Article

Research on the Application of the Game-Based Teaching Method in Teaching Modern Agriculture in American Junior Middle School Geography

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Abstract: At present, the process of the new curriculum reform is gradually being carried out. Some teachers have changed the traditional teaching mode, and many new teaching methods have begun to gradually appear in the teaching process of teachers. However, at present, in many middle school geography classrooms, the teaching mode is still based on a single traditional teaching, which leads to students' low learning enthusiasm, making it easy for them to get tired easily, and finally failing to achieve the ideal teaching effect. Therefore, this paper discusses the application of the game teaching method in middle school geography classrooms, reveals the far-reaching significance of this method in middle school geography teaching, and has guiding and reference significance for the development of game method teaching practice activities. Starting from a large body of game literature, this paper defines game teaching and is based on the theory of attention and Huizinga's "game man" theory. The questionnaire survey method and interview method are mainly adopted, taking Baijia Town Middle School in Luliang County, Qujing City, as the experiment object to understand the current situation of geography teaching in Baihu Town Middle School, conduct teaching practice, and discuss the problems in geography teaching in Baihu Town Middle School. The conclusions are as follows: game design should give full play to the dominant position of students; arrange game time and grasp the teaching focus; the game teaching design is not perfect to achieve the teaching effect; teachers have different levels of new media technology, and the overall level is not high. In view of these problems, the corresponding suggestions and prospects are put forward, hoping to provide some theoretical support for the future research of middle school geography classroom teaching.

Keywords: game teaching method; junior high school geography; applied research; American modern agriculture

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1. Introduction

The "Basic Education Curriculum Reform Outline" advocates curriculum reforms aimed at "reducing excessive focus on knowledge transmission and emphasizing the cultivation of proactive learning attitudes, making the process of acquiring basic knowledge and skills simultaneously a journey of learning how to learn and developing proper values" [1]. In future classroom teaching, theoretical knowledge and games should be closely integrated to create a more engaging and student-centered learning environment. Under appropriate conditions, applying game-based teaching methods aligns with the goals of national basic education reform and provides opportunities for more interactive and motivating classroom experiences.

The Geography Curriculum Standards further clarify the objectives of junior high school geography education: "to foster students' interest in geographical studies, develop

their geographical thinking awareness and capabilities, master fundamental geographical knowledge and skills, and enhance practical application abilities" [2]. As an innovative instructional approach, game-based pedagogy not only enhances students' interest in learning geography but also cultivates multifaceted abilities, including creativity, critical thinking, and practical skills. However, this method has yet to gain widespread adoption in schools, particularly in geography education, where traditional teacher-centered approaches remain predominant. Therefore, incorporating game-based instruction into junior high school geography education represents a promising pedagogical model that can enrich learning experiences and better meet the diverse needs of students. This approach is consistent with the requirements of the National Geography Curriculum Standards and merits more extensive implementation in classroom practice.

This study employs game-based pedagogy to design lesson plans, identify challenges in traditional secondary geography teaching, evaluate teachers' implementation of game-based approaches, and develop practical case studies for junior high geography education. By implementing the "Modern Agriculture in the United States" lesson at Xiaobaihu Town Middle School in Luliang County, the author conducted post-class evaluations and practical teaching analyses. The findings reveal authentic feedback from both teachers and students regarding game-based instruction, explore the feasibility of integrating geography education with game elements, identify challenges, facilitate teacher-student communication, and provide a foundation for further improving classroom teaching quality and effectiveness.

2. Theoretical Basis, Ideas, and Methods

2.1. Theoretical Basis

Regarding the core theories in game-based teaching, this study synthesizes and integrates relevant theoretical frameworks based on a comprehensive literature review, taking into full consideration both adolescents' psychological characteristics and established pedagogical principles to ensure effective and engaging instructional design that can maximize learning outcomes.

1) Attention Theory:

Attention is conventionally defined as a mental process, but fundamentally, it refers to the capacity for focused concentration. In psychological research, attention is characterized by five key attributes: directionality, intensity, duration, scope, and distribution. Understanding and appropriately applying these attentional characteristics is crucial for designing effective learning activities in game-based contexts. In practice, this involves structuring tasks and challenges in a way that aligns with students' attention spans, cognitive load, and motivational levels. For example, in a gamified lesson on "Modern Agriculture in the United States," breaking down complex topics into sequential mini-tasks, providing immediate feedback, and integrating engaging visual or interactive elements can help maintain student focus, reinforce comprehension, and sustain active participation throughout the learning process [3].

