

Construction and Implementation of a Three-Tier and Three-Dimensional Curriculum System for Primary School Football Games under the Background of Sunshine Sports

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Abstract: Against the backdrop of the "health first" educational philosophy and the comprehensive promotion of "sunshine sports activities," school football has become an important tool for the reform of primary school physical education. However, current primary school football teaching generally suffers from problems such as monotonous content, monotonous forms, low student participation, and a lack of systematic curriculum, which seriously restricts the popularization and development of school football. This paper first reviews the current research status of gamified teaching of primary school football at home and abroad and analyzes the shortcomings of the existing curriculum system; secondly, it constructs a "three-stage, three-dimensional" primary school football game activity curriculum system, which includes three stages of "basic cognition - skill mastery - comprehensive application" and three dimensions of "knowledge dimension - skill dimension - literacy dimension"; finally, through a one-year teaching experiment, the implementation effect of the curriculum system is verified. The experimental results show that students in the experimental class using the "three-stage, three-dimensional" curriculum system scored significantly higher than those in the control class on all four assessment indicators. The largest gap is in the sports interest score, with a difference of 31 points. This indicates that the three-dimensional curriculum system that incorporates gamification can greatly reverse students' resistance to football classes, fully mobilize their enthusiasm for participation, and provide a practical model that can be learned from for the reform of primary school football teaching.

Keywords: Primary School Soccer; Gamified Learning; Curriculum Development; Action Research Method

1. Introduction

With the successive promulgation of policy documents such as the "Opinions on Comprehensively Strengthening and Improving School Sports in the New Era" and the "Basic Requirements for National Youth Campus Football Reform Experimental Zones," campus football has risen to the level of a national strategy, becoming an important way to implement the fundamental task of fostering virtue and cultivating talent, and to cultivate socialist builders and successors who are well-rounded in moral, intellectual, physical, aesthetic, and labor education. The core goal of the "Sunshine Sports Movement" is to enable every student to participate in sports activities, enjoy the fun of sports, improve their physical health, and cultivate a lifelong awareness of physical activity. It could be argued that football has tremendous potential to teach qualities such as determination and community through its status as the world's most popular sport; however, there is substantial evidence to suggest that there are still many substantial issues relating to the delivery of effective instruction in football lessons at the primary level of education. For instance, the results could also potentially indicate that most primary schools continue with a traditional model of delivery (e.g., teacher demonstration - student imitation). Many teachers therefore base their instruction upon what is referred to as technical standardization; this approach does not always take into consideration the physical development and maturity levels of the students involved in football lessons. The curriculum outcomes appear to be very disjointed and non-systematic, while student assessment methods often emphasize student performance over process. There also appears to be very little uniformity with regard to skill development across the grades. Furthermore, the significant findings could support the notion that the aforementioned issues have led to the development of a fear of football amongst students, creating a situation in which many students

enjoy football as a game, but do not enjoy learning how to play football in physical education class. This situation is likely the opposite of the initial intention of the objectives of the Sunshine Sports Movement. Therefore, it seems evident that this disconnection represents a major concern for primary football educators. Based on the results, it might also be concluded that the successful resolution of these issues requires the implementation of a comprehensive curriculum in accordance with developmental principles. In light of these potential concerns, it may also be possible that gamification could provide solutions to many of the previously discussed issues related to football instruction at all levels. Research indicates problems undermine education objectives.

This paper may suggest that students in grades 1-6 of primary school require a "three-tiered, three-dimensional" curriculum system that conforms to physical and mental development patterns. Given that the evidence demonstrates this gap exists, the results could indicate that such a system must reflect the characteristics of football while integrating gamified teaching concepts. Moreover, the significant findings may suggest that its effectiveness should be verified through teaching practice across multiple curriculum dimensions. Therefore, the study could demonstrate that the research scope covers curriculum objectives, curriculum content, teaching methods, evaluation methods, and implementation guarantees. Study covers multiple curriculum dimensions. Furthermore, the key evidence may suggest that the theoretical significance of this paper lies in enriching research on primary school football curriculum systems. In light of these findings, the results could indicate that this work provides a new perspective for the application of gamified teaching in physical education. However, the important evidence may suggest that the practical significance lies in providing an operable implementation plan for primary school physical education teachers. Given that the study demonstrates these needs exist, the findings could indicate that this approach may help improve teaching quality, stimulate students' interest in sports, and promote the popularization of campus football. Paper addresses theory and practice.

