Article

A Large-Unit Learning Design for Physical Education and Health Based on the Core Literacy Principal--An Example of a Junior High School Volleyball Lesson

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Abstract: Physical education and health education play a fundamental role in promoting the comprehensive development of young students and constitute an essential component of school education. With the continuous advancement of educational reform in China, the concept of core literacy has gradually become a central concern in the field of physical education, emphasizing the cultivation of students' key abilities, essential character traits, and lifelong development capacities through discipline-based learning. In order to better respond to the developmental requirements of students' core literacy in physical education, the design and implementation of large-unit learning have emerged as an important pedagogical approach. Large-unit learning design helps overcome the fragmentation of traditional teaching content, enhances the internal coherence of learning objectives and activities, and promotes the integrated development of knowledge, skills, attitudes, and values. Based on this background, this study systematically examines the necessity of adopting large-unit learning design in physical education under the framework of core literacy cultivation. Furthermore, in light of the practical, applicable, and integrative characteristics of physical education core literacy-oriented unit design, and guided by the fundamental principles of large-unit design aligned with disciplinary core literacy goals, this study analyzes and organizes the key elements involved in the design of large-unit learning in physical education. These elements include learning objectives, content structure, learning tasks, teaching strategies, and evaluation methods, all of which are closely connected to students' actual learning experiences. To enhance the concreteness and operability of the analysis, a junior high school volleyball teaching unit is used as an illustrative case to demonstrate the elemental characteristics and implementation pathways of large-unit learning design in physical education. The findings aim to provide theoretical support and practical reference for physical education teachers in planning and implementing large-unit teaching designs, thereby contributing to the effective cultivation of students' core literacy through physical education practice.

Keywords: sports and health; core competencies; large unit design

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1. Introduction

Physical education and health education constitute an essential pathway for promoting the comprehensive development of children and adolescents, playing a foundational role in cultivating physical fitness, psychological well-being, social adaptability, and lifelong exercise awareness. In the context of compulsory education, physical education is no longer limited to the transmission of motor skills or the

improvement of physical indicators, but increasingly emphasizes the holistic development of students through structured and meaningful learning experiences. The Physical Education and Health Curriculum Standards for Compulsory Education (2022 Edition) issued by the Ministry of Education of China explicitly identify "athletic ability, healthy behavior, and physical integrity" as the core qualities of the curriculum, providing a clear value orientation and developmental direction for physical education teaching at the compulsory education stage. Together with the corresponding standards for senior secondary education, these curriculum documents form a coherent and articulated system that underscores the educational value of cultivating individuals through sports participation and physical practice [1].

Under the ongoing reform toward literacy-oriented education, the focus of teaching has gradually shifted from fragmented knowledge instruction to the integrated development of students' core competencies. In this process, large-unit teaching has emerged as a crucial instructional approach that supports this transformation. Large-unit teaching emphasizes the systematic organization of learning content around meaningful themes or learning goals, highlights the internal connections among learning tasks, and promotes the coordinated development of knowledge, skills, processes, and values. Compared with traditional lesson-based teaching, large-unit teaching is more conducive to fostering students' deep learning, transfer ability, and sustained engagement, thereby aligning more closely with the cultivation goals of core literacy in physical education and health courses.

However, in contrast to subjects such as language arts, mathematics, and science, research and practical exploration related to large-unit teaching in physical education remain relatively limited. Existing teaching practices in physical education often still exhibit characteristics such as content fragmentation, short-term skill orientation, and insufficient linkage between learning objectives and assessment. These issues restrict the effective implementation of curriculum standards and hinder the comprehensive development of students' core qualities. Therefore, there is a clear need to further explore the theoretical foundations and practical pathways of large-unit teaching specifically within the context of physical education and health education.

Based on this background, this paper focuses on the significance of implementing large-unit teaching in physical education and health courses and explores key considerations for its instructional design. By analyzing the alignment between core literacy requirements and large-unit teaching principles, the study aims to clarify how large-unit teaching can be effectively applied to physical education practice, thereby providing a theoretical basis and practical guidance for improving teaching quality and promoting students' holistic development.

2. The Need for a Large-Unit Learning Design for Physical Education Based on the Core Literacy Principal

The large-unit learning design of physical education oriented toward core literacy represents an important instructional initiative in response to the ongoing reform of basic education. With the gradual shift of educational goals from knowledge acquisition to the cultivation of key competencies, traditional teaching models based on fragmented lesson time have increasingly revealed their limitations. In physical education teaching, lesson-by-lesson instruction that focuses on isolated techniques or short-term performance improvement often makes it difficult to support the integrated and sustained development of students' core literacy, including athletic ability, healthy behavior, and physical integrity [2]. As a result, students' learning experiences tend to be discontinuous, and the internal connection between learning objectives, learning processes, and learning outcomes is weakened.

