

The Development of Physical Education Learning Management using by Applied Basketball Game for Students in Changsha Lushan International Primary School

¹Kang Xu, ^{2*}Jakrin Duangkam, and ³Phunarat Phiphithkul

**Corresponding author*

Faculty of Education, Udon Thani Rajabhat University, Thailand

Email: ¹49951023@qq.com, ^{2*}jakrin.d@udru.ac.th, ³phunarat007@hotmail.com

Received April 10, 2025; **Revised** May 12, 2025; **Accepted** May 30, 2025

Abstract

This study aimed to study 1) the development of physical education learning management using applied basketball game teaching for students; 2) the comparison of physical education learning management after the experiment between experimental groups and control group students; and 3) the satisfaction level after the experiment of experimental group students. The sample group consisted of third-grade students from Lushan International Primary School in Changsha, Hunan Province. Researchers used cluster sampling to select two experimental classes and determined the experimental group and control group by simple random sampling through drawing lots. This study was conducted twice a week for 40 minutes each time, for a total of 12 weeks. The research tools used in the study included 1) physical education teaching using applied basketball game teaching by 5 experts analyzing content validity, consisting of 24 lesson plans with an IOC average between 0.80–1.00; 2) students' physical fitness test; 3) basketball skills test; and 4) a satisfaction questionnaire test with a reliability of 0.92, 0.87, and 0.82, respectively. Analyze the data using mean and standard deviation, and use a t-test to test for differences in mean scores. The research results were found as follows:

1. The average physical fitness and skills of basketball in the experimental group significantly improved at the .05 level. However, the average physical fitness and skills of basketball students who received regular physical education teaching did not show significant changes at the .05 level. 2. After the experiment, the average physical fitness and basketball

skills of the experimental group students were significantly higher than those of the control group at the .05 level, and 3. After the experiment, it was found that the students in the experimental group were overall highly satisfied with the method of teaching basketball and basically reached a very satisfied level.

Keywords: Physical Education; Physical Fitness; Basketball skills; Students satisfaction

Introduction

Basketball is currently one of the most popular and widely practiced sports in my country. It has a deep and strong mass base and is widely welcomed by the masses. Physical education (PE) is a vital component of holistic education, aiming to promote not only physical development but also social, emotional, and cognitive growth among students. In the context of primary education, it plays a foundational role in cultivating healthy habits, basic motor skills, and teamwork from an early age (Mo et al., 2024). However, traditional PE instruction often relies on repetitive drills and teacher-centered approaches, which can reduce student engagement and limit the effectiveness of skill acquisition. This challenge is particularly evident in ball games such as basketball, where young learners may struggle with the mechanical nature of conventional training.

Recent trends in educational research emphasize the importance of game-based learning (GBL) as a student-centered pedagogical strategy. GBL integrates physical activities with fun, structured games that enhance motivation, enjoyment, and learning outcomes (Cocca et al., 2020). Studies have shown that basketball, when applied through game-based instruction, helps improve not only physical fitness—such as agility, coordination, and strength but also technical skills like dribbling, passing, and shooting (Yan et al., 2024; Farhat et al., 2025). Moreover, incorporating games in PE fosters a psychologically supportive classroom environment, encouraging self-confidence, cooperation, and student autonomy (Camacho-Sánchez et al., 2023). In the Chinese educational context, the Physical Education and Health Curriculum Standard (2022 Edition) advocates for innovative teaching strategies that promote lifelong fitness, sports literacy, and meaningful learning experiences (Ministry of Education of the People's Republic of China, 2021). Within this framework, game-based basketball instruction aligns well with national goals by promoting both physical competency and student engagement in a developmentally appropriate manner.

Therefore, this study aims to develop and evaluate a physical education learning management using applies basketball-based games for primary students at Changsha Lushan International Primary School. The study investigates the effectiveness of this approach in improving students' physical fitness, basketball skills, and learning satisfaction, thereby contributing to the advancement of active, enjoyable, and student-centered physical education.

Research Objectives

1. The study development of physical education learning management using by applied basketball game teaching for students.
- 2 . The comparison of physical education learning management after the experiment between experimental and control group students.
3. Study satisfaction level in after the experiment experimental groups students.

