

# The Effectiveness of Folk Sports Games into Kinesthetic Intelligence Curriculum in Senior Class of Kindergarten

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## Abstract

Yong children kinesthetic intelligence curriculum (KIC) is a new type of physical education curriculum which promotes the all-round development of children's physical fitness, intelligence and human ability. The purpose of this study is to determine the relationship between the application of folk sports games and the effect of KIC through the change of children's problem-solving ability. This study was conducted by quantitative method. Taking C Kindergarten in Hefei, Anhui Province, China as a sample, a quasi-experimental study was carried out in a real teaching situation and the relationship between variables was confirmed through the data differences between the experimental group and the control group. The pilot study was adopted in this study. After the formal experiment, SPSS was used for data independent sample T-test and paired sample T-test, and the relationship between the three variables was tested through data. Results after the application of folk sports games, the children's problem-solving ability and the effect of KIC were significantly improved. It can choose suitable folk sports games to be widely applied in the KIC.

## 1. Introduction

Kinesthetic intelligence is one of the multiple intelligences proposed by Howard Gardner. Gardner's theory suggests that human intelligence is diverse and includes various types such as linguistic intelligence, logical-mathematical intelligence, musical-rhythmic intelligence, bodily-kinesthetic intelligence, visual-spatial intelligence, interpersonal intelligence, intrapersonal intelligence, naturalistic intelligence, and existential intelligence. Bodily-kinesthetic intelligence, often referred to simply as kinesthetic intelligence, is the ability to use the whole body or parts of the body to solve problems or create products. This form of intelligence encompasses skills like balance, coordination, agility, strength, and speed, as well as motor characteristics and the ability to respond effectively to external stimuli. According to Anderson and Rumsey (2002), curricula that focus on developing kinesthetic intelligence can create a beneficial learning environment for learners who excel in this area. Such curricula harness students' energy and channel it into positive and constructive activities. For young children, specifically those aged 3-6, **kinesthetic intelligence Curriculum (KIC)** integrates physical development, intellectual training, and social learning. Designed to combine elements of sports, games, rhythm, life skills, and health, KIC aims to foster holistic growth in early childhood education (Zhong, 2020). KIC teaching model for young children is a new physical education concept that originated from Taiwan and was popularized in inland China (Zhang & Zhou, 2017). However, due to the lack of corresponding experience, teachers have deviations in grasping concepts, and the process of curriculum implementation is confused with the traditional physical curriculum, which does not fully reflect the part of intelligence and human ability and ignored the children's problem-solving ability (Zhong, 2020).

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Folk sports are often a reflection of the regional cultural environment and of the cultural identity and sense of belonging of the local people. Fundamentally, traditional folk sports are a sign of national identity. Among other things, folk sports games are pluralistic, unique and culturally diverse in the form of sports, which is not found in other media. However, in recent times, the rapid pace of globalisation and modernisation has greatly reduced this diversity and marginalised local, national and traditional folk sports around the world (Thomas, 2021). At the same time, folk sports games, created and spontaneously formed by the people, are traditional games or sports with certain rules and use physical movement to promote the all-round development of people's body and mind (Shen, 2013), recognized for its relevance in society and its ability to inculcate cultural values in children, were not given enough attention and are gradually forgotten (Addy, 2022). Rui (2022) pointed out that to respect and protect traditional culture and art, we should establish cultural awareness. Build a cultural atmosphere, so that young children grow up with the influence of national culture, thus cultivating their love for their hometown and motherland. Under such a continuous influence, our national spirit and traditional culture can be passed on from generation to generation, continue to develop, and improve the sense of identity with the country and the nation. Incorporating traditional culture into kindergarten curricula can promote the development of children's character and social qualities. The application of folk sports games and the development of kindergarten curricula with local characteristics make them more diversified, life-like and interesting. At present, folk sports games have been applied to regional activities, one-day activities, sports activities, health education curriculums, etc., but there were few studies on the application of KIC. Therefore, based on KIC teaching model in Taiwan, this research took folk sports games as a new curriculum content into KIC. Taking C kindergarten in Xinzhan District of Hefei City, Anhui Province, China as samples, experimental group and control group were set up with teaching experiment method. Through data analysis, we explored the impact of folk sports games on the young children's problem-solving ability in KIC and whether it can improve the effectiveness of KIC.

