

Research Article

Effect of Game Teaching Assisted by Deep Reinforcement Learning on Children's Physical Health and Cognitive Ability

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In order to strengthen children's physical health and cognitive ability, further promote the development of children's teaching, and strengthen the promotion and application of game teaching in children's teaching, this paper takes game teaching under learning guidance as the research basis. First, combined with relevant information on children's teaching practice in China and foreign countries, teaching practice is carried out from the aspects of preparation, process, analysis and evaluation, reflection, and so on. Second, the questionnaire method, interview method, and observation method are used, and the application status of game teaching in children's teaching is analyzed to make statistics and summary. Finally, by comparing the test results of the experimental class and the comparative class to understand the students' knowledge after the completion of teaching, conclusions are drawn to understand the role of game teaching in students' learning. The research finds that more than half of 56% of teachers believe that game teaching is very important in the teaching process, and 31% of teachers believe that game teaching is not important in the teaching process. It shows that although most teachers are aware of game teaching, a large proportion of teachers still has insufficient awareness of effective teaching. It is necessary to improve teachers' attention and understanding of effective teaching. Through experimental research on the influence of game teaching on children's physical health and cognitive ability in the classroom, the study found that 46% of the experimental group were not interested in learning before the experiment. After the experiment, it became more fun. After testing, 72% of the students said they were satisfied. 92% of the students said that playing games is a kind of enjoyment. It shows that game teaching can not only enhance children's learning interests, but also enrich children's emotions and cognition. Game teaching is of great help to young children's healthy development and cognitive ability. In addition, through interviews with teachers, the current situation of game teaching is summarized and analyzed. The research results show that in the teaching process, students can participate in game teaching happily, autonomously, and actively. Regarding game teaching assistance in teaching, teachers can break through the traditional professional division of labour barriers, and students can become curriculum designers, implementers, evaluators, and managers. It is hoped that there will be more comprehensive and detailed research in the future to provide more valuable, scientific, and effective research conclusions for future research work and other related research.

1. Introduction

1.1. Research Background and Motivations. From the physical and mental characteristics of students in early childhood, the game teaching method can enable students to establish a positive learning attitude and improve students' enthusiasm for classroom participation, which has great

application value for the teaching of any subject [1]. Therefore, kindergarten teachers should understand the positive impact of the game teaching method on classroom teaching and know how to integrate games into teaching content and apply them in the classroom to improve students' enthusiasm and make students feel happy to acquire knowledge and skills in game activities, cultivate students'

good learning attitude, and improve the quality of students' game teaching in kindergarten [2].

In kindergarten, children can acquire knowledge and skills in various entertainments and organized games to achieve educational and teaching goals [3]. This idea of early childhood education based on children has been reflected in many recognized early childhood education [4]. It can be seen that, whether in terms of development, evolution, or the current preschool education policy and actual situation, "game-based teaching" has been recognized, valued, and even highly valued by kindergarten education in European countries [5]. In Europe, the use of games as a kind of education and an educational way to achieve educational goals is already an "unconscious" common understanding. However, this common view has caused concern among some children's mental development experts and kindergarten researchers, who regard games as a means of teaching for developing children's knowledge and skills but do not pay more attention to children's physical fitness and cognitive experience [6]. Therefore, exploring the nature of play and its true significance for children's survival and development can help early childhood educators, policymakers, and parents understand the source of this "concern" in a sense [7]. In children's education, due to children's characteristics, they like untouched "white paper" in teachers' eyes, so their plasticity in kindergarten is very high [8]. During this period, children's thinking and habits will gradually form. Therefore, in the education process, teachers should continuously deepen their understanding of the content to achieve the extension of "game teaching." Early childhood is a critical period for a healthy personality, and early childhood education plays an important role in the formation of a person's personality. In early childhood, the child's personality qualities begin to germinate and gradually form. At this time, the child's plasticity is strong, and self-evaluation has not yet been established, and the evaluation of parents and teachers is often used to evaluate themselves. If children are given the correct education and good guidance during this period to form a good personality and quality, it will have an important impact on their lives. On the contrary, if some bad personality qualities or behavioural habits are formed during this period, it will be difficult to correct them later [9]. Therefore, the correct guidance and education of children in the early childhood stage are very important for cultivating children's learning abilities and cognitive habits.

Therefore, the effect of game teaching on children's physical health and cognitive ability under the guidance of deep reinforcement learning is explored, questionnaires on students before and after participating in game teaching are conducted, and the results are compared. At the same time, it has very important practical significance for improving teachers' educational quality and ability.

1.2. Research Objectives. This work takes the kindergarten teaching classroom as the research background and takes the cognitive ability and physical health of games in the teaching of children as the research content. Through the comparison

and analysis of students, kindergarten teachers are provided with a scientific and rational understanding of the characteristics and laws of things and gradually form a rigorous and standardized logical thinking ability. On this basis, higher requirements are put forward for the overall quality of teachers, and the impact of kindergarten on students' physical health and cognitive ability is improved, so that it can achieve a win-win situation between subject education and comprehensive quality education.

2. Literature Review

2.1. Research Literature. Because in European early childhood education, games have always been regarded as a way to help children better complete their growth, so play teaching is widely used in European kindergartens. In Europe, and even in some other western countries, games are considered essential in children's early education and development [10]. In the 18th century, the famous German educator Friedrich Froebel boldly said, "In childhood, games are the highest realm of human development, because they are a free expression of children's minds" [11, 12]. He believes that children can learn about the world by improving their physical development, emotional health, psychological ability, and social relations through personal experience while playing [13, 14].