Literature Review

Integrating game-based learning into physical education (PE) has garnered significant attention for its potential to enhance student engagement and skill acquisition. Specifically, utilizing basketball games as educational tools in primary schools offers a dynamic approach to teaching physical skills and promoting teamwork. This literature review examines the theoretical underpinnings and empirical evidence supporting the application of basketball-based games in PE curricula, with a focus on their implementation in Chinese primary schools.

Game-Based Learning in Physical Education

Game-based learning (GBL) in PE emphasizes the use of structured games to facilitate motor skill development, strategic thinking, and social interaction among students. This pedagogical approach aligns with the Teaching Games for Understanding (TGfU) model, which advocates for teaching students game strategies and skills through modified game forms. Research indicates that GBL can lead to increased student motivation and enjoyment in PE classes, fostering a positive attitude toward physical activity Camacho-Sánchez et al. (2023).

Basketball Games in Primary School PE

Implementing basketball-based games in primary school PE has shown promising results. A study by Mo et al. (2024) conducted a pilot randomized controlled trial in Chinese primary schools, revealing that a game-based basketball intervention significantly improved students basketball skills and increased their enjoyment of physical education. Similarly, research

by Waffak et al. (2022) demonstrated that utilizing the TGfU approach in basketball instruction enhanced higher-order thinking skills (HOTS) and reduced bullying behaviors among elementary school students.

Policy and Implementation in China

The Chinese government has recognized the importance of improving physical education in schools. Recent policies emphasize enhancing the quality and quantity of PE teachers and adequately staffing key sports such as basketball. This policy environment supports the integration of basketball-based games into PE curricula, providing a conducive framework for innovative teaching methods.

Summary of the Literature Review

The literature supports the use of game-based learning (GBL), particularly basketball-based games, to enhance motor skills, motivation, and cognitive engagement in primary school PE. Grounded in the Teaching Games for Understanding (TGfU) model, these approaches are shown to improve student outcomes such as enjoyment and higher-order thinking skills. The reviewed concepts inform the instructional design and outcome focus of this study. Moreover, alignment with current Chinese education policy underscores the study's relevance and applicability.

Conceptual Framework

This research is a research study. The development of physical education learning management using by applied basketball game for students. The researcher defines the research conceptual framework based on the concept/theory of physical education teaching theory together with game teaching method theory. The details are as follows.

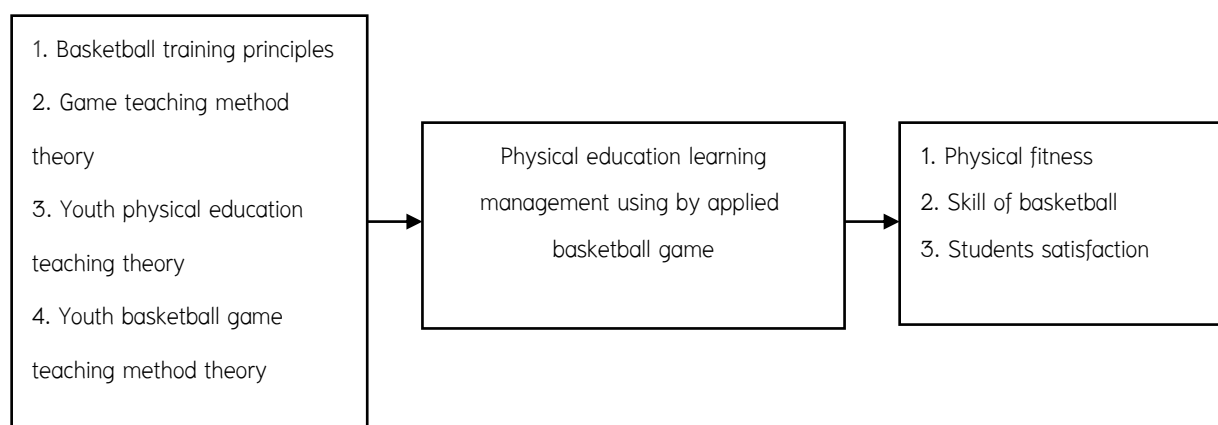


Figure 1 Conceptual Framework

Research Methodology

The research methods of this paper include literature method, expert interview method, and mathematical statistical method.