## 2. Literature Review

Folk sports games are defined as regional, folk or ethnic cultural ways of body movement, certain physical traditions that are part of the heritage of mankind and transmit cultural and universal values, which have been transmitted from generation to generation through physical acts (performances and competitions), regardless of changes in geographic location and socio-cultural status (Addy, 2022). Sallabas (2020) in a study on the functions of local folk games, it is stated that folk games have an important role in teaching various skills, while skills can be used in the social, educational and life of children. The notable functions of folk games are a source of entertainment, favouring the development of language and auditory skills, social learning skills and improved collaborative activities. Folk games have been recognised as fostering positive values in children's development. Among other things, folk sports games have unique motor values that promote fine motor development in young children. In addition, folk sports games also favour children's increased social sensitivity, where young children experience positive interactions between players (Ralibi, 2018). With modernisation, the Olympic Movement has gradually become the core of sports nationalism, while folk sports have been marginalised, outdated and inferior. Over the past decades, folk sports have been re-branded as intangible heritage (Thomas, 2021). Addy's (2022) study showed not only the gradual decline in the rate of participation in traditional games among many contemporary youths, but also the fact that folk sports and games had not been explicitly addressed in the context of academic research, signalling a serious oversight in past research. Folk sports and games must therefore be protected and promoted.

Gardner noted that body-kinesthetic intelligence required the potential to use a person's entire body or parts of the body (such as the hands or mouth) to solve problems or fashion products. Dancers, actors and athletes highlight this wisdom. At the core of kinesthetic intelligence is the ability to manipulate objects deftly and skillfully control one's body movements. An obvious area for the use of body-kinesthetic intelligence is physical education (April, 2003). Gardner (1983) from the perspective of multiple intelligences, physical education is closely related to kinesthetic intelligence. because it used sports or many other physical activities to promote healthy living, thereby benefiting students in life. In 1970, Professor Lin from Taiwan developed and put into practice the KIC proposed by Gardner's body-kinesthetic intelligence in Multiple Intelligences. This curriculum was a physical education and health curriculum designed for children aged from 3 to 8. Based on the unique teaching concept of "playfulness", it constructed a curriculum system including physical fitness, intelligence and human ability. The purpose was to enable children to get sufficient physical exercise, stimulate potential ability and flexible thinking, and cultivate moral cultivation and social adaptability (Lv&Dong, 2022). However, KIC is an emerging industry which has been put into the market for a short time without long-term teaching test, and lacks certain continuity and completeness in curriculum setting, curriculum plan and professional teaching materials (Lin, 2020). Zhong (2020) also pointed out that in recent years, many kindergartens were introducing KIC, but due to lack of experience, teachers were wrong in grasping concepts, and it was confused with traditional physical curriculum in implementation. The part that did not fully reflect intelligence and human ability also ignored the comprehensive development of children. Lv and Dong (2022) pointed out that the theoretical basis of KIC design