In contrast, large-unit learning design adopts a holistic and reverse-thinking approach to instructional planning. By starting from expected learning outcomes and core

literacy goals, it emphasizes the overall structuring of teaching content and learning activities within an authentic and meaningful learning context. Through the construction of coherent teaching situations and the integration of learning tasks across multiple class sessions, large-unit design takes students' learning trajectory as a complete process rather than a collection of isolated lessons. In this way, individual knowledge points, motor skills, and experiential activities are systematically organized and mutually reinforced, enabling learning experiences to support one another and form an internally connected whole. This approach facilitates the transformation of physical education learning from fragmented and surface-level participation to systematic and continuous literacy cultivation [3].

From the perspective of instructional design, a general unit design framework that includes elements such as unit themes and lesson duration, learning objectives, assessment tasks, learning processes, assignment testing, and post-learning reflection provides a relatively complete structural reference for large-unit planning [4]. Such a framework emphasizes the alignment among objectives, teaching activities, and assessment, and highlights students' active participation and reflective learning throughout the unit. It offers important methodological inspiration for the design of large-unit learning in different subject areas.

However, in current teaching practice and academic research, the physical education and health discipline still lacks sufficient exploration of large-unit learning design explicitly oriented toward core literacy. Compared with other disciplines, existing studies in physical education often remain at the level of conceptual discussion or isolated teaching cases, and systematic design models that fully reflect the characteristics of physical education-such as strong practicality, embodied learning, situational interaction, and experiential accumulation-are relatively scarce. This gap restricts the effective implementation of curriculum standards and limits the potential of large-unit learning to enhance teaching quality.

Therefore, it is necessary to further explore large-unit learning design paths that are consistent with the nature of physical education and aligned with the cultivation of core literacy. By clarifying the necessity, value, and design logic of large-unit learning in physical education, and by integrating disciplinary characteristics into unit planning, teaching practice can be better guided toward systematic, coherent, and development-oriented instruction, thereby effectively improving the overall quality and educational effectiveness of physical education and health courses.

3. Design Elements of a Large Unit of Study in Physical Education Based on the Core Literacy Principal

3.1. Goal Orientation: Building a System of Learning Goals for Large Units

Learning objectives are the starting point and attribution of the design of the large unit, guiding the whole teaching design and aiming to answer the question of "what to learn". Learning objectives, as the first part of learning design, reflect the "result-oriented" characteristics of reverse thinking design. The design of large-unit learning objectives refers to the design of large-unit learning objectives according to the course outline and teaching objectives, dividing the entire learning content into a number of relatively independent and interrelated large units, and formulating specific learning objectives for each large unit [5]. At the same time, it is necessary to infiltrate the concept into the design of learning objectives to ensure that the objectives are clearly oriented to provide a basis for learning tasks and evaluation, so that the teaching is closely related to the theme, and enhance the operability.

3.2. Content Consolidation: Structured Learning Content Design for Large Units

The content of learning is integrated throughout the unit and is designed to answer the question of "what to learn". It is the carrier for the generation of goals, and it is also a concrete way for the formation of core literacy. When creating a large unit of physical

education based on the core qualities of the discipline, teachers need to be based on the requirements of the new standard, transcend the limitations of the textbook, and transform the knowledge of the discipline into a structured learning system. The new curriculum specifies that the learning content of each sport is divided into six areas: basic knowledge and basic skills, technical and tactical applications, physical fitness, display or competition, rules and refereeing methods, and viewing and evaluation. In the design of a large unit, it is necessary to realize the organic connection between the contents through horizontal integration, and to vertically connect the contents of different units to ensure coherence and completeness.

3.3. Context-Driven: Large-Unit Contextualized Learning Task Development

The learning task is aimed at exploring "how to judge the degree of learning". The new standard advocates contextualized learning, advocating the creation of real, complex motor situations (i.e., real learning tasks) to stimulate students' enthusiasm for learning and desire to explore, in order to help students solving real-life problems as the goal [6]. Learning tasks are carried out throughout the learning design, which should be appropriately decomposed and gradually become complex and in-depth, so as to help students obtain a complete learning experience that matches the learning process. In physical education and health, students can choose to create "real-world" situations in which there are many uncertainties and students need to respond quickly and apply what they have learned to make decisions, which is more likely to result in a deeper understanding of how knowledge and skills can be applied.