Population and Sample

This study takes the third-grade students at Lushan International Experimental Primary School in Changsha City, Hunan Province as the research subjects. The primary school has 10 classes and a total of 400 students. Researchers used cluster sampling to select two experimental classes and determined the experimental group and control group by simple random sampling through drawing lots.

Research instruments

Four research instruments were used in this study:

1. Physical education teaching plans: physical education learning management using by applied basketball game teaching, consisting of 24 plans by 5 experts in major physical education analyzing content validity and evaluating alignment with objectives through Item Objective Congruence (IOC) average between 0.80–1.00.

2. The physical fitness test: (1) 50m run (2) Sitting forward bend (3) 1-minute skipping rope (4) 1-minute sit-ups (5) Balance ability measurement form National students physical health standards test in China with a reliability of 0.92.

3. Skills of Basketball test: (1) Dribbling alternately with left and right hands (unit) (2) Passes (3) Shooting (4) Dribble and layup with a reliability of 0.87

4. Satisfaction Questionnaire with a reliability of 0.82

3. Data collection

Data were collected over a period of 12 weeks, with measurements taken at two time points:

1. Pre-Test: Before teaching began.
2. Post-Test: After the 12th week of teaching.

4. Data Analysis

The analysis methods are as follows:

1. The mean and standard deviation for the experimental and control groups.
2. Compared physical fitness and Skills of Basketball test at two time points (before teaching and after 12 weeks) using:

2.1 Dependent t-test to compare within-group differences the experimental and control groups significance at $p < 0.05$.

2.2 Independent t-test to compare differences between the experimental and control groups significance at $p < 0.05$.

Research Results

Objective 1. The results showed that in physical fitness and skills of basketball between the experiment and the control group before the experiment began was no significant, all students are on the same level of physical activity.

Table 1 Results comparison of test data of physical fitness and skills of Basketball between the experimental group and the control group before the experiment.

Pre-test (n=80)			Experimental		Control		<i>t</i>	<i>p</i>
			(n=40)		(n=40)			
			Mean	S.D.	Mean	S.D.		
Physical fitness	1.	50m run (s)	9.636	0.467	9.699	0.431	0.574	0.569
	2.	Sitting forward bend (cm)	6.077	2.786	6.574	1.742	1.680	0.101
	3.	1-minute skipping rope (unit)	23.367	6.615	25.559	3.517	0.254	0.801
	4.	1-minute sit-ups (unit)	37.633	7.379	40.150	3.782	0.687	0.496
	5.	Balance ability (s)	7.476	3.716	8.236	0.803	0.678	0.502
Skills of Basketball	1.	Dribbling alternately with left and right hands (unit)	20.271	4.950	21.700	2.705	0.344	0.733
	2.	Passes (unit)	27.033	5.714	27.200	3.819	0.119	0.906
	3.	Shooting (unit)	3.133	1.814	3.467	0.274	1.180	0.245
	4.	Dribble and layup (s)	65.259	7.446	63.144	0.556	0.944	0.351

* $p < .05$

Objective 2. Results comparison of physical fitness and skills of Basketball test data before and after 12weeks the experiment and control within the group.

Table 2 Results comparison of physical fitness and skills of basketball test before and after 12weeks the experiment and control within the group.

Experimental (n=40)		Pre-test		Post-test		t	p
		Mean	S.D.	Mean	S.D.		
Physical fitness	1. 50m run (s)	9.636	0.467	9.052	0.389	5.65	0.00*
	2. Sitting forward bend (cm)	6.077	2.786	9.443	1.943	-5.286	0.00*
	3. 1-minute skipping rope (unit)	23.367	6.615	34.333	6.935	6.031	0.00*
	4. 1-minute sit-ups (unit)	37.633	7.379	48.473	9.046	-5.52	0.00*
	5. Balance ability (s)	7.476	3.716	10.536	1.33	-3.861	0.00*
Skills of Basketball	1. Dribbling alternately with left and right hands (unit)	20.271	4.950	27.843	4.452	-6.358	0.00*
	2. Passes (unit)	27.033	5.714	34.181	6.445	-4.491	0.00*
	3. Shooting (unit)	3.133	1.814	6.133	1.479	-7.323	0.00*
	4. Dribble and layup (s)	65.259	7.446	37.037	2.551	19.204	0.00*
Control (n=40)		Pre-test		Post-test		t	p
		Mean	S.D.	Mean	S.D.		
Physical fitness	1. 50m run (s)	9.699	0.431	9.618	0.335	0.819	0.418
	2. Sitting forward bend (cm)	6.574	1.742	6.840	1.792	-0.744	0.461
	3. 1-minute skipping rope (unit)	25.559	3.517	26.861	3.759	-1.477	0.148
	4. 1-minute sit-ups (unit)	40.150	3.782	41.190	3.334	-1.252	0.218
	5. Balance ability (s)	8.236	0.803	8.230	0.779	0.034	0.973
Skills of Basketball	1. Dribbling alternately with left and right hands (unit)	21.700	2.705	22.122	2.863	-0.779	0.44
	2. Passes (unit)	27.200	3.819	27.792	3.429	-0.886	0.381
	3. Shooting (unit)	3.467	0.274	3.596	0.537	-1.412	0.166
	4. Dribble and layup (s)	63.144	0.556	62.616	2.022	1.559	0.127