was very lacking at present, and the KIC system was unscientific and systematic, which need to be further standardized and improved in subsequent studies. Chinese researchers took many cities as examples to point out the problems existing in the current situation of KIC. Qin (2017) pointed out that the implementation of KIC in kindergartens in Jiangyou City was characterized by excessive randomness of goals, lack of systematisms and lack of scientific content and no corresponding content was scientifically formulated according to different ages of children. Lin (2019) pointed out that from the perspective of the teaching content of KIC in urban kindergartens in Datong City, there were only kinesthetic intelligence equipment teaching with a single content setting, which was not in line with the characteristics of diversified content of KIC, and was not conducive to the innovative development of physical intelligence teachers. Zhang (2017) took kindergartens in Xinyu city as the research object and pointed out that at present, KIC has begun to take shape, but there were still shortcomings in the number of class hours, venue equipment, curriculum content, teaching methods, teachers and other aspects. The lack of KIC quality in most kindergartens has affected the development status and effect of KIC in children to a certain extent. Yang (2013) took kindergartens in Changsha City as an example and pointed out that the content of KIC needs to be developed and the organizational form and teaching level of teachers need to be improved. Therefore, it is necessary to pay attention to the quality of KIC and continue to carry out research and exploration directions to improve the effect of KIC. Lin (2020) pointed out that especially in curriculum research and development, curriculum content is required to remain active and inject new vitality continuously. In order to avoid the inflexibility of teaching content, a special curriculum research group must be set up to provide follow-up guarantee for curriculum settings and improve teaching content. Through understanding the current situation of KIC in some cities of China and the cities where researchers were located, we were aware of many problems of KIC. Besides the macro problems, the micro questions mainly focus on the content of the curriculum. Yao (2020) pointed out that ethnic folk sports, as the main content of Chinese traditional excellent culture, should be developed in kindergarten education and LIC. This study took the content of KIC as the starting point to explore the application of folk sports games as the curriculum content in KIC. Liu (2019) said for the healthy development of children's body and minded the effective inheritance of traditional culture, it is an inevitable trend to apply folk sports games to kindergarten education activities. This direction has been proposed by some researchers, but few empirical studies have been conducted. Liu (2020) investigated the current situation of KIC in Hefei City and found that there were many common problems with the KIC in kindergartens as other cities in China. Therefore, this study took Kindergarten C in Hefei, Anhui Province, China as the research sample to carry out empirical research. The kindergarten ranked high in the Hefei kinesthetic intelligence activity competition, and its curriculum was typical and representative. Two senior classes in kindergarten C were selected as the research objects, the experimental group and the control group respectively. Through the analysis of experimental data, the relationship between the application of folk sports games and the effect of KIC was determined.

Gardner's Multiple Intelligences Theory was framed by the biological origins of problem-solving ability that were universal regardless of cultural context (Gardner, 1983). Problem solving was often defined as coming up with new answers rather than simply applying previously learned rules to create solutions. It is an inquiry task in which solvers explored solution paths to reach goals based on given information (Sue, 1994). As children learn and grow, problem-solving ability developed through natural interactions in the environment (Britz, 1993; Smith, 2003). Problem-solving ability were critical to a children's growth and success in a variety of environments (Lindsay, 2012). Ching (2010) pointed out that teachers should provide suitable observation tools, such as standardized scales and provide children with challenging curriculum to encourage their high thinking skills, problem-solving ability and the ability to develop other potentials. LV et al (2022) believed that kinesthetic intelligence, as a kind of intelligence, was the integration of behavioral ability and mental ability. Motor skills constitute the behavioral ability component of active intelligence, and the mental ability component should include higher cognitive functions such as problem-solving ability. Four researchers from the Key Laboratory of Adolescent Health Evaluation and Sports Intervention of the Ministry of Education and the College of Physical Education and Health of East China Normal University jointly developed " Three-level index scoring standard of kinesthetic intelligence evaluation index system for children aged 3-6 years old "Motor skills and problem-solving ability were taken as the core dimensions of kinesthetic intelligence evaluation index system for children aged 3 to 6. The three indexes of "attitude to problems, method to solve problems, quality of problem solving" are the secondary indexes of the dimension of problem-solving ability. Therefore, this study adopts " Three-level index scoring standard of kinesthetic intelligence evaluation index system for children aged 3-6 years old (problem-solving ability dimension)" as the evaluation scale to explore the influence of folk sports games on children's problem-solving ability, and then the effect of KIC, so as to improve the current situation of KIC.