It is found that students using the game-based vocabulary practice system can attract their attention and interest, have a higher learning effect, and provide positive learning motivation feedback [15]. Digital game-based learning has been seen as an engaging teaching method to foster student learning and motivation [16]. Combining competitive play with personalized assistance can serve as a way to reduce anxiety, increase immersion, and improve the overall effectiveness of the program [17]. Traditional teaching usually fails to attract learners' full attention, which reduces their interaction, participation, and involvement in content [14]. Using game teaching combined with emerging media and using the developed game-based TUI system can improve preschool children's learning behaviours, and improve their learning interest and computational thinking abilities [18]. There are also various online learning applications created in the form of games. Gaming apps are one of the educational media models that teachers and students can use as learning tools [19]. It will be easier and more interesting for children to learn counting with the educational learning media Counting Tree, which can also improve their cognitive abilities [20].

In the process of teaching children, because children's cognitive ability and learning ability has not formed, teachers in early childhood compared to other teaching stages need to develop teaching plans for children's physical health and cognitive ability [21]. Therefore, children's game-based teaching under the guidance of in-depth teaching has gradually entered the vision of preschool teachers. Compared with other teaching methods, children's game-based teaching has more respect for children's subjectivity in the early childhood teaching stage and is more suitable for children to improve and develop their abilities under the

teaching mode [22]. However, gamification teaching has stricter requirements on teachers' abilities. Many teachers do not have an accurate cognition of gamification teaching, resulting in the difference between the actual effect and the ideal state [23].

In the study of early childhood education in China, Chinese scholars through the investigation method, observation method, interview method, and other methods to investigate the current situation of kindergartens in different regions can grasp the current situation of kindergarten physical education to a certain extent. The analysis of the relevant data of the current situation can further find out the problems and put forward relevant countermeasures according to the problems. For example, in his paper "On the Adaptive Development of Children in Kindergarten Physical Education," Chuang pointed out that in the current stage, Nanjing kindergarten physical education needs to be strengthened in enhancing children's physique, promoting children's physical and mental health, and developing physical exercise habits. Chinese government departments encourage private capital to invest in kindergartens, and there are more and more private kindergartens in society. The current situation of physical education in private kindergartens should also be paid attention to [24]. In this regard, Gao et al. pointed out in their paper "On the Current Situation and Countermeasures of Physical Education in Urban Kindergartens in Leshan City" that there are still extremely unbalanced teaching venues, equipment, and facilities in Leshan City urban kindergartens in physical education. The situation of privately run kindergartens is not optimistic. There is a serious shortage of preschool physical education professional teachers. The teaching organization and teaching content are relatively casual. Most of them do not offer professional physical education classes for children, lack scientific outlines and plans, and have insufficient exercise load [25]. Through experiments on 671 children, Schore concluded that teachers' purposeful activity teaching for children can promote children's cognitive intelligence and language intelligence, and enhance children's social skills [26]. Lian believes that the training of early childhood sports educators requires multilevel and multiobjective analysis to build a talent training system for early childhood education. The development and improvement of early childhood physical education is very important. Adopting the concept of "full practice" helps to combine theory and practice, improve the effectiveness of teaching, and promote the reform of the education system. The application of data-based and intelligent teaching to real-time monitoring of children's physical conditions will help improve the effectiveness of early childhood education [27]. Zeng develops the ADDIE teaching model through analysis, design, development, implementation, and evaluation. The proportion of data before and after the experiment shows that they are 11.09% and 7.25%, respectively. He believes that ADDIE is a learning model that promotes the development of children's creativity [28]. Zhang's book "Research on Preschool Physical Education" analyzes the physical education of preschool children in-depth in the theoretical part, and puts forward the practical ideas of preschool physical education

in the practical part. The content includes the practice of basic physical skills, the practice of basic gymnastics, and the activities of light equipment and classroom games [29].

Therefore, based on the professional development of teachers in game teaching, the concept of education is implanted in the education of children, their professional ability is improved, and more scientific research methods are used. Finally, through kindergarten education, the game spirit throughout the game teaching is made, and the previous game teaching experience is critically studied.

2.2. Theoretical Basis. The theoretical basis includes game theory and multiple intelligences theory.

2.2.1. Game Theory. Game theory was only initially formed at the end of the 19th century. German educator Froebel proposed a brand-new theory, which provided great help to the development of philosophy, literature and art, education, psychology, and other fields. What he proposed was the theory of games. He constructed a game teaching theory based on the physical and mental characteristics of children, and meanwhile introduced the internal mechanism of promoting the effect of games on children's physical and mental development, so that the formation of the game teaching theory can lay a solid foundation. He proposed that all kinds of games can make children's psychological states and psychological trends become independent, self-controlled surface self-expressions to obtain happiness, joy, and self-satisfaction. Meanwhile, the outside and the inside are adapted. Children always show the characteristics of happiness, enthusiasm, and unity through games, and show the will of hard work and tolerance. So, play can make children kind. The establishment of game theory makes a fundamental change in traditional physical education. The physical education class has changed from a simple and boring exercise to a lively and interesting physical education class. The concept of lifelong sports has become the guiding ideology of sports-related curriculum reform. The diversification of physical education courses, the diversification of goals, and the needs of school physical education have gradually become the development trend of contemporary physical education, and the game-based physical education model is based on the development of students. The development of the teaching mode is the focus and goal of the teaching mode, and it pays attention to the unity of all-round development and personality cultivation of all students. As far as physical education teachers are concerned, their roles also include innovators, planners, and builders in the teaching process. At the same time, they also need to continuously optimize the course content and structure, teaching content, student movement mode and content, and teaching atmosphere during the teaching period.

