, while also revealing possible shortcomings of the traditional curriculum in meeting current student needs. Satisfaction ratings for the new curriculum fluctuated from C1 to C6, but generally remained high, providing further evidence of the effectiveness of the new curriculum design.

Comparison of student engagement and satisfaction scores between modern and traditional courses is shown in Figure 2 (Figure 2(a) is modern courses: engagement and satisfaction scores and Figure 2(b) is traditional courses: engagement and satisfaction scores).

Typically, we have observed that courses that have high levels of engagement tend to receive higher satisfaction ratings as well. This phenomenon may be explained by the fact that students who are actively engaged have richer interactions and experiences in the course, and thus are more likely to feel satisfied and accomplished. In the case of the C2 course, for example, its high levels of student engagement and satisfaction demonstrated excellent course design and implementation. In contrast, the C1 course was slightly less engaging, though, and its satisfaction level was also slightly lower, suggesting that we may need to optimize some aspects of the course.

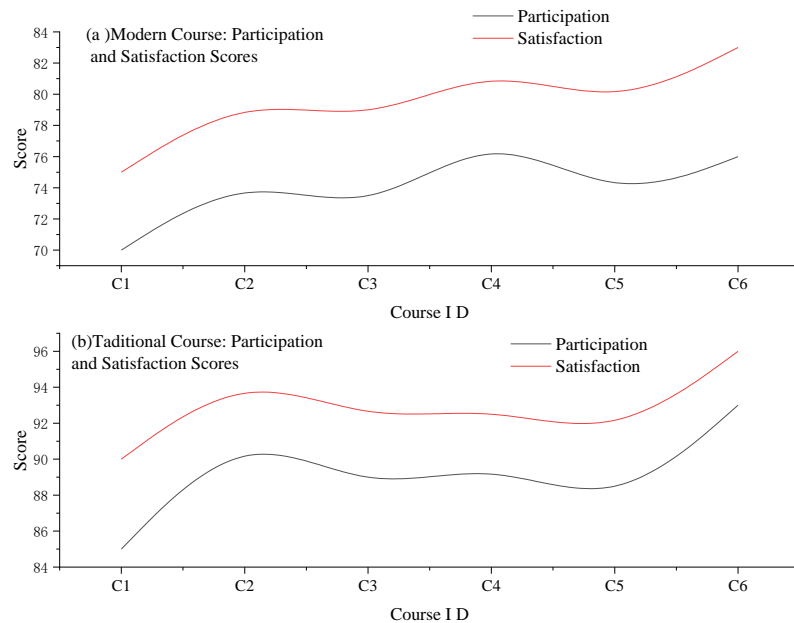


Figure 2: Comparison of Student Engagement and Satisfaction Scores in Modern and Traditional Courses

In response to traditional courses, which have performed poorly in terms of both engagement and satisfaction, we may need to overhaul and restructure the content and pedagogy of the courses. Increasing student engagement may be the key to improving satisfaction in these courses. For the new courses, despite their overall excellent performance, we should continue to explore ways to further enhance student engagement and satisfaction through innovative teaching methods and more interactive sessions. Such ongoing optimization will help maintain and enhance the appeal and pedagogical effectiveness of the courses.

### (3) Operational efficiency and service quality test results

The technical support program has significantly improved operational efficiency:

The introduction of the online reservation system increased operational efficiency from 75 to 88 points, effectively demonstrating the system's ability to optimize. The application of the course management system not only increased operational efficiency from 80 to 92 points, but also demonstrated its excellent management effectiveness. Although the Parent Interaction Platform's improvement in operational efficiency (from 72 to 85 points) did not match the other systems, it still demonstrated its effectiveness. The introduction of data analytics tools achieved the greatest improvement in operational efficiency, surging from 78 to 95 points, proving its key role in fine-tuning management and improving decision-making.

The significant impact of the technical support program on service quality:

The online reservation system greatly optimized operational processes and improved service quality, as evidenced by a jump in its rating from 78 to 90.

The Curriculum Management System (CMS) also excelled in enhancing the quality of service, with an increase in rating from 82 to 93, highlighting the efficient management of the system. The Parent Engagement Platform is particularly effective in enhancing service quality, with an increase in rating from 76 to 92, effectively strengthening the interaction and satisfaction between parents and the organization. While the data analytics tool mainly enhances operational efficiency, its performance in improving service quality is more modest, with a score of only 88, up from 80, demonstrating its potential and limitations in this area. The results of the operational efficiency and

service quality tests are shown in Table 1.