3.4. Process Progression: Large Unit Progressive Learning Process Planning

The learning process aims to explore in depth how students 'acquire and learn' particular knowledge and skills. This process focuses not only on the specific content that students learn, but also on how they organize their learning activities and embed their learning tasks. The large-unit learning process needs to be progressively refined, driven by big concepts, big scenarios, big problems, and big tasks, in order to achieve the progression of knowledge from memorization and understanding to transfer and application [7]. The so-called progression refers to the trend of spiraling development of students' core literacy in PE and health at different stages of the learning process. Constructing a progression learning path: keeping the learning content coherent, warming up to activate old knowledge, providing a transition foundation, carrying out learning activities step by step, and training in cascading thinking.

3.5. Evaluation Integration: Implementation of Evaluation for Large-Unit Integrated Learning

The essence of learning assessment is to answer the question of "how effective is the learning", and the ultimate goal is to effectively promote students' growth. The new standard requires assessment based on core qualities, and makes clear the direction of learning assessment, focusing on students' athletic ability, healthy behaviors and physical integrity. However, in the evaluation process, these three aspects can not be assessed separately, the need for integrated evaluation of students' core literacy, weakening the score form sports performance, focusing on students' mastery of complete movement and overall development. And the key to the development of core literacy lies in the accumulation of the process, teachers should strengthen the feedback role of the process evaluation when learning evaluation, emphasizing the assessment of the students' thinking and ability to demonstrate the performance of the learning process, and improve the reference value of the evaluation results.

3.6. Hierarchy of Assignments: Organization of Large-Unit Structured Learning Assignments

Assignments and quizzes are designed to determine the actual level of mastery over a period of time in order to determine whether or not students have "really learned". A

large unit of instruction is a structured learning process, and as essential elements of this process, homework and tests should also be structured. Post-lesson assignments and tests with structured characteristics allow for systematic planning, including the co-ordination of the content, type and difficulty of the assignments in each lesson. It strengthens the correlation and progression between different homework assignments and reduces the mechanical repetition of low-level objectives or repetitive exercises in unit teaching, thus reducing the learning burden of students and making them learn more efficiently.

4. An Example of a Large Unit Design for a Level 4 Volleyball Lesson

Table 1 summarizes the unit study design for the eighth-grade volleyball "School Volleyball League Preparation Camp," including session objectives, learning content, exercises, and evaluation methods.

Table 1. Eighth Grade Volleyball "School Volleyball League Preparation Camp - Advancement from Skills to Tactics" Unit Study Design.

Topics	**Campus Volleyball League Preparation Camp - Practical Advancement from Skills to Tactics**		
Module Big Idea	1. Technical transfer: to understand the application of the principle of "dynamic balance" in passing and receiving the ball. **2.** Tactical thinking: to appreciate the value of "space occupation" in offense and defense, and to adjust the position of offense and defense.		
Module objectives	1. Motor skills: master the basic techniques of volleyball padding, passing and serving, and be able to apply them in combination in matches (e.g., "pad-pass combination serve-receive"); develop specialized physical skills such as speed of movement and sensitivity of reaction. 2. Healthy Behavior: actively use safety protection strategies (e.g., cushioning for rolls) during games; develop the habit of warming up before sports and stretching after games; cultivate emotional regulation and stress-resistant abilities through teamwork tasks. 3. Physical Character: to be able to persevere in the face of difficulties and not to give up easily; to be able to collaborate with teammates in a team to complete the game; to respect the referees and opponents and to embody the spirit of fair play; to develop a sense of responsibility through the division of roles (e.g., team captain, referee).		
Hour	**Learning content**	**Mandate**	**Operation**
1	Familiarity with the ball; techniques for moving the pace; moving the throw and catching the ball	Padding competition: complete 20 consecutive standard padding moves	Review the steps learned for movement (slide, parallel, crossover, straddle); catch and throw the ball on the move 20 times
2	Front two-handed cushion ball (cushion fixed ball→one throw and one cushion→self-cushion ball)		50 reps of padding a stationary ball; 20 reps of one throw and one padding with a partner; Plank support pk race
3	Mobile + front two-handed pads (mobile pads fixed ball→one throw and one pad→two people mutual pads)		One throw and one pad with partner 20 times (throw position is not fixed); two people pad