* $p < .05$

The results indicated that the experimental group demonstrated statistically significant improvements in both physical fitness and basketball skills after 12 weeks of participating in a basketball game-based teaching program ($p < .05$). Physical fitness indicators including the 50-meter run, sitting forward bend, 1-minute skipping rope, 1-minute sit-ups, and balance ability showed enhancement across all measured aspects. Similarly, basketball skill performance significantly improved in dribbling, passing, shooting, and dribble-layup. These findings support the effectiveness of incorporating game-based basketball instruction in improving primary students physical fitness and sport-specific skills. The control group average physical fitness and skills of

basketball students who received regular physical education teaching did not show significant changes at the .05 level.

Objective 2. Results comparison of physical fitness and skills of Basketball test data between the experimental group and the control group after 12weeks the experiment.

Table 3 Results comparison of physical fitness and skills of basketball test data between the experimental group and the control group 12weeks the experiment.

Post-test (n=80)			Experimental (n=40)		Control (n=40)		<i>t</i>	<i>p</i>
			Mean	S.D.	Mean	S.D.		
Physical fitness	1.	50m run (s)	9.052	0.389	9.618	0.335	5.658	0.00*
	2.	Sitting forward bend (cm)	9.443	1.943	6.840	1.792	3.166	0.00*
	3.	1-minute skipping rope (unit)	34.333	6.935	26.861	3.759	6.031	0.00*
	4.	1-minute sit-ups (unit)	48.437	9.046	41.190	3.334	-5.52	0.00*
	5.	Balance ability (s)	10.536	1.33	8.230	0.779	-3.861	0.00*
Skills of Basketball	1.	Dribbling alternately with left and right hands (unit)	27.843	4.452	22.122	2.863	-6.358	0.00*
	2.	Passes (unit)	34.181	6.445	27.792	3.429	-4.491	0.00*
	3.	Shooting (unit)	6.133	1.479	3.596	0.537	-3.305	0.00*
	4.	Dribble and layup (s)	37.037	2.551	62.616	2.022	19.204	0.00*

* $p < .05$

Table 3 shows after the experiment, a paired sample t-test was performed on the test data of the control group and the experimental group, and it was found that the physical fitness and skills of basketball score $p < .05$, indicating that there was a significant difference between the data of the control group the experimental group after the experiment.

Objective 3. Results satisfaction test data of the experimental group.

Table 4 Results data students satisfaction of the experimental group

Topic	Contents	Mean	S.D.	Interpretation	Ordinal Number
1. Learning Activity Management	1.1 The teaching method is fun and interesting.	4.78	0.41	Highest	2
	1.2 Teaching methods to improve understanding of basketball class content	4.68	0.47	Highest	5
	1.3 This teaching method helps students better understand the steps to practice basketball.	4.74	0.44	Highest	4
	1.4 This teaching method enables students to practice basketball correctly.	4.75	0.43	Highest	3
	1.5 Overall, how satisfied are you with the learning activity management and centralized teaching methods of basketball game teaching?	4.83	0.38	Highest	1
2. Evaluation of Learning Management	2.1 Classroom evaluation criteria are clear and appropriate.	4.62	0.49	Highest	3
	2.2 Teacher evaluation criteria is fair	4.51	0.50	Highest	5
	2.3 Assessment accurately reflects students' abilities	4.60	0.52	Highest	4
	2.4 The difficulty of the exam is appropriate to the students ability.	4.80	0.40	Highest	1
	2.5 The test items are adapted to the examination time.	4.68	0.47	Highest	2
Total Evaluation of Learning Management		4.64	0.49	Highest	2
3. Benefits from Learning Activities	3.1 How your application abilities are acquired with knowledge and skills your daily life?	4.60	0.49	Highest	2
	3.2 How many methods of this study have improved your self-study ability?	4.57	0.50	Highest	3