### 3. Research Methodology

Quantitative research usually used to study causal relationship and could also be used to study the association or relationship between variables (Leslie, 2017). This study aimed to explore the relationship between folk sports games and KIC, adopted quantitative research. The quasi-experiment was an empirical intervention study that

approximates the basic impact of the intervention on the target population through non-random participation placement. Quasi-experiments were not only used to verify the reasons for pre-test and post-test in the medical field, but also to solve problems, they were also used in the field of education (Cook&Reichardt, 1979). Since educational experiments are conducted in real educational situations, random assignment was not always possible due to practical or ethical reasons. The researchers used experimental and control groups to control the effect of the test (John, 2019), so this study adopted an unequal group before and after test design.

#### 4. Research Instrument

Two teachers, as bystanders, objectively observed and scored the behavior of children's problem-solving ability in the experimental group and the control group, and determined the influence of folk sports games on the KIC effect through the changes in problem-solving ability. If the application of folk sports games into KIC can improve children's problem-solving ability, it proves that folk sports games can improve the KIC effect and vice versa. The measurement of children's problem-solving ability adapted LV et al., (2022) "Three-level index scoring standard of kinesthetic intelligence evaluation index system for children aged 3-6 years old (problem-solving ability dimension)". Problem-solving ability was divided into three dimensions. Among them, the attitude of facing problems referred to the individual can actively look for solutions when encountering problems, which is manifested by active participation in activities and the courage to take responsibility. The methods of problem-solving referred to the ability to proactively seek solutions and act, either by actively seeking help or cooperating with others to complete tasks. The quality of problem-solving referred to the ability to solve problems reasonably and effectively, which is manifested by the effectiveness, diversity and creativity of the methods adopted. Each dimension is divided into five levels, as detailed in Table 1.

**Table 1** Scoring criteria for the three-level indicators of the kinesthetic intelligence evaluation index system for 3- to 6-year-old children (problem-solving ability dimension)

Tertiary indicators	Marking scheme
C15 Participation in play activities	Willingness to Participate. Takes initiative and accepts responsibility (5 points); takes initiative (4 points); participates in supportive activities (3 points); participates in supportive activities with guidance (2 points). Supportive activities (2 points); no willingness to participate or perfunctory participation (1 point).
C16 Seeks help or cooperates with peers	Coordinates and organizes others to complete tasks (5 points); works with others to complete own tasks (4 points); performs tasks independently, seeks help or communicates with peers. Seeks help or interacts with peers (3 points); performs task alone without interaction (2 points); participates blindly without understanding the requirements of the task (1 point).
C17 Diversity and creativity of outcomes	Adopting more than 3 methods to accomplish the task and the methods are creative (5 points); adopting 3 or more methods to accomplish the task and the methods are somewhat creative (4 marks). (5 points); 3 or more methods to accomplish the task with some creativity (4 points); 3 methods to accomplish the task (3 points); 2 methods to accomplish the task (2 points); no task accomplished (1 point)

The questionnaire is a procedure for obtaining specific data that can be quantified by asking a series of questions of the person concerned. It is often used to assess a person's feelings, thoughts, and opinions (Addy, 2022). In order to ensure that children like or dislike folk sports games, this study adopted Shen (2013)'s "Early Childhood Emotional Rating Scale", and the children were asked to complete the questionnaire according to their likes and dislikes which fit the binary scale in the non-scale questionnaire. In order to facilitated children's understanding, the form of pictures was used to replace the options (smiley face - like, crying face - dislike). The meaning of the pictures would be informed to children in advance, and the frequency statistics would be carried out according to children's choices. If the frequency of children's likes is high, It proves that it is feasible for folk sports games to integrate KIC, as detailed in Table 2.