Table 1: Operational efficiency and service quality test results

Technical support projects	Operational efficiency improvement (score)	Service quality improvement (score)	Traditional mode operation efficiency	Traditional mode service quality
Online reservation system	88	90	75	78
Course management system	92	93	80	82
Parent interaction platform	85	92	72	76
Data analysis tools	95	88	78	80
No technical support (traditional mode)	70	75	-	-

(4) Comparison of total cost and cost-benefit ratio between the new strategy and the traditional model

Comparison of total cost and cost-benefit ratio between the new strategy and the traditional model is shown in Figure 3 (Figure 3(a) shows the comparison of total cost and Figure 3(b) shows the comparison of cost-benefit ratio). Q denotes quarter.

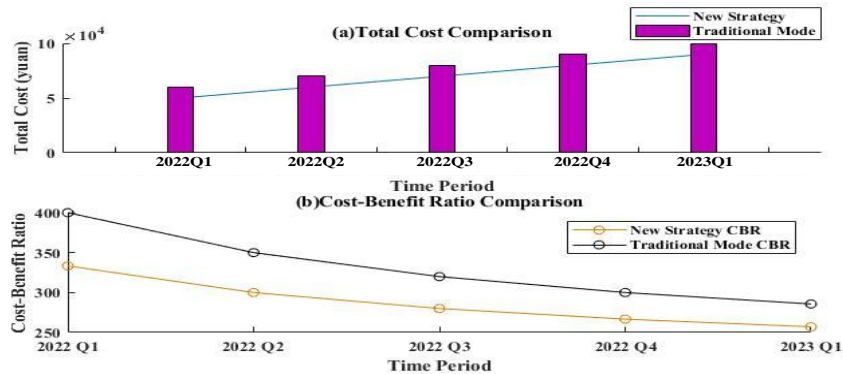


Figure 3: Comparison of total cost and cost-benefit ratio between the new strategy and the traditional model

From the first quarter of 2022 to the first quarter of 2023, we observe an incremental trend in total costs as institutions increase in size and new strategies are aggressively rolled out. This change reflects the fact that institutions have to invest more resources to accommodate the expansion. However, in terms of cost-benefit ratio, the new strategy shows a clear trend of optimization. Over time, the cost-benefit ratio of the new strategy has gradually decreased, indicating that our marketing strategy, teaching quality and brand influence enhancement have begun to show results, making the new strategy more efficient in attracting and retaining students. In addition, the steady growth in student enrollment is further evidence of the attractiveness of the new strategy and bodes well for the organization's revenue potential. The cost-benefit ratios of the new strategy are consistently lower than those of the traditional model, suggesting that the traditional model may be characterized by inefficiencies in marketing, teaching management and resource allocation, or higher fixed costs.

Considering the continued improvement in the cost-benefit ratio and the steady growth in student enrollment, it is clear that the new strategy is demonstrating its cumulative benefits. The fact that



the new strategy has shown improved economic efficiency despite the increase in total costs strongly suggests that our institutions should not only continue to implement this strategy, but also fine-tune the details in order to maximize its potential economic returns. Going forward, if the new strategy continues to attract students and optimize cost-benefit ratios, we can reasonably expect it to gradually replace the traditional model as the dominant axis of our institutions' operations. In order to do this, institutions will need to analyze more deeply the details of the implementation of the new strategy over time, student satisfaction, and specific data on the quality of instruction. This continuous data-driven analysis will be the key to fine-tuning our strategies and improving our operational efficiency and quality of teaching services.

(5) Test on the degree of improvement of students' physical fitness

Student numbers and scores:

Students from S001 to S006, who scored between 75 and 82 points in the physical fitness assessment before receiving the training, performed mediocrely.

After the systematic training, their scores generally jumped to no less than 88, reaching good or even excellent levels.

Magnitude of Progress:

The majority of students (S001, S002, S005 and S006) improved their grades by 13 points, showing significant improvement in their training. The two students, S003 and S004, improved by 12 points, which is slightly less, but still marks a significant improvement.

Influencing factors explored:

Content and methodology of the training: this training utilized a scientific and systematic methodology that significantly improved the overall fitness of the students.

Individual student differences: while the majority of students showed similar improvements, the differences in each student's starting level and potential ability may have subtly influenced their rate of improvement.