The analysis in this paper appears to be grounded in constructivist learning theory, gamified learning theory, multiple intelligences theory, and the "Compulsory Education Physical Education and Health Curriculum Standards (2022 Edition)". Moreover, the significant findings may suggest that constructivist learning theory posits that learning could demonstrate a process in which learners actively construct knowledge, emphasizing the key role of learner subjectivity and contextuality. Furthermore, gamified learning theory may indicate that integrating game elements into the teaching process could establish engaging learning environments to stimulate learners' intrinsic motivation. In light of these theoretical foundations, multiple intelligences theory might suggest that everyone possesses multiple intelligences, and the evidence could indicate that education should respect individual differences to promote students' all-round development. Theory links curriculum standards. The "Compulsory Education Physical Education and Health Curriculum Standards (2022 Edition)" may suggest that the results could demonstrate a need to "emphasize the gamification and fun of teaching content to stimulate students' learning interest" and to "construct a scientifically sound and reasonable curriculum content system." Additionally, the significant evidence appears to support that these theoretical frameworks might indicate a coherent basis for examining how the key principles could influence the design of physical education curricula. Thus, the important findings may suggest that the study could establish that these frameworks appear to align with the critical goals outlined in the curriculum standards. Notwithstanding the diversity of these theoretical perspectives, the results might indicate that each framework could contribute important evidence toward a comprehensive understanding of learner engagement and development.

This paper aims to address the following three key issues: First, how to scientifically divide primary school football game activities into stages and dimensions based on the physical and mental development characteristics of primary school students and the laws of football; second, how to design football game activities that meet the requirements of different stages and dimensions to achieve the coordinated development of knowledge, skills and literacy; and third, how to establish a scientific and effective curriculum implementation guarantee system and evaluation system to ensure the achievement of curriculum goals.

The innovations of this paper are mainly reflected in two aspects: First, theoretical innovation, which proposes for the first time a "three-dimensional" primary school football game activity curriculum system framework, dividing primary school football teaching into three progressive stages and three interrelated dimensions, realizing the systematization and structuring of curriculum content; Second, practical innovation, which develops more than 120 football game activity cases suitable for different grades, forming a complete curriculum implementation plan and evaluation system, which has strong operability and promotion value.

The technical solution of this paper is as follows: First, a literature review is used to systematically review relevant research results on primary school football teaching and gamified teaching at home and abroad, providing a theoretical basis for this paper. Second, interviews and questionnaires are used to understand the current status and existing problems of primary school football teaching, and to solicit opinions and suggestions from front-line physical education teachers and education experts. Third, based on the above research, a "three-tiered, three-dimensional" primary school football game activity curriculum system is constructed, including curriculum objectives, curriculum content, teaching methods, and evaluation methods. Then, an action research method is used to conduct a one-year teaching experiment in two parallel classes in a primary school. The experimental class is taught using the "three-tiered, three-dimensional" curriculum system, while the control class is taught using the traditional teaching model. Finally, by comparing and analyzing the football skill level, physical fitness, sports interest, and teamwork ability of the students in the two classes, the implementation effect of the curriculum system is verified, and the curriculum system is further improved and optimized based on the experimental results.