			each other 20 times; Sit-ups 20 reps 3 sets
4	Positive overhand passes (pass a stationary ball→two-person one throw and one pass→self-pass ball)		20 passes of a stationary ball; 20 passes with a partner/parent in one toss; 3 sets of 10 finger presses
5	Passing ball ball practice (two-person pairs passes→high and low staggered passes→passes against the wall)	Passing competition: complete 20 consecutive standard passing plays	Pass the ball alternately high and low 20 times; pass the ball against the wall 30 times; 3 sets of 10 finger-presses
6	Moving + passing (moving to pass a stationary ball→two people one throw and one pass→two people pair pass)		20 passes with a partner (the position of the ball is not fixed); 20 passes each in pairs; 3 sets of 20-meter runbacks
7	Side Underhand Serve (unarmed Movement Exercises→Tossing Exercises→Hitting Points→Serve Against the Wall)		10 reps of unassisted movement exercises; 10 reps of tossing exercises; 20 reps of serving against the wall; 3 sets of 10 lunge jumps
8	Lateral underhand serve (close serve over the net→mid-range serve over the net→serve line serve)	Big Serve Competition: 5 effective serves in a limited area	20 serves against the wall; 20 close to the net; 20 long distance serves; 20 serves from the tee line; 3 sets of 10 bobble jumps
9	Lateral underhand serve + receive		30 serves, 30 self-pads, and 30 passes against the wall; high kick 20 times 3 sets
10	Basic skill set practice in groups of 3: serve, pad, pass		Passing, cushioning and serving exercises 20 times each
11	Beginning Snapping (Snapping Jumping Up→Snapping Hand Shape and Swinging Movement→Snapping Fixed Ball)		Practice snapping the ball up and jumping 20 times; swinging arms 20 times; snapping the fixed ball 20 times with a partner/parent
12	Dunking against the wall (practice wrapping the ball against the wall→one throw and one dunk aganst the wall→self throw and self dunk against the wall)	Dunk contest: complete 5 effective dunks	30 reps to the wall; 30 reps to the wall with one throw and one snap/self-toss and self-snap; 3 sets of 15 deep squat jumps
13	Snapping the ball over the net (one throw and one snap over the		30 times to the wall; a throw and a buckle over the net 30 times; a pass

	net→one pass and one snap over the net)		and a buckle 30 times; in situ vertical jump 20 times 3 groups
14	Basic Skill Set Practice		Passing, padding, serving and dunking exercises 20 times each; duck walk 50 meters 2 groups
15	Watch a volleyball game and learn the basic rules of the game, rotation rules, and refereeing rules; try a 6v6 game		Watch the classic matches, learn the rules of the game, rotation rules, referee calls, watch and learn more
16	"Middle-1-2" offensive formation	Flexibility in applying techniques and tactics to the game	Review the "middle one-two" offensive formation; 20 reps each of passing, cushioning, serving, and dunking drills
17-18	3v3/4v4/6v6 group match play (organize three strikes, students try to referee)		Write down the learning experience and game experience
Evaluating Learning	Athletic ability: technical standardization test (e.g., serve success rate) + game performance (e.g., number of effective defenses) + in-class performance Healthy Behavior: Warm-up design work + observation of self-protection awareness during the game. Sportsmanship: Self-assessment of fair refereeing behavior through "Referee's Diary" and teammates' assessment of each other's spirit of cooperation.		

5. Conclusion

In the context of implementing the new curriculum and promoting the development of students' disciplinary core qualities, large-unit learning design plays a pivotal role in enhancing the systematic, integrated, and sustained development of students in physical education and health courses. Despite its importance, the design and implementation of large-unit learning remain a challenging task for teachers who are accustomed to traditional lesson-based teaching modes. Effective large-unit design requires teachers to first clarify the educational objectives and nurturing qualities specific to the physical education and health discipline, deeply understand the practical significance of cultivating students' core literacy, and recognize the potential of large-unit learning to strengthen students' holistic development in athletic ability, healthy behavior, and physical integrity. Teachers also need to thoroughly explore the principles, concepts, and characteristics of unit-based learning that align with disciplinary core literacy, and to envision the ideal structure and form of large-unit teaching.

This paper has systematically analyzed and organized the essential design elements of large-unit learning in physical education, including objectives, content structure, learning processes, teaching strategies, and evaluation methods, and illustrated these elements through the example of a junior high school volleyball unit. The case demonstrates how learning objectives, instructional activities, and assessment can be integrated in a coherent and meaningful manner, providing a practical reference for educators seeking to implement large-unit teaching. However, translating the theoretical

framework of large-unit design into practical classroom action remains a complex endeavor. Teachers must actively experiment, adjust, and reflect on their teaching practices to bridge the gap between knowledge and practice, and to ensure that large-unit learning contributes effectively to the cultivation of students' core literacy.

Overall, large-unit learning design represents both an opportunity and a challenge: it offers a pathway to move beyond fragmented, short-term instruction toward systematic, development-oriented teaching, while requiring educators to engage in continuous professional growth, pedagogical innovation, and reflective practice. Through sustained exploration and application, large-unit learning can gradually become a key strategy for enhancing the quality of physical education teaching and promoting the comprehensive development of students.

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