Topic	Contents	Mean	S.D.	Interpretation	Ordinal Number
	3.3 To what extent do these learning activities increase your motivation for learning and practicing basketball?	4.74	0.44	Highest	1
	3.4 How much does basketball game teaching method improve basketball skills?	4.54	0.50	Highest	5
	3.5 Overall, what do you think are the benefits of teaching basketball games compared to traditional methods?	4.55	0.50	Highest	4
Total Benefits from Learning Activities		4.60	0.49	Highest	4
4. Teacher	4.1 Teachers are attentive and friendly to students, which helps improve the classroom atmosphere.	4.58	0.56	Highest	4
	4.2 The teacher provides opportunities for students to express their opinions, practice, and discover knowledge on them.	4.51	0.50	Highest	5
	4.3 Teachers are attentive, helpful and provide guidance when students have difficulties misunderstanding or suspicion.	4.60	0.52	Highest	3
	4.4 The teacher allows students to ask questions both during and outside of class time.	4.69	0.47	Highest	2
	4.5 The teacher respects and consistently praises students appropriately.	4.71	0.46	Highest	1
Total Teacher		4.62	0.51	Highest	3

Table 4 summarizes that students have the highest satisfaction with the teaching and learning of physical education subjects in basketball physical education classes using basketball game teaching methods (mean=4.65, S.D.=0.48). When considering each aspect, it was found that: Satisfaction with the Learning Activity Management has the highest level of satisfaction

(mean= 4.76, S.D.=0.43); Satisfaction with Evaluation of Learning Management (mean=4.64, S.D.=0.49); Satisfaction with Teacher (mean=4.62, S.D.=0.51); Satisfaction with Benefits Obtained from Learning Activities (mean=4.60, S.D.=0.49). After the experiment, through on-site survey statistics, collection and analysis by teachers, the results were analyzed and summarized from four aspects. It was found that the students in the experimental group were overall highly satisfied with the basketball game teaching method and basically reached a very satisfied level.

Discussions

“The development of physical education learning management using by applied basketball game for students in Changsha Lushan International Primary School” there are interesting findings that discussion to as follows:

1. The findings reveal that the basketball game teaching method had a substantial impact on various aspects of students’ physical fitness, including speed, strength, endurance, coordination, and flexibility. Students in the experimental group showed greater improvements compared to those in the control group, who only received traditional instruction. This supports the view that physical education should be tailored to the physiological and psychological characteristics of children and adolescents. Mo et al. (2024) and Cocca et al. (2020) emphasized that integrating fun, game-based physical activities into instruction significantly enhances children’s physical development compared to conventional methods. However, such methods must be guided by developmental psychology to avoid excessive or inappropriate training loads. Farhat et al. (2025) the researchers implemented a structured basketball training regimen focusing on functional tasks to enhance motor skills and confirmed through experimental research that basketball training enhances physical form in children aged 7–12, especially in upper-body development and speed quality. Liu also emphasized the importance of individualizing flexibility training to accommodate developmental differences among children.

2. The game-based teaching approach led to clear improvements in students’ basic basketball skills, dribbling, passing, and shooting. The use of engaging game contexts allowed students to practice and internalize movements more naturally, increasing both their performance and enjoyment. This supports Barba-Martín et al. (2020), who found that game-based methods enhance skill acquisition by aligning instruction with students’ interests and learning characteristics. Yan et al. (2024) The study concluded that implementing a game-based basketball program in primary school PE classes is feasible and can lead to positive outcomes for both teachers and

students. The program effectively enhanced teaching practices and improved students' physical and psychological engagement in PE, while innovative and game-integrated approaches stimulate curiosity and sustain engagement. Game-based instruction therefore not only improves physical skill but also nurtures psychological readiness and motivation to learn.