2.2.2. Multiple Intelligences Theory. The theory of multiple intelligences (Figure 1) was created by Professor Gardner of Harvard University in the United States for 9 years. Professor Gardner and Professor Feldman of Tufts University in

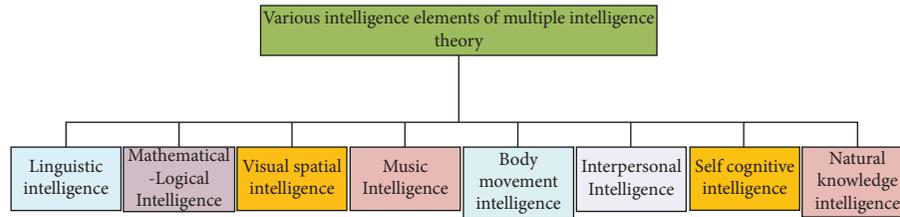


FIGURE 1: Eight elements of multiple intelligences theory.

the United States jointly conducted research on existing intelligence and further explored challenges. The theory of multiple intelligences has carried out related experiments from psychology, sociology, intelligence, and other research fields. Based on the research, it is proposed that multiple intelligences include language intelligence, mathematical logic intelligence, music intelligence, spatial intelligence, body-kinaesthetic intelligence, interpersonal intelligence, self-knowledge intelligence, and natural observation intelligence. Prof. Gardner analyzed this, and he believed that what was important was not the seven or eight kinds of intelligence, but a diverse method of knowing, understanding, and researching intelligence.

3. Research Methodology

3.1. Object of Investigation. The research objects are 100 students from Class One and Class Two of XX Garden in XX District of XX City. There are 50 students in Class One, including 27 boys and 23 girls. Class Two is the control class of Class One, which also has 50 students, 28 boys and 22 girls. After entering kindergarten, the two classes have similar teaching teachers and teaching modes. There is not much difference in their age, gender, number, and learning ability, which also laid the foundation for the smooth progress of the experiment.

3.2. Means of Investigation. Questionnaire: Collect relevant data in the form of questionnaires, organize, compare, and analyse (attribute) the obtained data; make statistics and summaries of the data.

Observation: Through in-depth classroom observation, observe students' learning in the classroom, understand the classroom teaching situation, observe and compare the effects of the experimental class and the control class in game teaching, and obtain valuable materials.

Case teaching: Guided by the idea of game teaching, for preschool teaching, the corresponding teaching strategies are put forward, and through the illustration and comparison of examples, a relatively complete curriculum preparation, teaching process, curriculum analysis, evaluation, curriculum reflection, and other contents are designed.

Interview: In the classroom of game teaching, the teachers who participated in the activities are interviewed after class, and their roles and difficulties in teaching are summarized.

4. Experimental Design and Performance Evaluation

4.1. Datasets Collection. In order to deeply discuss the effect of games on the cognitive ability and physical health of kindergarten students in classroom teaching, the research mainly adopts the method of a questionnaire survey. The survey subjects selected by the questionnaire survey and the experimental method are mainly divided into two parts. One part is the control class students, and the other part is the experimental class students. The number of the two parts of survey subjects is equal. The proportion of boys and girls in the control class and the experimental class is close to 1 : 1. Therefore, the differences in the subjects of the questionnaire survey are small, and the results of the questionnaire are more authentic and credible. Before the experiment and after the experiment, questionnaires are distributed to the children in the experimental class and the control class. The kindergarten teachers ask the children one by one and record the children's choices to ensure that the children could understand each question on the scale before and after the experiment. The recovery rate of the questionnaires distributed later is 100%. A total of 100 questionnaires are sent out, 100 are returned, 100 are valid, and 0 are invalid (invalid questionnaires contain no missing questions and incomplete data). After the questionnaires are collected, the questionnaires are classified and sorted, the data in the questionnaires are preliminarily sorted out, the data are input into the Excel system for statistics, and the two classes are analyzed with the help of Origin software. Through the comprehensive arrangement of the two courses of the two classes, the comparison and analysis are carried out, and finally, the conclusion is drawn.

4.2. Experimental Environment. The experimental site of this experiment is XX Park, XX District, XX City. The specific location is the classrooms of Class 1 and Class 2 of XX Kindergarten. The specific time is from September 2021 to December 2021, with a total of 32 class hours. It lasted for 16 weeks, and the specific development time was from 8 : 30 am to 9 : 05 am every Monday and Friday, and the teaching time of each class was 35 minutes. This experiment plans to use the experimental group and the control group to conduct teaching experiments. Before the start of the experiment and after the end of the experiment, the pretest and posttest of the children in the two groups are conducted, respectively, and the specific classroom conditions of the

groups of children investigated during the experiment are recorded. The children in the experimental group are taught in game classrooms, while the children in the control group are taught in the conventional teaching mode of kindergartens.