**Table 2** *Early childhood emotional rating scale*

Option	Like	Unlike
		

In order to test the reliability and validity of the scale and whether children understood the questionnaire, this study selected A kindergarten with representative kinesthetic intelligence activities in the same city, randomly selected 10 children in a senior class, and carried out a pilot study. During the experiment, children's performance behavior was observed, and adapted scale "Three-level index scoring standard of kinesthetic intelligence evaluation index system for children aged 3-6 years old (problem-solving ability dimension)" to grade. After data collection, SPSS 27.0 was used to analyze the reliability of the scale as a whole and its three dimensions. The results showed that the Cronbach alpha value was 0.863, far greater than 0.5, indicating a good and acceptable use intensity range. The KMO value was 0.736 and the Bartlett sphericity test p value was 0.001, indicating that the reliability and validity of this observation scale was high, indicating that the scale was feasible. After the pilot study, the non-scale questionnaire "Early Childhood Emotional Rating Scale" was used to conduct a questionnaire survey on children's emotional attitude. Finally, it was determined that all 10 children made matching choices according to their likes or dislikes, with a consistent rate of 100%, and all 10 children chose "like". It is confirmed that children can understand the content of the questionnaire and make choices according to their emotions, and it is confirmed that the questionnaire is feasible. Through the pilot study, the feasibility of the research tool was confirmed.

## 5. Result

The quasi-experimental subjects of this study had a representative and typical kinesthetic intelligence activity. There were 2 senior classes of children randomly selected from C Kindergarten in Xinzhan District, Hefei City, Anhui Province, China, with 30 children in each class, a total of 60 children. The pre-test, post-test and 8-week KIC teaching tests were carried out, for a total of 10 weeks. Pre-test and post-test use the same content - kinesthetic intelligence activity - small sandbag. One class was the experimental group, applying folk sports games, the other class was the control group, applying normal physical content of KIC. According to the teacher interview and course inquiry before the experiment, the two classes did not systematically carry out the teaching of folk sports games. The two teachers scored the behavioral performance of the three dimensions of children's problem-solving ability on the corresponding observation scale of the two groups of children. By observing the changes and differences in the problem-solving ability of the two groups of children, the influence of the application of folk sports games on children's problem-solving ability and the effect of KIC was determined.

### 5.1 Comparison of Problem Solving Ability Between The Experimental Group and The Control Group Before the Experiment

**Table 3** *Independent sample T-test of problem-solving ability of pre-test experimental group and control group*

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Participation in play activities	Equal variances assumed	4.295	.043	-1.113	58	.270	-.2000	.1797	-.5596	.1596
Seeks help or cooperates with peers	Equal variances assumed	2.849	.097	-.183	58	.856	-.0333	.1825	-.3987	.3320
Diversity and Creativity of Outcomes	Equal variances assumed	.760	.387	-.869	58	.388	-.1500	.1726	-.4954	.1954

Problem-solving ability	Equal variances assumed	2.474	.121	-.810	58	.421	-.3833	.4732	-1.3306	.5640
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Before the experiment, the independent sample T-test was conducted on the scores of problem-solving abilities of the two groups of children. As can be seen from Table 3, Three-dimensional participation in play activities (sig 0.270 > 0.05), seeks help or cooperates with peers (sig 0.856 > 0.05), There was no significant difference in diversity and creativity of outcomes (sig 0.388 > 0.05) and overall Problem-solving ability (sig 0.421 > 0.05). Therefore, it can be considered that before the formal experiment, there was no significant difference in problem solving ability between the two groups of children, and they were equal groups of subjects.