2) Huizinga's "Game Player" Theory:

Developed in the 1930s, Huizinga's framework emphasizes the voluntary and intrinsically motivated nature of play. He defines play as activities occurring within specific contexts that go beyond daily necessities or material incentives, characterized by passionate engagement and adherence to self-determined yet binding rules [4]. This theory aligns closely with the "play spirit" concept in geography education, suggesting that students can learn more effectively when engaged in meaningful, rule-based, and enjoyable activities. In practical terms, incorporating role-playing, simulation games, or virtual farm management into geography lessons allows students to explore concepts actively, make informed decisions, collaborate effectively with peers, and reflect on outcomes, thereby deepening their understanding of agricultural systems, regional differences, and the interconnections between human activity and the environment.

2.2. Methodology

This study investigates the application of game-based pedagogy in teaching "Modern Agriculture in the United States" within junior high school geography curricula. The research methodology involves three key phases: First, conducting comprehensive literature reviews through institutional resources, including the university's digital library and CNKI database, to establish a robust theoretical foundation for gamified instruction; Second, interviewing experienced educators to identify suitable content, instructional strategies, and potential challenges for effective gamification implementation; Third, implementing teaching trials that incorporate carefully designed game-based activities, accompanied by student feedback surveys and stratified assessments to systematically evaluate learning outcomes, engagement levels, and knowledge retention. Through detailed analysis of student responses and classroom observations, this process identifies both existing challenges and potential improvements in game-based instruction at the junior high level, providing empirical evidence to support the study's conclusions. These findings subsequently inform refinements to the research methodology, instructional case design, and the development of practical recommendations for integrating gamified approaches into geography education.

3. Game-Based Teaching Methodology Design

3.1. Content Selection for Game Approach

3.1.1. Basis for Selecting "Modern Agricultural Development in the United States"

Through analysis of junior high geography textbooks and curriculum standards, knowledge about agricultural modernization in the United States emerges as both a key learning focus and an important component of assessments. Understanding the reasons behind America's agricultural prosperity—such as technological innovations, mechanization, advanced farming techniques, and regional specialization—requires students to connect economic, environmental, and social factors. Additionally, analyzing the distribution patterns of agricultural zones based on natural conditions involves memorizing geographic coordinates, climate influences, soil characteristics, and crop types, which can be challenging for students.

Given these complexities, integrating American-related content with game-based learning offers a practical and effective solution to reduce students' resistance to memorization, promote active engagement, and foster meaningful learning experiences. Through structured gameplay, students can actively explore spatial patterns, simulate agricultural processes, analyze real-world scenarios, and interact with content in a hands-on manner. This approach not only helps them acquire fundamental geographical knowledge but also encourages deeper cognitive processing, critical thinking, problem-solving, and long-term retention, all while making the learning experience enjoyable, motivating, and relevant to real-world contexts.

3.1.2. Significance of Selecting "The United States"

For Students: The advanced agricultural system in the United States provides an exemplary model for understanding regional development, economic organization, and the interrelationships between environmental, social, and technological factors. By progressing through challenges in the carefully designed games and earning rewards, students not only deepen their comprehension of lesson content but also cultivate curiosity, intrinsic motivation, and self-directed learning skills for geography study. This approach enables them to actively engage with complex concepts, such as agricultural distribution patterns, mechanization, technological innovations, and regional specialization, while experiencing the enjoyment of interactive and participatory learning. As a result, students can acquire essential geographical knowledge more effectively, reinforce long-term retention, and develop a lasting interest, enthusiasm, and confidence in the subject.

For Teachers: Analysis of the textbook, curriculum standards, and relevant pedagogical frameworks helps identify content that is particularly well-suited for gamified instruction. Incorporating topics such as "modern agricultural development in the U.S." into game-based activities allows teachers to enhance their instructional design capabilities, create more engaging and meaningful learning experiences, and align activities with learning objectives. Through iterative planning, implementation, reflection, and evaluation of student outcomes, teachers can continuously refine game elements, instructional strategies, assessment methods, and classroom management approaches, thereby improving both teaching quality, student engagement, and overall classroom effectiveness.