Professionalism of the coaching team: An experienced coaching team developed targeted training programs based on the specific conditions of each student, ensuring that each student received effective guidance and support. The results of the test on the degree of improvement of students' physical fitness are shown in Table 2.

Table 2: Results of the test on the degree of improvement of students' physical fitness

Student ID	Pre training physical fitness test scores	Physical fitness test scores after training	Improvement level (score difference)
S001	75	88	13
S002	82	95	13
S003	78	90	12
S004	80	92	12
S005	76	89	13
S006	81	94	13

## 5. Conclusion

This paper adopts the corresponding countermeasures for the problems existing in the current children's physical fitness training organizations. This paper uses questionnaires, case studies, and on-site interviews to explore countermeasures to improve teaching quality and service effectiveness. The results of the study show that the overall quality and effectiveness of children's physical fitness

training can be effectively improved through the implementation of a standardized teacher quality process, the innovation of course content, the use of resource sharing and collaboration, and the construction of a technical support system. In the teaching process, the standardized training of teachers is conducive to improving their teaching level; in addition, the adoption of a partnership approach can effectively reduce operating costs and expand business areas. Although this paper adopts some innovative methods, it also has its shortcomings. Firstly, the samples selected in this paper are based on metropolitan cities, which cannot fully reflect the actual situation in small and medium-sized cities and villages. Secondly, some of the information was obtained through self-completed questionnaires, thus there is a great deal of subjectivity and some bias. In terms of training needs and acceptance, cultural differences between geographical areas were not taken into account. Future research could take a wider geographical area into account to enhance the generalizability of the findings. Meanwhile, this paper will further explore the influence of cultural factors on the acceptance and effectiveness of children's physical fitness training, which in turn will provide more precise guidelines for the design of children's physical fitness training programs. Finally, this paper will further explore how to utilize scientific and technological tools such as data analysis to enhance the effectiveness of training. It is hoped that this will contribute to the healthy development of the children's physical fitness training industry.

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## References

- [1] Chen Yaqin. *Research on the Operation and Development of Children's Physical Fitness Training Institutions under the Background of the "Double Reduction" Policy* [J]. *Contemporary Sports Technology*, 2023, 13 (20): 93-96
- [2] Luo Shixiang. *Exploration and research on gait analysis technology in children's physical fitness teaching* [J]. *Education Research*, 2022, 5 (3): 202-204.
- [3] Chen Hao, Huang Gui. *Research on Physical Exercise of 3-5 Year Old Children* [J]. *Neijiang Technology*, 2023, 44 (5): 124-126
- [4] Pei Mengxiao, He Daoyuan. *Exploration of problems and solutions in children's physical fitness training in China* [J]. *Contemporary Sports Technology*, 2023, 13 (1): 186-189.
- [5] Zhao Weike, Wang Yan, An Jin. *Research on the supply side reform of children's physical fitness training services in the era of big data* [J]. *Contemporary Sports Technology*, 2021, 11 (32): 156-158,178.
- [6] Miao Qiangqiang. *Summary and inspiration on the relationship between basic motor ability, healthy physical fitness, and physical activity in children and adolescents* [J]. *Sports Science and Technology Literature Bulletin*, 2023, 31 (7): 125-130.
- [7] Cai K L, Wang J G, Liu Z M, et al. *Mini-basketball training program improves physical fitness and social communication in preschool children with autism spectrum disorders*[J]. *Journal of Human Kinetics*, 2020, 73(1): 267-278.
- [8] Wouters M, Evenhuis H M, Hilgenkamp T I M. *Physical fitness of children and adolescents with moderate to severe intellectual disabilities*[J]. *Disability and rehabilitation*, 2020, 42(18): 2542-2552.
- [9] Kidokoro T, Tomkinson G R , Jlang J ,et al.*Physical fitness before and during the COVID-19 pandemic:Results of annual national physical fitness surveillance among 16,647,699 Japanese children and adolescents between 2013 and 2021*[J]. *Sports and Health Science(English)*, 2023, 12(2):246-254.
- [10] Haugland E S, Nilsen A K O, Okely A D, et al. *Multivariate physical activity association patterns for fundamental motor skills and physical fitness in preschool children aged 3–5 years*[J]. *Journal of Sports Sciences*, 2023, 41(7): 654-667.
- [11] Yan J .*Improving Classroom Teaching Quality of Architectural CAD Through the Integration of Competition Content* [J].*World Architecture (Hundred Views)*, 2023, 7(1):25-29.