3. Students in the experimental group reported higher satisfaction with the basketball game teaching method. This approach promoted a collaborative, respectful, and psychologically safe classroom environment that enhanced student participation, confidence, and intrinsic motivation. These findings are supported by Maslow (1970), which identifies safety, belonging, and self-actualization as critical motivators in human behavior. Moreover, the student-centered, experiential nature of the basketball game method is consistent with Dewey (1998), which experiential learning theory emphasizes the role of meaningful, interactive experiences in education. Game-based learning creates such opportunities, allowing students to learn by doing, reflecting, and engaging in socially supportive environments and These findings are supported by Rifaldo et al. (2023) The findings revealed that incorporating these games into training significantly enhanced the athletes motivation and discipline, suggesting that such game-based approaches can be effective in developing both the skills and character of young players.

Knowledge from Research

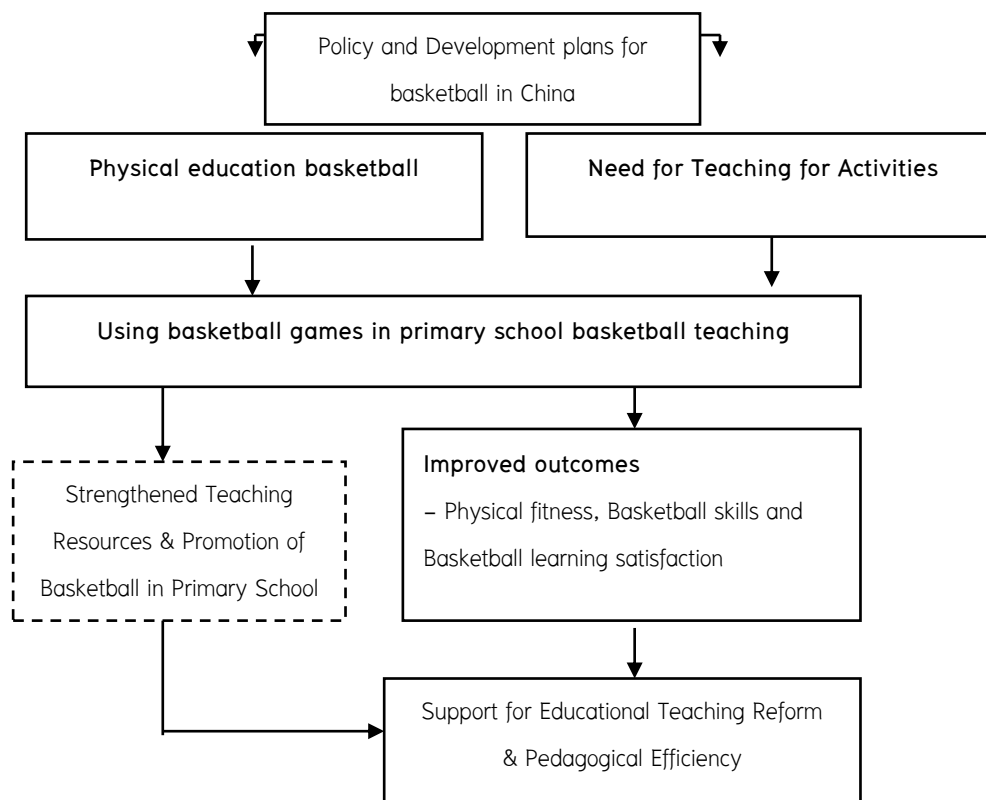


Figure 2 Diagrams knowledge from research

This study basketball in China by game-based teaching strategies tailored to primary school physical education. In response to current challenges in basketball instruction such as limited engagement and misalignment with students' developmental needs the research explores whether incorporating basketball games can enhance students' physical fitness, skill acquisition, and learning satisfaction. Findings suggest that game-based basketball teaching holds both theoretical and practical value, offering a promising approach to reforming traditional methods and improving the overall effectiveness of basketball education at the primary level.

Conclusion

The findings of this study can be conclusion according to the research objectives as follows:

1. The impact of game teaching method on physical fitness students: After 12 weeks of basketball game teaching experiments, in terms of physical fitness students, explosive power, speed, endurance, agility, core strength, coordination, etc. have all been significantly improved, and the improvement in the experimental group was higher than the control group.