### 5.2 Comparison of Problem Solving Ability Between Experimental Group and Control Group After Experiment

**Table 4** Independent sample T-test for problem solving ability of the post-test experimental group and the control group

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Participation in play activities	Equal variances assumed	.944	.335	6.993	58	.000	1.3833	.1978	.9874	1.7793
Seeks help or cooperates with peers	Equal variances assumed	.139	.711	6.942	58	.000	1.3667	.1969	.9726	1.7607
Diversity and Creativity of Outcomes	Equal variances assumed	.290	.592	6.415	58	.000	1.2667	.1974	.8714	1.6619
Problem-solving ability	Equal variances assumed	.031	.861	7.428	58	.000	4.0167	.5408	2.9342	5.0991

From Table 4, in participation in play activities, seeks help or cooperates with peers, diversity and creativity of outcomes, as well as overall Problem-solving ability, were significantly different between the two groups (p < 0.001). Therefore, it could be considered that the children's problem-solving ability in the experimental group was significantly better than that in the control group after the experiment. In other words, compared with the normal content of KIC, the applying folk sports games in KIC can effectively promote the development of children's problem-solving ability.

### 5.3 Comparison of Problem Solving Ability of Children in Experimental Group Before and After The Experiment

**Table 5** Paired sample *T*-test of pre-test experimental group

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Participation in play activities (pro-test) - Participation in play activities (post-test)	-2.0667	.8782	.1603	-2.3946	-1.7387	-12.889	29	.000
Pair 2	Seeks help or cooperates with peers (pro-test) - Seeks help or cooperates with peers (post-test)	-1.9667	.7184	.1312	-2.2349	-1.6984	-14.994	29	.000
Pair 3	Diversity and Creativity of Outcomes (pro-test) - Diversity and Creativity of Outcomes (post-test)	-1.9333	.7849	.1433	-2.2264	-1.6402	-13.491	29	.000
Pair 4	Problem-solving ability (pro-test) - Problem-solving ability (post-test)	-5.9667	2.0254	.3698	-6.7230	-5.2104	-16.135	29	.000

From Table 5, the score of problem-solving ability of the experimental group in the post-test was significantly higher than that in the pre-test, and there were extremely significant differences in all dimensions of problem-solving ability ( $p < 0.01$ ). It showed that the children's problem-solving ability has been significantly improved after the 8 weeks KIC teaching with folk sports games.

### 5.4 Comparison of Children's Problem Solving Ability Between Control Group and Experimental Group Before and After Experiment

**Table 6** Paired samples statistics of pre and post-test control group

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Participation in play activities (pro-test)	2.317	30	.7598	.1387
	Participation in play activities (post-test)	2.800	30	.8158	.1489
Pair 2	Seeks help or cooperates with peers (pro-test)	2.017	30	.8251	.1506
	Seeks help or cooperates with peers (post-test)	2.567	30	.7958	.1453
Pair 3	Diversity and Creativity of Outcomes (pro-test)	1.667	30	.6989	.1276
	Diversity and Creativity of Outcomes (post-test)	2.167	30	.8023	.1465
Pair 4	Problem-solving ability (pro-test)	6.000	30	2.0469	.3737
	Problem-solving ability (post-test)	7.533	30	2.2047	.4025

**Table 7** Paired samples statistics of pre and post-test experimental group

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Participation in play activities (pro-test)	2.117	30	.6254	.1142
	Participation in play activities (post-test)	4.183	30	.7130	.1302
Pair 2	Seeks help or cooperates with peers (pro-test)	1.983	30	.5645	.1031
	Seeks help or cooperates with peers (post-test)	3.950	30	.7468	.1364
Pair 3	Diversity and Creativity of Outcomes (pro-test)	1.517	30	.6363	.1162
	Diversity and Creativity of Outcomes (post-test)	3.450	30	.7352	.1342
Pair 4	Problem-solving ability (pro-test)	5.617	30	1.5903	.2903
	Problem-solving ability (post-test)	11.583	30	2.0132	.3676

For obvious contrast effect, descriptive analysis and comparison were made between the pre and post-test data of the children’s problem-solving ability in the control group and the experimental group. According to the average of all dimensions before and after the experiment of the two groups in Table 6 and Table 7, although the scores of all dimensions and the total problem-solving ability of the control group also improved, the differences were not large. In conclusion, the control group did not significantly improve the development of children's problem solving level by taking the routine KIC, while the experimental group significantly improved the scores of all dimensions and the total problem solving ability.