With the implementation of the new curriculum standard, the traditional education method has received widespread attention from teachers, students, and parents. Especially in the kindergarten classroom, due to the rigid traditional education method, it is difficult to adapt to children's cognitive needs, nor can they better grasp their understanding of life and enhance their physical quality, and play is the children's favourite activity.

4.3. Parameters Setting. To comprehensively test the actual effect of game teaching, through the questionnaire of a total of 100 students from Class One and Class Two of XX Garden in XX District of XX City, the comparison and analysis were carried out, and the conclusion was drawn. In addition, taking the students in Class One as the experimental research object, and the students in Class Two as the control research object, the students were investigated, and their understanding and experience of the game teaching course were observed.

4.3.1. Questionnaire Preparation. By analysing the learning situation of 100 students in Class One and Class Two of XX Garden in XX District of XX City, to improve students' enthusiasm for learning. Since children in kindergartens do not have to solve too complex problems, according to the actual situation of children, the questionnaire is designed optionally, and the language expression and structure are simplified as much as possible. Finally, their questionnaire (see appendix 1). Their learning enthusiasm was inferred from their learning style, and learning enthusiasm in the classroom. The positive attitude showed their enthusiasm for learning. Therefore, the questionnaire consists of two parts: the first part examines the changes in students' attitude towards teaching before and after the experiment; the second part is the performance of students' enthusiasm in the classroom before and after the experiment. The content of this questionnaire is concise and consist of 11 questions. Questions 1 and 2 related to the personal information of students, and questions 3 to 5 related to the interest in game teaching, whether the game teaching is full of fun, and whether they want to have game teaching every day. Question 6 is to study the motivation of game learning in elementary school. The purpose of questions 7 to 11 is to understand the learning situation of primary schools and whether they are willing to actively participate in activities.

4.3.2. Reliability Analysis of the Questionnaire. After the questionnaire design is completed, 15 children who are not the subject of this study are asked to conduct reliability tests. Reliability analysis is used to measure whether the response results of the sample are reliable. For example, after multiple

measurements are performed on the same object, the results are very close, and the results will be considered credible. Reliability can be measured by Cronbach's coefficient, half coefficient, test-retest reliability, and replica reliability. This research uses the Cronbach's alpha coefficient, which is the most commonly used educational test, to test the reliability. Generally speaking, the higher the coefficient, the higher the reliability of the questionnaire. In basic research, the reliability must be at least 0.80, but in exploratory research, the reliability is 0.70, and 0.70–0.98 is high reliability. Before the formal distribution of the questionnaire, a test-retest reliability test on the questionnaire is conducted, and two repeated measurements on the positive performance and negative performance of children's game teaching in the classroom is conducted with a time interval of one week. The reliability analysis of the results of 11 multiple-choice questions shows that the Cronbach coefficient is 0.955, exceeding 0.80. The results are credible and can reflect the specific and real situation of children's classroom teaching participation. The details are shown in Table 1.

4.3.3. Validity Analysis of the Questionnaire. After the questionnaire design is completed, 15 children who are not the subjects of this study are asked to conduct a validity test. Validity analysis, simply put, is the validity and accuracy of the questionnaire design. When designing the questions of the questionnaire, it is hoped that what the question actually measures is what is expected to be measured, so that the research data can accurately explain the problem. Validity can be divided into three types: content validity, construct validity, and criterion validity. The construct validity of the questionnaire is often measured by the method of factor analysis. The original variables should have strong correlation before factor analysis can be performed, so it is necessary to determine whether the original variables to be analyzed are suitable for factor analysis. The commonly used test methods include the Bartlett sphericity test and the KMO test. The Bartlett sphericity test method mainly observes the accompanying probability P value of the statistic, that is, the sig value should be less than 0.05, which is suitable for factor analysis. The KMO test method believes that when the KMO value is between 0 and 1, the closer the KMO value is to 1, the more suitable for factor analysis. The metric given by Kaiser is that $KMO > 0.9$ is very suitable for factor analysis, $0.8 < KMO < 0.9$ is suitable, $0.7 < KMO < 0.8$ is general, $0.6 < KMO < 0.7$ is not suitable, and $KMO < 0.5$ is not suitable for factor analysis analyse.

SPSS19.0 is used to conduct factor analysis on the 36 variables in the questionnaire. The methods used are the Bartlett sphericity test and KMO test. The survey results are shown in Table 2. The KMO measurement value is 0.931, indicating that it is very suitable for factor analysis. Meanwhile, the sig value is less than 0.05, indicating that there is a correlation between the variables, the factor analysis is effective, the questionnaire has good structural validity, and the measurement results can truly reflect reality.

TABLE 1: Reliability statistics.

Cronbach's alpha	Cronbach's alpha based on normalized terms	Item
0.955	0.956	11

TABLE 2: KMO and Bartlett's test.

Kaiser-meyer-olkin metric for sampling adequacy		0.931
Bartlett's sphericity test	Approximate chi-square	4819.829
	df	630
	sig.	0.000

4.3.4. Interview Design. In early childhood education, children's main activities are various games, which are the children's "playgrounds" in kindergartens. In this case, various types of games may be used, and kindergarten teachers often have difficulties in making appropriate choices in the learning process, so they have certain limitations. What causes this problem? Some kindergarten teachers were interviewed to find out the reasons for this situation.