2. Related Work

Under the background of Sunshine Sports, scholars at home and abroad have conducted rich research on curriculum system construction, gamified teaching and the educational value of football. Hjgaard et al. [1] took Danish schools as a case study and explored the construction path of two-dimensional curriculum in ability cultivation, providing a theoretical reference for the structured design of curriculum system. Zhang et al. [2] constructed a "three-dimensional" curriculum system for the development of children's motor skills, and carried out teaching design from the three dimensions of knowledge, skills and literacy, but their research object was the kindergarten stage and had not yet been extended to the field of primary school football. Li [3] proposed the theoretical framework of the "six-dimensional" curriculum system of sports major under the background of teacher education certification, emphasizing the systematic nature of the curriculum and the diversity of evaluation. Jinjin et al. [4] introduced the confrontation game teaching method into the primary school football classroom and verified the positive role of gamified teaching in skill improvement, but did not involve the overall construction of the curriculum system. Maojie et al. [5] confirmed from the psychological perspective that football training has a significant impact on the five personality traits of primary school students and revealed the deep educational value of football. Yang et al. [6] paid attention to the current situation of football activities in rural primary and secondary schools, pointed out that venues and teachers are restrictive factors, but did not propose a systematic solution. Nolan et al. [7] studied the holistic education behavior of primary school community football coaches, emphasizing that life skills training should be integrated into football teaching, providing a basis for the design of literacy dimensions. Jia[8] and Zhang[9] explored the implementation effect of the Sunshine Sports concept in colleges and universities from the perspectives of Taekwondo teaching and fuzzy comprehensive evaluation, respectively, and verified the feasibility of integrating Sunshine Sports into specialized teaching. Wang[10] proposed a path to integrate Sunshine Sports with mental health education under the background of the new curriculum reform, which expanded the educational boundaries of physical education courses. In summary, although existing research has accumulated certain achievements in curriculum dimension design, gamified teaching, and integration of Sunshine Sports, there are still obvious shortcomings: First, most studies focus on a single dimension or a single stage, and lack systematic research on integrating "multi-stage + multi-dimensional" into a complete curriculum system; second, gamified teaching is mostly used as an auxiliary means and has not yet risen to the underlying logic of the curriculum system; third, the construction and empirical verification of the "three-level three-dimensional" system for primary school football is almost blank, especially in the context of Sunshine Sports, research on using game activities as the core carrier to achieve the three-dimensional linkage of skills, literacy, and morality is still lacking, which is the core problem that this paper intends to solve.

3. Method

3.1 Theoretical Framework Construction of the "Third-Order, Three-Dimensional" Curriculum System

The research indicates there is a primary school football game activity curriculum system with two main elements: 'Three Stages of Teaching' and 'Three Dimensions of Skill Development'. In addition,

results suggest that grades one through six will utilise three progressive teaching phases determined by their age/cognitive level. First Stage (Basic Cognitive)- grades 1-2 is thought to provide students with an interest in playing football by Building Basic Knowledge and Basic Movement Skills. Therefore, Second Stage (Skill Mastery) - grades 3-4 were found to systematically develop the Basic Techniques of playing football, Simple Tactical Coordination, and Improvement in Fitness Levels. Final Stage (Comprehensive Application, Grades 5-6): Students are expected to apply football skills in competitive match scenarios, flexibly and accurately implement previously learned techniques and tactics during games, demonstrate teamwork competencies, and develop positive competitive awareness. The research shows a progression of these three stages follows an outline of the educational principle of Progressive Development from Simple to Complex. As such, the results suggest that the Evidence supporting the theory of progressive teaching suggests a systematic approach to the curriculum will support the Developmental Progression of the Students involved with this Programme. Thus, Progression of the Curriculum, as documented in evidence of all Stages, will support the principle of progressive teaching:

$$S=S_1 \rightarrow S_2 \rightarrow S_3 \quad (1)$$

In the formula, S represents the overall teaching system of primary school football; S_1 is the basic cognition stage, S_2 is the skill mastery stage, and S_3 is the comprehensive application stage. The three stages are progressively and connected in a one-way manner, realizing a complete teaching loop from interest enlightenment in the lower grades to comprehensive application in the higher grades [11]. "Three dimensions" refers to the fact that each teaching stage includes three interrelated developmental dimensions: knowledge dimension, skill dimension and quality dimension. The knowledge dimension mainly includes basic common sense of football, competition rules, safety knowledge, etc.; the skill dimension mainly includes basic football techniques (such as dribbling, passing, shooting, defense, etc.) and physical qualities (such as speed, strength, endurance, agility, etc.); the quality dimension mainly includes willpower, team spirit, competitive awareness, rule awareness, etc. The three dimensions permeate each other, promote each other, and empower each other to form a complete curriculum education goal system. The three-dimensional integrated education formula is as follows:

$$T = K + S + Q \quad (2)$$

In the formula, T represents the comprehensive educational effect of single-stage football teaching; K represents the educational effect of knowledge dimension; S represents the educational effect of skill dimension; Q represents the educational effect of quality dimension. The three are coupled with each other and are indispensable, jointly supporting the implementation of teaching objectives at each stage. The three dimensions permeate and promote each other, forming a complete curriculum objective system. In the "three-stage three-dimensional" curriculum system, each stage has clear objective requirements and corresponding game activities for the three dimensions. As the stages progress, the three-dimensional educational objective requirements gradually increase, and the difficulty and complexity of the game activities also increase simultaneously. The three-dimensional educational effects of each stage are superimposed and upgraded, forming a spiral upward and layer-by-layer quality improvement curriculum content structure and educational system [12].

3.2 Design and Development of Football Game Activities

According to the framework of the "three-level three-dimensional" curriculum system, this article follows the principles of "interesting, educational, safe, and hierarchical" to design and develop more than 120 football game activity cases suitable for different stages and different dimensions. The game content is strictly adapted to the third-order teaching gradient to achieve layered, classified, and adaptive design. The game stage adaptation formula is as follows:

$$G_{total}=G_1+G_2+G_3 \quad (3)$$

In the formula, G_{total} represents the total number of football game cases; G_1 represents fun ball games in the basic cognitive stage; G_2 represents technical practice games in the skill mastery stage; and G_3 represents competitive games in the comprehensive application stage. These three categories of games are tiered and progressively increase in difficulty, fully covering the teaching needs of all primary school stages. In the basic cognitive stage, games focused on "playing with the ball" are designed, such as "Baby Football Finds Mom," "Little Ants Carrying Grain," and "Little Shooting Expert," allowing students to become familiar with the ball and cultivate an interest in football in a relaxed and enjoyable way. In the skill mastery stage, games focused on "practicing the ball" are designed, such as "Dribbling Relay," "Passing and Target Practice," and "One-on-One Offense and

Defense," allowing students to master basic football techniques through games. In the comprehensive application stage, games focused on "competition" are designed, such as "Five-a-Side Football Match," "Football Carnival," and "Class League," allowing students to improve their ability to comprehensively apply techniques and tactics in a competitive context.

Each game activity case includes the game name, applicable grade level, game objectives, game preparation, game method, game rules, teaching suggestions, and evaluation points, etc., relying on standardized design modules to achieve deep integration of three-dimensional education. The formula for integrating education through a single game is as follows:

$$G_{effect} = \alpha K + \beta S + \gamma Q \quad (4)$$

In the formula, G_{effect} represents the comprehensive educational effect of a single football game; K , S , and Q correspond to the three-dimensional educational indicators of knowledge, skills, and character development, respectively; α , β , and γ are the educational weight coefficients for each dimension, dynamically adjusted according to the characteristics of each educational stage to ensure that games at each stage balance knowledge transmission, skills training, and character development. In the game design process, special emphasis is placed on the educational value of the games, organically integrating knowledge transmission, skills training, and character development into the game process. For example, in the "Dribbling Relay" game, not only are students' dribbling skills and speed improved, but their teamwork spirit and awareness of rules are also cultivated.