## 6. Conclusion

This study determined the relationship between folk sports games and KIC through empirical research data. Based on the small difference in children’s problem-solving ability between the pre-test experimental group and the control group, the experimental group applied folk sports games and the post-test data showed that the children's problem-solving ability was significantly higher than that before the experiment and also significantly higher than that of the control group. It indicated that the application of folk sports games in the KIC was conducive to improving children's problem-solving ability. The problem-solving ability, as the external "physical expression" of the evaluation of kinesthetic intelligence development (Addy, 2022), was also the teaching goal of the curriculum, and the realization of its goal and improvement of ability. It was fully proved that the application of folk sports games was also conducive to improving the effect of KIC.

Because this study only selected 8 types of folk sports games suitable for children in senior classes, after the study, the kindergarten can further expand the age range of children, and select more folk sports games suitable for different ages and different types to be applied to the KIC for further research.

Folk sports games were expressive culture rooted in the cultural background of an ethnic group, which has important identifiable value and significance and was a sign of national identity (Thomas, 2021). Therefore, the government, kindergartens and teachers should create opportunities for children to inherit excellent traditional culture, increase the education of traditional culture in children's teaching and publicity of traditional culture in daily life, and make excellent folk sports games continue to spread.

Problem-solving is the basic ability of human development and progress. From the perspective of children's psychological growth, problem solving ability is the key skill for children's mental growth and social adaptation. Teachers attach importance to the cultivation of children's problem-solving ability. Teachers actively create challenging problem situations for children, encourage them to face and solve problems, and find appropriate ways to solve problems, so as to cultivate children's habit and ability to analyze problems.

At the same time, through the current literature research, there are still many macro and micro problems in the KIC, which affect the effect of the KIC. This study only takes the content of the physical intelligence course as the micro-perspective. In order to better improve the effect of the KIC, more researchers need to conduct more in-depth research.

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## Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

## Author Contribution

**Wanqin Gao conducted the study, composed, and edited the article. Wan Hanim Nadrah binti Wan Muda oversaw the research advancement, directed the review, modifications, and endorsed the article submission.**