4.3.5. Experimental Design

Step 1. 100 children and their teachers in XX city XX community XX garden, class one and class two are chosen as the experimental object. The questionnaires are distributed before the experiment, and the 100 children are tested before the experiment. With the help of the teacher, the questionnaires and data statistics are collected.

Step 2. The large class is generally selected as the experimental group, and the second class of the large class is used as the control group. After consultation with a substitute teacher, the same teaching content (including various types of content, such as pinyin teaching, and word teaching) is selected, and their own teachers are responsible for teaching design. After the design is completed, different classes of students are taught. Among them, the teaching design of the first class teachers needs to include at least one or more games, and the games and classrooms should be combined to design a reasonable teaching plan.

Step 3. The students in the first class use a combination of games and teaching before and in the classroom, while the second class of the large class adopts the ordinary way. During the 16 weeks of the experiment, the teachers of the first class are required to combine games in the classroom to teach, and the number of games used should also change during the period, while the students of the second class had been using ordinary teaching methods to learn during the experiment.

Step 4. After 16 weeks, the game class is over, the students in the two classes are surveyed again, and the data is collected and analyzed.

The following should be noted in the experiment:

First, in order to ensure the accuracy and rationality of the experimental process, the design, testing, and recording of all relevant experiments are completed by the same person.

Second, because the teaching levels, teaching strategies, and teaching modes of different teachers are not consistent, the teaching experiments for the experimental group and the control group are all completed by the same person.

Third, the teacher must complete the teaching plan according to the actual teaching progress during the teaching period. The process cannot indulge the student's truancy behaviour, as far as possible to reduce the number of students leaving, such as injury and physical discomfort caused by the leave, more than three times to remove the data of students. Fourth, in order to better ensure the accuracy of the experimental values, except for other related teaching activities in the classroom and sports activities organized by the school, teachers cannot provide after-school tutoring for students.

4.4. Performance Evaluation

4.4.1. Comparative Analysis of the Teaching Effect of General Teaching and Game Teaching. The comparison of the test scores of the experimental class and the control class is shown in Figure 2.

As shown in Figure 2, with the progress of game teaching, the scores of students in the two classes began to vary, and the overall average score of the experimental class gradually increased and was gradually higher than that of the control class. During the whole experiment, there was no significant change in the unit test scores of the control class.

Because of whether game teaching in children's teaching will affect their interest, two questionnaires about game teaching were conducted in the experimental class before and after the experiment. The content of the two questionnaires was the same, and the questionnaires were withdrawn immediately after the end of the questionnaires. Figure 3 shows the survey statistics of question 3 to 5 about the attitude of game teaching in the experimental class before and after the experiment.

From Figure 3, before and after the experiment, for questions 3 to 5, the students who participated in the game teaching had a significant change in the concept of game learning. Specifically, 46% of the experimental group were not interested in learning before the experiment and became more playful after the experiment ended. After the experiment, 72% of the students expressed satisfaction and 92% of the students indicate that playing games is a kind of enjoyment. Compared with 74% of the students who had no sense of the game teaching before the experiment, only 8% of the students had no fun in the game teaching after the experiment, which can be a huge change. In addition, before the experiment, the number of students who did not want to

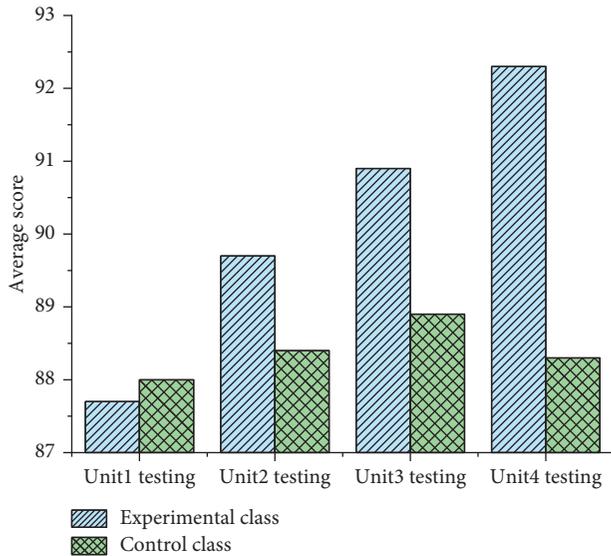


FIGURE 2: Comparison of unit test scores of experimental class and control class.

participate in game teaching decreased from 62% to 2%. After the experiment, 88% of the students expressed their willingness to participate in game teaching.

The tracking results for students after class are shown in Figure 4.

As shown in Figure 4: After the experiment, most of the students in the experimental group held a positive view of the problems in learning, which was greatly improved compared with before the experiment; the enthusiasm for learning in the experimental group was significantly higher than that in the control group; and after the experiment, the learning effect of students in the experimental class was significantly improved indicating that after the experiment, the interest of students in the experimental group in classroom teaching was significantly improved.

4.4.2. The Role of Teachers in Game Teaching. Teachers' awareness of game teaching is shown in Figure 5.

Figure 5 shows that 56% of the teachers think that game teaching is very important in the teaching process, 31% of the teachers think that game teaching is not important in the teaching process, and only 13% of the people think that the importance of game teaching to students is irrelevant.