3.3 Curriculum Implementation and Evaluation Scheme Design

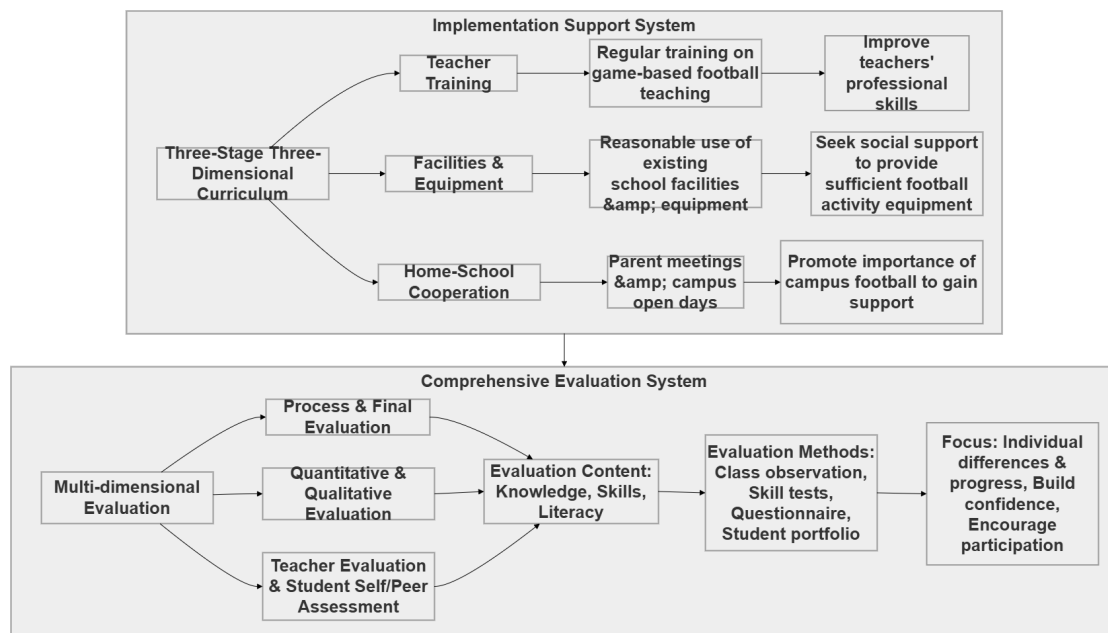


Figure 1. The "Three Stage Three Dimensional" Curriculum System

To ensure the smooth implementation of the "three-dimensional" curriculum system (as shown in Figure 1), this paper designs a comprehensive curriculum implementation guarantee system, including teacher training, venue and equipment guarantee, and home-school cooperation. In terms of teacher training, physical education teachers are regularly organized to participate in football gamification teaching training to improve their professional quality and teaching ability; in terms of venue and equipment guarantee, the school's existing venue and equipment resources are used reasonably, and social support is actively sought to provide students with sufficient football activity equipment; in terms of home-school cooperation, the importance of campus football is publicized to parents through parent meetings, campus open days, etc., to gain their support and cooperation [13].

This paper adopts a multi-dimensional evaluation method and establishes a comprehensive evaluation system that combines process evaluation with summative evaluation, quantitative evaluation with qualitative evaluation, and teacher evaluation with student self-evaluation and peer evaluation. The evaluation content covers three dimensions: knowledge, skills and literacy, and the evaluation methods include classroom observation, skills testing, questionnaire survey, student growth files, etc. In

the evaluation process, special attention is paid to the individual differences and progress of students, encouraging students to actively participate and helping them build self-confidence.

4. Results and Discussion

4.1 Comparative Analysis of Comprehensive Indicators between Experimental and Control Groups

After a year-long teaching experiment, this paper conducted a unified assessment of all students in the experimental and control classes from four core dimensions: football skills, physical fitness, sports interest, and teamwork. All data are rounded to the nearest whole number after statistical analysis. The specific results are shown in Table 1.

Table 1 Comparison of various evaluation indicators between experimental class and control class students (Unit: points, out of 100 points)

Evaluation dimension	experimental class	control group	Score difference
Football skills	86	62	24
physical fitness	83	65	18
Sports interest	90	59	31
team collaboration	88	61	27

Table 1 shows that the experimental class students scored significantly higher than the control class in all four assessment indicators. The largest difference is in sports interest scores, reaching 31 points, indicating that the three-tiered, three-dimensional curriculum system incorporating gamification effectively reversed students' resistance to football classes and fully mobilized their participation. The differences in football skills and teamwork scores are 24 and 27 points respectively, demonstrating that the tiered and progressive curriculum model can efficiently solidify students' football skills while simultaneously achieving the goal of cultivating overall competence. The difference in physical fitness is 18 points, proving that fun and progressively challenging football games can steadily improve students' physical fitness. Overall, students' development in all aspects is relatively slow under the traditional teaching model, while the new curriculum system significantly improved students' comprehensive abilities.