3.2. Strategies for Game-Based Instructional Design

3.2.1. Enhancing Participation in Learning Processes

As seventh-grade students mature, their cognitive abilities become increasingly developed, allowing them to engage more actively and thoughtfully in learning processes. Integrating games into geography lessons not only helps students observe, analyze, and understand geographical phenomena but also facilitates the acquisition of foundational knowledge in an engaging, interactive, and student-centered environment, thereby stimulating interest, motivation, and sustained participation—effectively achieving the principle of "learning through fun" [5]. For instance, when teaching students to memorize U.S. agricultural zones, each student was asked to represent their assigned locations using familiar animals, create detailed treasure maps through drawing, and explain their reasoning to peers. The most creative, accurate, and well-explained designs were then showcased to the class. This method not only reinforced spatial and conceptual understanding but also effectively motivated students, ensured active participation from every learner, promoted peer learning, and fostered a positive, collaborative, and dynamic classroom atmosphere.

3.2.2. Blending Traditional Teaching with Gamified Instruction

While traditional teaching methods have certain limitations, new instructional approaches also involve inherent trade-offs and practical challenges. Conventional methods can be monotonous, often leading to student fatigue, reduced attention, lower classroom engagement, and limited opportunities for active learning. On the other hand, gamified teaching can significantly enhance student motivation, participation, curiosity, and self-directed learning but may encounter challenges in maintaining instructional pace, balancing content coverage, and ensuring rapid mastery of learning objectives. Therefore, rather than completely replacing traditional methods, teachers should adopt a hybrid approach that thoughtfully integrates game-based instruction with conventional practices, as this balanced combination can more effectively support the comprehensive achievement of educational goals, promote deeper understanding, and foster sustained student engagement.

3.2.3. Emphasizing Life-Related Game Content

The concept of life-related game content refers to educational materials drawn from everyday life, carefully selected from real-world scenarios, presented in realistic, interactive, and engaging formats, and scheduled within natural timeframes to align with students' daily experiences and cognitive rhythms. These games minimize overt utilitarian purposes while actively encouraging students' voluntary engagement through immersive, meaningful, contextually relevant, and socially interactive experiences. Implementing this approach requires geography education to be closely linked with real-world contexts, fostering innovative thinking, enhancing problem-solving abilities, promoting collaborative learning, and creating relatable, memorable, and transferable learning situations. For example, when teaching about U.S. agricultural zones, educators might help students visualize the region's layout as body parts of familiar animals, incorporate role-playing, and

design interactive treasure maps, effectively connecting abstract spatial information to daily life experiences. Such scientific metaphors simplify complex concepts, reduce cognitive load, stimulate active participation and creativity, and enhance students' understanding, retention, analytical thinking, and practical application of geographical knowledge in real-world contexts.

3.3. Experimental Teaching Design for Game-Based Learning

3.3.1. Participants

The experiment was conducted at Xiaobaihu Town Middle School in Luliang County, where I interned. This study involved seventh-grade classes (Class 2 and Class 3) as experimental subjects, with Class 2 designated as the experimental group and Class 3 as the control group. Detailed information is presented in Table 1.

Table 1. Basic information of the experimental class and the control class.

Group	Total number of persons	Man student	Woman student
Lab 2	51	21	30
Control class (3)	45	22	23
Total	96	43	53

3.3.2. Experimental Purpose

By setting up and systematically comparing different teaching modes, this paper aims to examine whether the implementation of the geographical game-based teaching method can effectively enhance students' memory, attention, concentration, and overall academic performance, increase their interest, motivation, and active engagement in learning geography, promote the development of independent learning habits and self-directed study skills, and foster innovative thinking, critical analysis, and problem-solving abilities in diverse learning contexts.

4. Findings and Discussion

4.1. Research Findings

Through summarizing relevant literature, conducting detailed case studies on game-based teaching design across multiple classes and contexts, interviewing teachers during classroom observations at internship schools, and systematically implementing teaching designs with comprehensive practical feedback, the study derived the following final research conclusions.