2. The impact of game teaching method on students skills of basketball: The research results show that basketball game teaching methods have a significant impact on improving the basic skills of basketball, including dribbling, passing and shooting. The experimental group made significant progress in these measures in the whole 12 weeks, while the control group received regular teaching plans. The game teaching method transforms boring training into interesting games, stimulates students interest in learning and intrinsic motivation, and encourages students to participate in learning more actively.

3. The impact of game teaching method on students satisfaction: The results showed that the experimental group showed high satisfaction with the basketball game teaching method. After investigation, this teaching method improves students' learning motivation, creates a supportive and cooperative classroom atmosphere, and promotes psychological safety. The supportive classroom atmosphere created by basketball game teaching method makes students feel respect and attention, to promote their participation and self-confidence.

Suggestions

Suggestions for this study:

Through a 12-week basketball game teaching, the physical fitness and basketball skills of the experimental group students were significantly improved, and their learning satisfaction was high. Therefore, the basketball curriculum in primary schools in China can adopt game-based methods to complete teaching tasks in a happy and joyful teaching environment.

Suggestions for future researchers:

Limitations of this study: Due to the limited sample size, only two classes of students were tested, which may not be sufficient to evaluate the long-term effects of basketball game teaching methods. Future researchers should increase the sample size to improve the accuracy of experimental results.

References

Barba-Martín, R. A., Bores-García, D., Hortigüela-Alcalá, D., & González-Calvo, G. (2020). The application of the teaching games for understanding in physical education: Systematic review of the last six years. *International Journal of Environmental Research and Public Health*, 17(9), 1–16. <https://doi.org/10.3390/ijerph17093330>

- Camacho–Sánchez, R., Manzano–León, A., Rodríguez–Ferrer, J. M., Serna, J., & Lavega–Burgués, P. (2023). Game–based learning and gamification in physical education: A systematic review. *Journal Education Sciences*, 13(2), 1–12. <https://doi.org/10.3390/educsci13020183>
- Cocca, A., Espino Verdugo, F., Ródenas Cuenca, L. T., & Cocca, M. (2020). Effect of a game–based physical education program on physical fitness and mental health in elementary school children. *International Journal of Environmental Research and Public Health*, 17(13), 1–13. <https://doi.org/10.3390/ijerph17134883>
- Dewey, J. (1998). *Experience and education*. Indiana: Kappa Delta Pi.
- Farhat, F., Ammar, A., Mezghani, N., Kammoun, M. M., Trabelsi, K., Gharbi, A., Sallemi, L., Rebai, H., Moalla, W., & Smits–Engelsman, B. (2025). The effect of task–oriented basketball training on motor skill–related fitness in children with developmental coordination disorder. *Journal Sports*, 13(3), 1–18. <https://doi.org/10.3390/sports13030062>
- Maslow, A. H. (1970). *Motivation and personality*. (2nd ed.). New York: Harper and Row.
- Ministry of Education of the People’s Republic of China. (2021). *Physical education and health curriculum standard in compulsory education stage*. Beijing: People's Education Press.
- Mo, W., Saibon, J. B., Li, Y., Li, J., & He, Y. (2024). Effects of game–based physical education program on enjoyment in children and adolescents: A systematic review and meta–analysis. *BMC Public Health*, 24(517), 1–20. <https://doi.org/10.1186/s12889-024-18043-6>
- Rifaldo, M. F., Widiyanto, & Abdillah, M. J. (2023). Fun game–based football training model for increasing motivation and discipline of young athletes. *International Journal of Physical Education, Sports and Health*, 10(1), 394–396. <https://doi.org/10.22271/kheljournal.2023>
- Waffak, M. N., Sukoco, P., Sugiyanto, F. X., Arifianti, E., Setiawan, J., & Daryono, R. W. (2022). Developing a basketball learning model using the Teaching Game for Understanding (TGfU) approach to improve the effectiveness of HOTS in elementary schools. *Journal Physical Education Theory and Methodology*, 22(3), 134–145. <https://doi.org/10.17309/tmfv.2022.3s.03>
- Yan, J., Morgan, P. J., Smith, J., Chen, S., & Eather, N. (2024). Pilot randomized controlled trial of a game–based intervention for teaching basketball in Chinese primary school physical education. *Journal of Sports Sciences*, 42(1), 25–37. <https://doi.org/10.1080/02640414.2024.2319457>