4.2 Analysis of Football Skill Mastery at Different Grade Levels

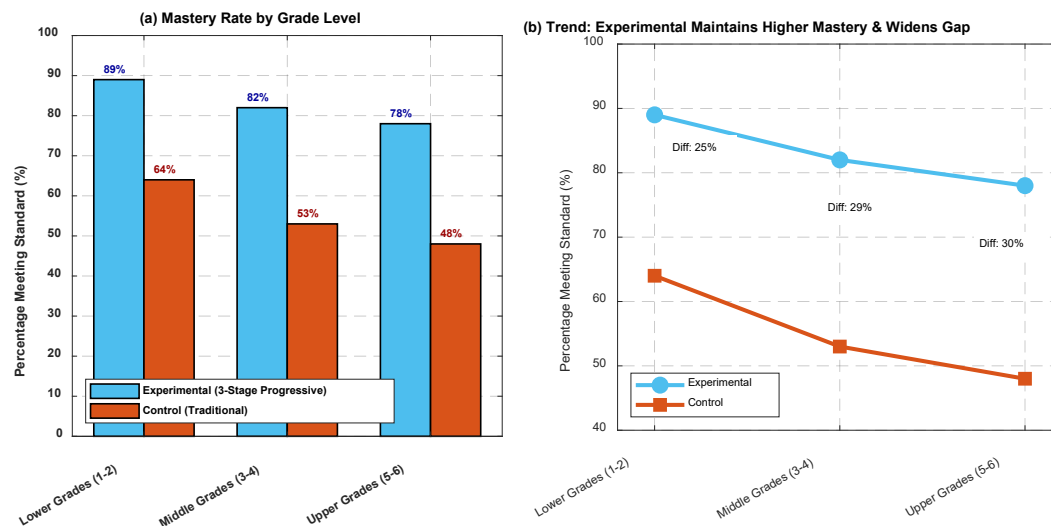


Figure 2. Analysis of the mastery of football skills among classmates

This experiment, divided into three stages according to the curriculum (as shown in Figure 2), statistically analyzed the percentage of students who met the basic football skills standards in the lower, middle, and upper grades. In the lower grades (grades 1-2), 89% of students in the experimental class met the standards for ball control and basic ball-touching techniques, compared to 64% in the control class. In the middle grades (grades 3-4), 82% of students in the experimental class met the standards for specific skills such as dribbling, passing, and stopping, compared to 53% in the control class. In the upper grades (grades 5-6), 78% of students in the experimental class met the standards for

comprehensive skills such as passing and movement, and shooting in actual matches, compared to 48% in the control class. The increase in difficulty from one grade level to the next was accompanied by a slight decrease in both classes' skill achievement rates; however, the experimental class maintained a consistently high level relative to the control class, and the gap between them widened over time. Traditional methods of teaching rely heavily on mechanical imitation training. This leads to many lower-grade students becoming disinterested in continuing to develop their skills. As a result, they develop weak skill foundations in lower grades, which makes it extremely difficult for them to develop complex skill structures in middle and upper grades and leads to a significant disparity in their ability to learn. The three-layered, three-dimensional design of the curriculum exposed students to different game activities that were tailored to their individual learning stages. Lower-grade students learned how to control the ball using a fun game to develop their motor skills, middle-grade students practiced how to execute specific skills using a game, and upper-grade students practiced executing the technique using a game with a competitive element. The progressive model of subsequent skill sets matches the students' patterns of cognitive and motor development, which allows all elementary school students to successfully master the soccer skill set at each of the levels; therefore they all excel in developing their soccer skills over time. In addition, the phased curriculum design used in instructional methods will assist in overcoming the difficulties experienced in previous instructional methods, including poor continuity and diverse skill levels of students, and it confirms the practical worth of phased curriculum designs in the instruction of skills.