## References

- Anderson, A., & Rumsey, R. (2002). Channeling energy using bodily-kinesthetic intelligence: Helping children with ADHD. *Physical & Health Education Journal*, 68(3) Retrieved from <http://search.proquest.com/docview/214324269?accountid=14771>
- Addy, P,M, Z. (2022). *The Preservation of Malaysian Traditional Sport and Games through Design*.Lancaster University:PHD Thesis.
- April, C.R. (2003).*Bodily-Kinesthetic Intelligence as praxis:a test of its instructional effectiveness*. University of New York:PHD thesis.
- Addy, P,M, Z. (2022). *The Preservation of Malaysian Traditional Sport and Games through Design*.Lancaster University:PHD Thesis.
- Britz, J. (1993). *Problem solving in early childhood classrooms*. Eric Digest. Retrieved from ERIC Database (ED 355040).
- Ching-Chih, K., June, M., Fang-Liu, S., &Chun, H. (2010). Identifying young gifted children and cultivating problem solving abilities and multiple intelligences.*Learning and Individual Differences*, 20,365–379.
- Cook, T. D., & Reichardt, C. S. (1979). Qualitative and quantitative methods in evaluation research. *Newbury Park: Sage*.
- Donald, B, J.(2019). Bodily-Kinesthetic Intelligence and Dance Education : Critique, Revision, and Potentials for the Democratic Ideal.*The Journal of Aesthetic Education*, 43(1),59-76.
- Gardner, H. (1983). *Frames of mind,the theory of multiple intelligences*. London : Heinemann,205-417.
- Gardner, H. (1983). *Frame of Mind: The theory of multiple intelligences*. New York: Basic Books.
- Gardner, H. (2008). *Reconstructing Multiple Intelligences*. Shen Zhixiang, trans. Beijing: China Renmin University Press.
- John, R.& Andrea, R. (2019). Experimental and quasi-experimental designs. *The Routledge Handbook of Research Methods in Applied Linguistics*,133-143.
- Liu, J. Z. (2019). *Action research on the application of traditional sports games in kindergarten education activities*. Changchun Normal University: Master's Thesis.
- Lv, H. M., & Dong, C.X. (2022). Dynamics, Hot Spots and Trends of Kinesthetic Intelligence Research in China - A Knowledge Mapping Analysis Based on CNKI and Wanfang Data (1990 - 2021) *Journal of Jilin Institute of Physical Education and Sports Vol. 38(1)*,8-16.
- Lin, Y.Y. (2020). Current situation and countermeasures of children's kinesthetic Intelligence curriculum from the perspective of SWOT analysis. *Sichuan Sports Science*, 39(4), 164-167.
- Lin, Z.Y. (2019). *Research on the current situation of kinesthetic intelligence program development in kindergartens in Datong urban area*. Inner Mongolia Normal University: Master's Thesis.
- Liu, X. (2020). Investigation and analysis of the current situation of kinesthetic intelligence curriculum in Chaohu Urban Kindergarten. *Boxing and fighting*,7.
- Leslie, C.S. (2017). Quantitative Research Designs:Experimental, Quasi-Experimental,and Descriptive.*Jones & Bartlett Learning,LLC*,155-183.
- Qin, L. (2017). Analysis of the current situation and countermeasures of the kinesthetic intelligence curriculum into kindergartens--Taking Jiangyou City as an example. *Journal of Jiamusi Vocational College*,(11),256.
- Rui, Z. (2022). Discussion on the Value of Integration Traditional Culture Into Kindergarten Curriculum ---Take Wuhu Iron Painting Technology as an Example. *Journal of Education and Development*.6(3),53-57.

- Ralibi, R. (2018). Designing a mobile game based on the folk game 'DODOMBAAN' to build social interaction between players. *Serat Rupa Journal of Design*, 1(2). <https://doi.org/10.28932/srjd.v1i2.457>.
- Sue, T. (1994). *The Relationship of Multiple Intelligences to the Instructional Process*, University of California, Riverside:PHD Thesis.
- Smith, D. C. (2003). Problem solving as an element of developmental well-being,321-330.
- Shen, X.F. (2013). *Research on the integration of folk sports games into kindergarten physical education*, Fujian Normal University: Master's thesis.
- Thomas, F. (2021). *Endangered Species of the Physical Cultural Landscape: Globalization, Nationalism, and Saf Globalization, Nationalism, and Safeguarding Traditional Folk Games*. The University of Western Ontario: PHD thesis.
- Tsvetkov, Y. (2020). Game Genesis of Justice in the Teachings of Huizinga. *Theory and history of the state and law*.7(1), 59-63. <https://doi.org/10.17816/RJLS34145>
- Yang, Z.X. (2013). *Survey and analysis of the current situation of the development of early childhood Kinesthetic intelligence program - Taking Changsha City as an example*. Hunan Normal University: Master's Thesis.
- Yao, R. (2020). *Xiangxi Kindergarten "kinesthetic intelligence curriculum" Research on National Folk Sports Resources Development*, Jishou University: Master's thesis.
- Zhang, S., & Zhou, P. L. (2017). The characteristics of Asia-Pacific kinesthetic intelligence curriculum and its implications for kindergarten physical Education. *Early Childhood Education (Educational Science)*. (1, 2), 33-35.
- Zhong, X. J. (2020). *Optimization of the Teaching Mode of Kindergarten kinesthetic intelligence curriculum*, Hebei Normal University: Master's Thesis.
- Zhang, L.J. (2017). *Research on the promotion of physical intelligence curriculum for children in Xinyu City*. Jiangxi Normal University: Master's thesis.