In preschool education activities, teachers use different games to assist in teaching as shown in Figure 6 below, taking word learning and *Pinyin* learning as examples.

Figure 6 shows that 40% of teachers currently use multiple games in student learning. However, Figure 7 shows that only 10% of teachers play various games when it comes to learning *Pinyin*. Where is the problem? To this end, the authors interviewed some kindergarten teachers to find out how this situation developed. After interviewing some kindergarten teachers, it is found that there are many reasons for the above situation, among which the most important ones are as follows: First, since the work of kindergarten teachers is relatively rich at present, they must

not only do a good job in teaching students, but also complete many other tasks assigned by the school, such as being responsible for some activities in the kindergarten group and area, and some other tasks that need to be prepared. Although teachers also want to improve the fun of their classrooms and add more game content, due to limited time and energy, most teachers are also lacking in strength. Second, although most teachers are willing to accept new things and try different classroom styles and forms, in real teaching, it is difficult and challenging for teachers and students to understand and apply a new game. The most important point is the lack of creativity. In the teaching process, teachers often use their own habitual methods to teach, which also brings difficulties to the application of various game methods. Third, the game teaching itself has certain adjustments and difficulty. When the game teaching is carried out, teachers are required to construct and design according to the characteristics and rules of children's physical and psychological development. If it does not conform to the law of children's development, it has no soul and spirituality. In this case, teachers need to maintain the awareness and attitude of learning all the time, which is a challenge for some teachers, especially older ones. Therefore, in order to truly carry out the game teaching mode, it is necessary to cultivate teachers' awareness of lifelong learning, change the teaching concept in a timely manner, continue to learn, pay attention to the application in game teaching, respect students' physical and psychological characteristics, make full use of games as children's nature, and improve their professional quality through continuous learning and practice.

4.4.3. Suggestions on Carrying Out the Game Teaching Mode.

The teaching method embedded in the game is better than the traditional teaching method in terms of classroom atmosphere and teaching effect. The above experiments show that the teaching of implanted games can be said to allow students to easily dig some difficult content in advance through games. Over time, these students have a kind of post-learning achievement. These feelings of achievement for children eventually turned into interest in learning this subject, which is the real principle of implanted game teaching. However, the following points should be paid attention to in the process of developing game teaching.

First, the construction of children's game teaching classrooms should be carried out step by step.

Games about the enlightenment education of young children should be close to the psychology of young children, and the game links should be designed reasonably. It is necessary to increase the fun and storytelling of the game according to the understanding ability of children, so that children can better understand and enjoy the game. In the process of implementing the game, it is necessary to progress from the shallower to the deeper, to gradually increase the difficulty and enhance the students' skills, so that every child can understand and join the game. For children, it should be fair and just, patient respect to continue to push forward this kind of game.

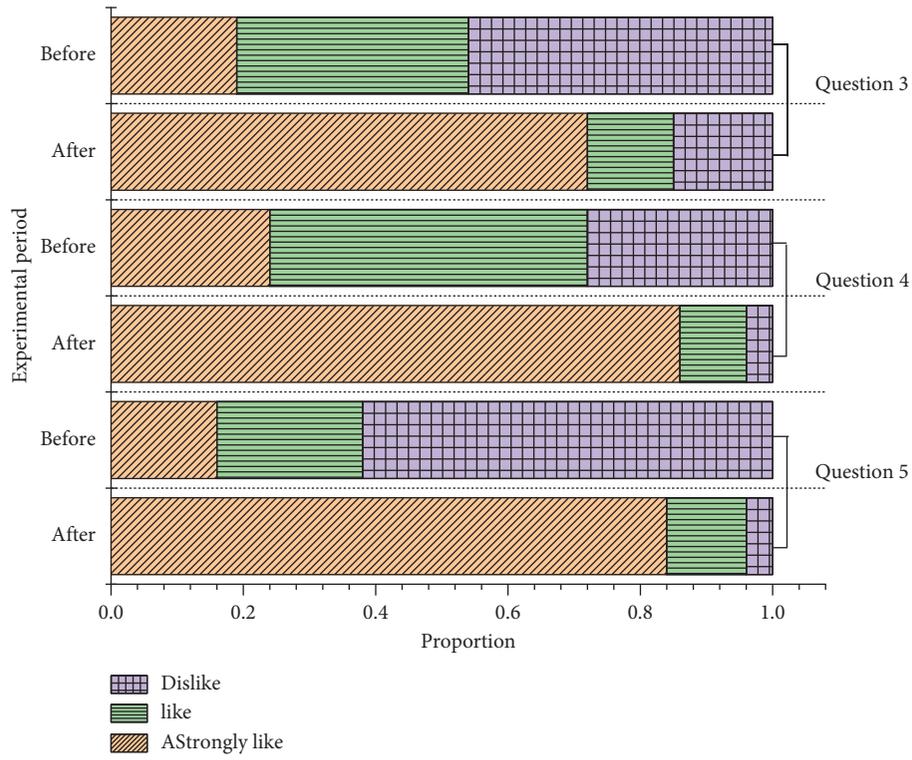


FIGURE 3: The attitude towards learning before and after the experiment.