4.3 Analysis of Classroom Participation and Comprehensive Quality Development

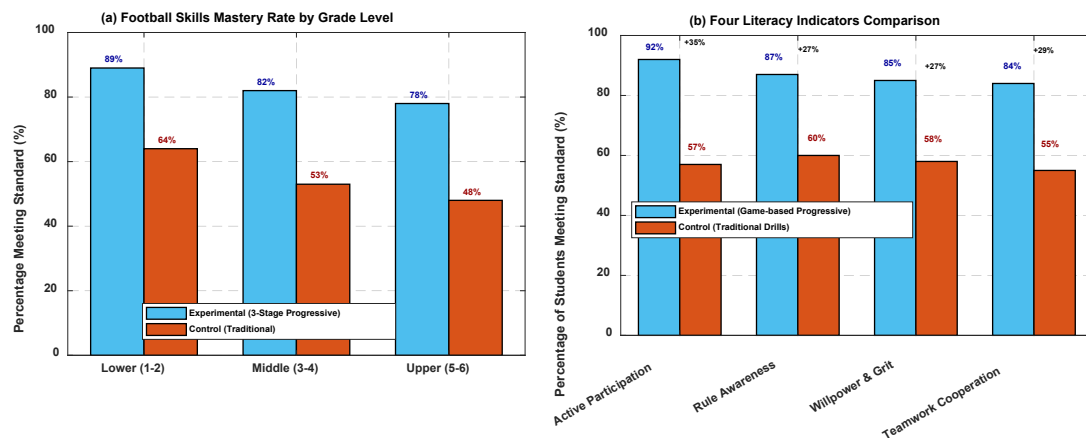


Figure 3. Comparison Between Experimental and Control Classes: Skills & Literacy Development

During the experiment, classroom observation, questionnaires, and peer evaluation (as shown in Figure 3) are used to continuously monitor four key indicators of student qualities in both classes: the percentage of students actively participating in class, rule awareness, willpower, and teamwork. The average percentage of students actively participating in class throughout the academic year is 92% in the experimental class and 57% in the control class; the percentage meeting the rule awareness assessment is 87% in the experimental class and 60% in the control class; the percentage meeting the willpower assessment is 85% in the experimental class and 58% in the control class; and the percentage meeting the teamwork assessment is 84% in the experimental class and 55% in the control class. The data clearly demonstrates that gamified courses have completely changed the passive learning state of students in traditional classrooms, with the vast majority of students willing to actively participate in football activities. In terms of character development, various group games, group competitions, and class matches allow students to engage in sports under the constraints of rules, subtly cultivating a sense of rules; the challenging elements and competitive aspects of the games cultivate students' perseverance and fighting spirit; and relay games and team battles continuously strengthen students' communication, cooperation, and teamwork spirit. The control group model produced lower levels of student enrollment, fewer opportunities for building up character, and many of the significant character features have been very slow to develop. This shows that the three-dimensional, three-tiered education system eliminates the traditional misconceptions of only working on technical skills versus working to build character. By developing character traits through all of the educational processes of Sunshine Sport, it carries out the basic principle of "sunshine sports"—building physical and character together—and provides practical and promotional benefits to the school and its community.

5. Conclusion

The problems in primary school football teaching discussed in this article indicate that it is necessary to adopt formal curriculum measures to address them. In addition, the study proposes a "three-tier, three-dimensional" curriculum model, which includes three levels of learning ("basic cognitive knowledge, skill level mastery, and overall application") and three learning dimensions ("knowledge foundation, skill participation, and literacy participation"). The results of this study support these proposed levels of understanding, indicating that teamwork and the cultivation of a certain level of overall literacy can also be developed as part of the concept of 'sunshine sports'. The current research results indicate that the course mode significantly affects the achievement level of participants. However, the theoretical significance of the research results may indicate that these important findings contribute to the establishment of a knowledge base related to the primary school football curriculum model and provide innovative ideas for gamified physical education teaching. In addition, the practical significance of this study may indicate that the core results provide teachers with insights into the operational curriculum model and provide relevant course document examples, which can serve as a reference source for frontline teachers. Considering the limitations of current research, the limited sample size of individual primary schools may limit the applicability of the models developed for the study, and the longitudinal impact has not yet been determined. Regardless of the results of this study, further research can be conducted to determine the impact of the three-layer three-dimensional curriculum model in a wider range of locations and types of primary schools, thereby continuing to enhance the value associated with the curriculum model.

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