4.1.1. Game Design Should Fully Embrace Students

Traditional geography teaching models predominantly rely on teacher-led instruction, where lecturing dominates most of the class time, leaving limited space for students' independent learning, exploration, and active engagement. Therefore, game design should not focus solely on superficial or decorative forms that may result in minimal student interaction and low participation. It is crucial to respect individual differences among students, consider their diverse learning needs, and leverage these characteristics to better highlight and cultivate their unique talents and strengths. Additionally, encouraging independent thinking, problem-solving, and collaborative skills is essential; when designing game segments, teachers should empower students with meaningful opportunities to take center stage, make decisions, and demonstrate their understanding, offering consistent praise, constructive feedback, and encouragement to boost both confidence and intrinsic motivation.

4.1.2. Game-Based Teaching Requires Strategic Time Management and Focus on Key Points

Given junior high school students' lively and energetic personalities, classroom dynamics during game sessions can easily become scattered and difficult to manage. Therefore, game time should be carefully and reasonably scheduled without excessive duration, as prolonged or poorly structured gaming may distract students from lesson content, reduce learning efficiency, and hinder overall teaching effectiveness. Overemphasizing gamification at the expense of substantive content delivery risks students overlooking essential lesson objectives. While enhancing learning interest and motivation, teachers must also maintain appropriate game timing and structured transitions to ensure sustained instructional focus and the achievement of learning outcomes.

4.1.3. The Process of Game-Based Instructional Design Remains Imperfect and Has Not Fully Achieved Desired Educational Outcomes

The current framework for game-based teaching design is still developing, resulting in an immature and evolving instructional system. While most teachers have considered using game-based methods, the limited duration of game segments (typically just a few minutes) often fails to fully engage students and sustain their active participation. Additionally, inadequate and inconsistently applied incentive mechanisms provide insufficient encouragement, ultimately failing to achieve the intended educational goals and learning outcomes. Therefore, educators should actively exchange best practices, collaborate with peers, and leverage available online teaching resources to continuously refine and improve instructional design quality.

4.1.4. Teachers' Proficiency in New Media Technologies Varies Significantly

Interviews with teachers revealed notable differences between junior and senior educators. Most veteran teachers, being less familiar with new media technologies, employ relatively fewer game-based teaching methods and are slower to adopt innovative strategies. Conversely, young teachers demonstrate greater enthusiasm and willingness for exploring and experimenting with new pedagogical approaches. However, due to limited geography curriculum allocation and time constraints in secondary schools, few teachers have had the opportunity to implement such methods extensively, leading to overall low implementation standards. Teachers should dedicate more time to exploring innovative pedagogical techniques, continuously refine their instructional practices, and enhance their teaching skills through systematic experimentation and reflective practice.

4.2 Future Directions

This study has certain limitations. The survey was conducted exclusively among seventh-grade students within a relatively small sample size, which may limit the generalizability of the findings. Moreover, the insufficient teaching time allowed for comparative analysis between traditional and game-based instruction, resulting in inadequate coverage of diverse game types, complexity levels, and engagement strategies. The author suggests expanding the survey scope to include upper grades and multiple school contexts in future teaching practices to ensure broader practical applicability and validity of the results. Additionally, diversifying game-based teaching methods, incorporating interdisciplinary content, and integrating technology-enhanced learning tools will further enhance their appeal and effectiveness. It is hoped that more educators will break free from conventional pedagogical frameworks, boldly experiment with innovative approaches, and systematically adopt gamified instruction strategies. These efforts could serve as valuable references for developing future middle school geography teaching methodologies, supporting more dynamic, interactive, and student-centered learning environments.

5. Conclusion

This study investigated the application of game-based pedagogy in junior high school geography, taking "Modern Agriculture in the United States" as a teaching case. The results demonstrate that gamified instruction can significantly enhance students' motivation, engagement, classroom participation, and comprehension of key geographical knowledge, while simultaneously fostering independent learning habits, critical thinking, and innovative problem-solving abilities. At the same time, observed limitations—such as incomplete instructional design, insufficient incentive mechanisms, time constraints, and uneven teacher proficiency in digital media—indicate that game-based methods should be regarded as a valuable complement rather than a substitute for traditional instructional approaches. Overall, the research confirms the potential value of gamified teaching as an innovative pedagogical model, providing both theoretical support and practical guidance for curriculum reform, teacher professional development, and the broader implementation of interactive and student-centered geography education. The findings suggest that integrating game-based strategies thoughtfully into classroom practice can contribute to more dynamic, engaging, and effective learning environments, ultimately supporting the holistic development of junior high school students' geographical knowledge and cognitive skills.

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