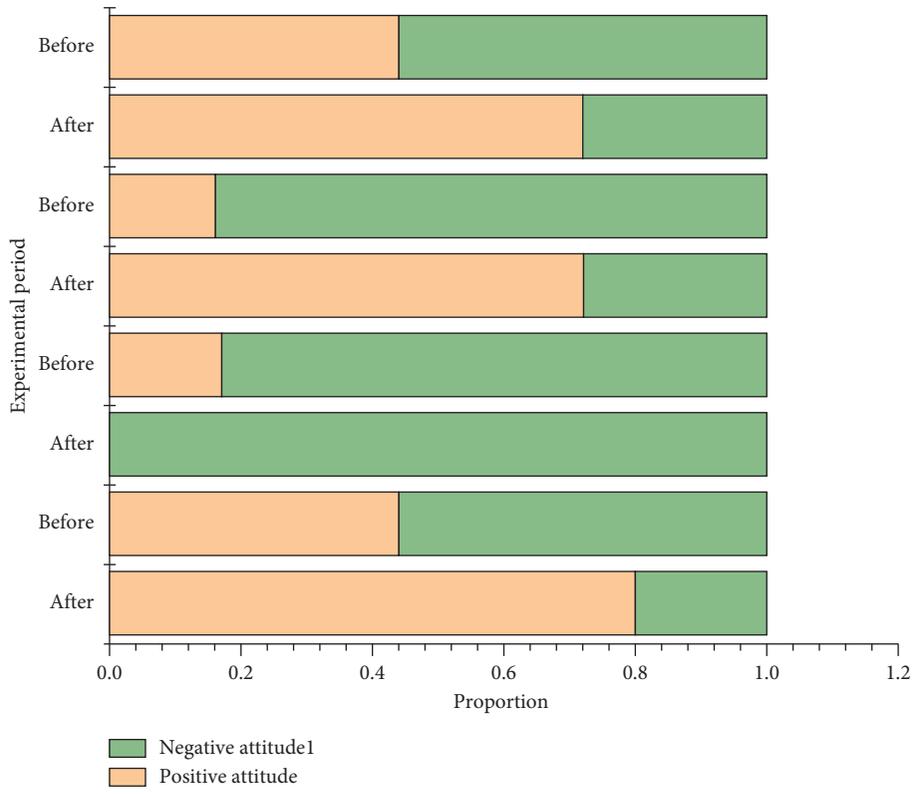


FIGURE 4: Learning methods experienced in the classroom.

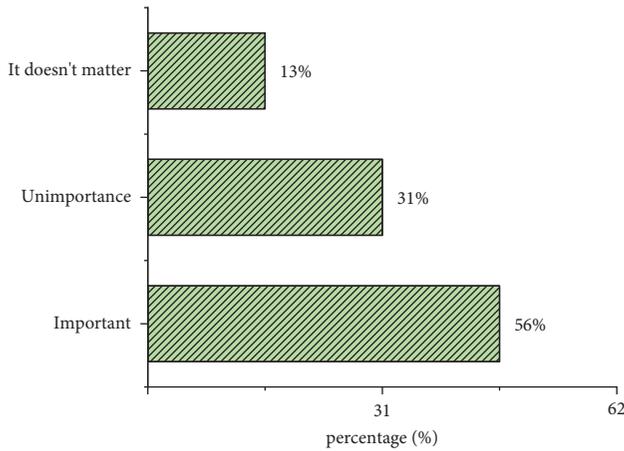


FIGURE 5: Teachers' awareness of game teaching.

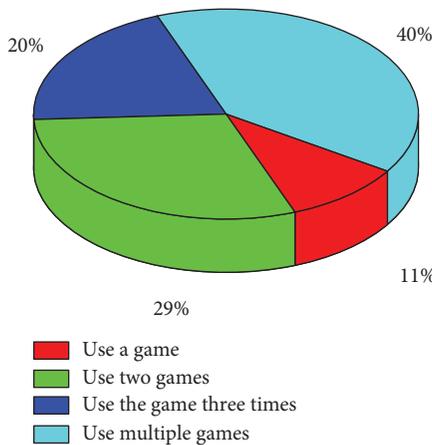


FIGURE 6: Number of games that preschool teachers can use in teaching.

Second, in the game teaching classroom, the safety of students should always be paid attention to.

The most important issue in children's teaching is safety. Therefore, in the specific organization and implementation of the game, attention should be paid to each child to ensure that the three most important points in the game are (safety, organization, fun, fairness).

Third, schools, teachers and parents need to work together.

Schools should reduce part of the burden on teachers, so that teachers have more time to design games and carry out game teaching classes. Teachers should maintain an active learning state, constantly improve themselves and innovate, and set up interesting, scientific, and safe excellent classroom models for students. Parents should actively cooperate with teachers and schools, and actively participate when they have the opportunity to cultivate students' learning ability and improve students' cognitive ability.

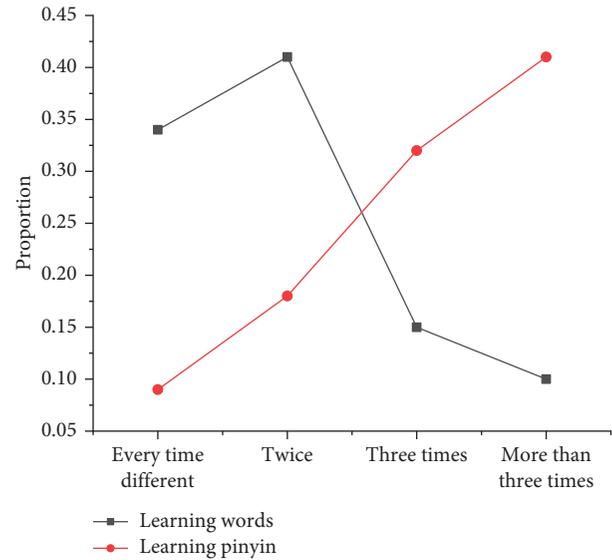


FIGURE 7: Frequency of game use in learning.

4.5. Discussion. Game plays an important role in children's learning process. It is meaning to carry out teaching work. The scientific and rational use of the teaching function of games can effectively improve the teaching level of kindergarten teachers, realize the purpose of the teaching plan, and make the children's body and mind fully develop. Currently, there is a way to explore the development of interactive PowerPoint game media (POPOIN) for children aged 4-6 in Jepara Regency Kindergarten [30]. Some opinions think that the educational resources in traditional Chinese culture should be fully tapped, the most classic and valuable content for children's education should be provided, and a good foundation for children's future development should be laid [31]. Teaching in games and learning in teaching is more inclined. The sublimation of children's teaching in the integration of game and learning is that children can enjoy game teaching, to obtain the effect of $1 + 1 > 2$.

In addition, children are in a critical period of growth. Through various forms of games, children can improve their physical fitness, and increase their physical activity and motor coordination. Because of the highly competitive and technical content of sports, it is popular with children. In many sports, running, jumping, crawling, throwing, and other forms can accelerate the blood and metabolism in children's bodies, so that their bodies can develop better [32]. In art activities such as painting, jigsaw puzzles, paper cutting, and folding, it is significant to cultivate children's hand flexibility, develop their fine motor skills, and exert their creative thinking abilities. [33]. However, many teachers do not know how to carry out creative teaching in the teaching process. Therefore, it is necessary to provide some guidance and assistance for teachers in teaching activities, broaden the breadth of knowledge for teachers and improve the quality of teaching.

5. Conclusion

5.1. Research Contributions. This research is a topic of discussion with practical significance. Game teaching has a great influence and positive effect on the healthy development of children's physique and cognitive ability. The contribution of the research is that in the teaching process, the use of game teaching can enable students to learn independently, interact, answer, and feedback happily, and find that children's learning ability has been greatly improved, and learning efficiency has also been greatly improved. Moreover, effective information can be obtained from the children's feedback to understand the students' learning situation, and through games, both teachers and students can join in the game teaching and experience the fun of teaching or learning. Through the colourful form of game classroom, some problems such as inactive participation of children and boring classroom machinery in traditional classrooms can be avoided. In today's world, with the continuous development of preschool education and growing importance, children's preschool play pedagogy is not only a teaching discussion of children's nature, but also a new attempt to a new round of "behaviour-centered" new curriculum reform [34].

5.2. Research Limitations. First, limited by geographical conditions, the number, and region of preschool education institutions observed in this study have certain limitations.

Second, from the research at home and abroad, game teaching is still in constant exploration and development. It still needs continuous learning to truly appreciate the benefits of game education on children's cognitive ability education.

Third, the first trial still has many flaws. First of all, in terms of the number of subjects in the experiment, only 100 people were selected, so the results of the experiment have certain limitations.

Fourth, it has only been carried out for more than two months. During these two months, the results and problems of the test have not been well reflected.

Fifth, the limitation of time and objective conditions, the author is also a beginner, lacking sufficient theoretical knowledge, and the breadth and depth of understanding and thinking about the problem are not enough.

5.3. Future Research. First, by promoting the teaching practice of the integration of games and teaching, the games and teaching can be more deeply integrated. But it is the challenges and difficulties faced by the integration of games and education that how to make game activities more connected with teaching and develop dynamically so that children can have a deep experience in games.

Second, for preschool teachers, these are urgent problems that the control of the traditional teaching model and the unknown of their teaching roles need to be solved. Not only that, in the face of children's safety and cohesion problems also to the implementation of game teaching increased the invisible pressure. Therefore, it is necessary to

reflect on the description and analysis of educational practice and further reflect on relevant issues.

Third, game teaching in China is likely to be limited by the traditional examination, making it very likely to deviate from the original intention. Therefore, the balance between games and teaching is very important.

Appendix

Questionnaire

- (1) Which is your class?
A. Class One B. Class Two
- (2) What is your gender?
A. boy B. girl
- (3) How do you like teaching games like this?
A. I like it very much B. I like it moderately C. I dislike it
- (4) Do you think this way of teaching is fun?
A. Yes, it is very fun B. It is not very fun C. No, it is not fun
- (5) Would you like to have a game teaching class every day?
A. Yes B. moderate C. No
- (6) Do you often raise your hand to answer questions in class?
A. Yes B. No
- (7) Can you get along better with your classmates
A. Yes B. No
- (8) Would you like to have a game teaching class every day?
A. Yes B. No
- (9) Do you feel dazed and distracted during class?
A. Yes B. No
- (10) Can you learn new and interesting knowledge?
A. Yes B. No
- (11) Do you want to participate in such an event next time?
A. Yes B. No

Data Availability

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethical Approval

This article does not contain any studies with human participants or animals performed by any of the authors.

Consent

Informed consent was obtained from all individual participants included in the study.

Conflicts of Interest

All the authors declare that they have no conflicts of interest.

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