

Research on Children's Game Activity Design Strategies Based on Embodied Cognition Theory

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Abstract: Edutainment, in the kindergarten education stage, emphasizes the game as the basic activity and combines the content of education with the form of the game, thus it also forms the educational method of gamification teaching. Through investigation and analysis, it is found that the current kindergarten game activity design has the problem of improper combination of educational content and game form. The current kindergarten game activity design has problems such as stereotypes, children's lack of active learning opportunities in activities, teachers' insufficient theoretical understanding, inappropriate teacher guidance methods, and so on. Embodied cognition theory attaches importance to the important role of the body in the development of cognition, provides new guidance for classroom teaching, and opens up a new path for classroom teaching reform. Based on the perspective of embodied cognition theory, the concept of body and mind integration should be adhered to in kindergarten teaching with games as the basic activity, experiential teaching situation should be created, children's subjective experience should be respected, and games and interactions should be designed to promote children's physical and mental participation, thus laying a foundation for the realization of children's individual freedom, autonomy, and all-round development. Therefore, this paper aims at the existing problems in the current kindergarten gamification teaching and discusses the design strategy of children's game activities based on embodied cognition theory.

Keywords: Embodied cognition; Children's play; Game activity design

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1. Introduction

In kindergarten education, it is necessary to guide kindergartens to establish a scientific concept of education, standardize the conduct of kindergarten management, improve the quality of education, and promote the universal, inclusive, safe, and high-quality development of kindergarten education^[1]. In order to improve the quality of kindergarten education, we can directly study the development of children and kindergarten education and teaching in theory and practice. The Guiding Outline for Kindergarten Education (Trial) (hereinafter referred to as the Outline) points out that kindergarten education should respect the laws and characteristics of children's physical and mental development, and carry out teaching with games as the basic activity^[2]. As one of the ways to construct, understand, and know the world, embodiment promotes the strengthening or

reorganization of cognitive schema, which is conducive to the development of deep learning^[3]. For children, the world is new to them and they are full of exploration desire. Children acquire their perception of their surroundings through direct experience. However, mind and cognition do not exist independently of the body, but cognition comes from the interaction between the body and the environment^[4]. In the era of continuous renewal of educational concepts, education and teaching increasingly emphasize the particularity of individual development, no longer blindly requiring learners to obtain uniform learning results, but paying attention to the differences of individual development. The main viewpoints of embodied cognition theory coincide with the teaching practice of early childhood education. Although the two are different fields, they can realize their own theoretical depth and enhance their theoretical creativity. According to children's psychological development level and character characteristics, teachers combine the fun, interactive, and situational nature of games with their educational function. Carrying out embodied game activities is helpful in playing children's main role and promoting children's self-construction and development in depth. The term embodied can be traced back to Varela *et al.*: "Our mind is inseparable from our body, language, and social environment"^[5]. Cognition is rooted in physical action, experience is constructed in embodied interaction, and learning design moves from disembodied to embodied^[6].

2. The connotation interpretation of embodied cognition theory

Embodied cognition is a new trend of thought that emerged in Western cognitive theory research in the 1990s. This theory emphasizes the role of the interaction between body and environment in cognitive development and maintains that human cognition is not a "disembodied" mental activity occurring only above the neck, but a dynamic and generative concept formation process embedded in the environment and body^[7]. As for the connotation of embodied cognition theory, Zhou *et al.* believed that it can be explained from the following three aspects: cognition occurs in the physical experience of an individual; body and cognition influence each other; cognition is situational.

3. The status of children's game activity design

In essence, games refer to a kind of activity controlled by children autonomously, which can bring pleasant emotional experiences and have operational materials^[8]. As kindergartens often expect "strict discipline" in activities, children are required to sit properly and listen to the teacher "attentively" most of the time in group teaching activities. Excessive attention to discipline inevitably limits children's physical activity, which may lead to teaching deviating from the normal track. Embodied cognition emphasizes "body participation cognition," so we must re-examine today's teaching activities, and incorporate "body movement and body experience" neglected in traditional classroom teaching into the framework of teaching design, so as to transform our concept of early childhood education and kindergarten game activity design. At present, the problems in the design of children's game activities are as follows.

3.1. Unclear goal of game activity

In reality, games are only regarded as a simple teaching means, which teachers introduce when they want to use them, with the purpose of attracting and keeping children's attention. Some teachers think that games are free activities and often let children play at will, while teachers are completely detached from children's games. Although the above problems attach importance to the role of games, they do not deal well with the relationship between teaching and games and do not use them reasonably and properly, which makes the educational goals

of games scattered and random and fails to bring the educational value of games into play systematically.

3.2. Simple content of game activities

The content of activities in children's gamification teaching is not rich enough and relatively simple. Teachers cannot carry out education and teaching according to children's own characteristics, and the activities carried out cannot stimulate children's interest in learning. Many teachers lack a corresponding understanding of the nature of children themselves, and only blindly carry out related activities, unable to combine games with teaching content. The form of game development is relatively outdated, thus children's enthusiasm and initiative cannot be stimulated^[9]. In addition, they often take the game content as the curriculum content, adopt the form of collective teaching, specify the role and status of each child, and specify the game actions. Teachers evaluate whether they are correct or not and assess the level of children's play according to the requirements of teachers.

3.3. Inconducive game environment

At present, the setting of the gamification environment in early childhood teaching is unreasonable. In order to promote the comprehensive and healthy development of young children, we should pay attention to the setting of a positive environment. However, due to the large number of classes in some kindergartens, the space for children's activities is relatively limited. Gamification requires a larger space for children to carry out activities. The relatively small space is inconvenient for various games and activities and is inconducive to the healthy physical and mental development of children.

4. The inspiration of embodied cognition theory to the design of children's play activities

All methods that help to get embodied feeling and experience belong to the category of embodied cognition. Researchers of embodied cognition theory have found the important role of the human body in the cognitive process, and believe that human vision, touch, and perception-motor systems are involved in cognition. At the level of activity design, teachers should take into account the ability to mobilize children's various senses to participate, give full play to the unique value of children's bodies in the cognitive process, provide conditions for children to touch the breadth of knowledge, explore the depth of knowledge, and grasp the active construction of knowledge in the participation of activities, so as to help children understand their surroundings more fully and deeply and make better use of existing experience. Starting from the design of children's games and activities, the design of appropriate and challenging embodied activities to integrate children's life experiences and existing experiences is deep learning centered on children and an effective way to stimulate children's participation in active learning. Children are not only the master of the body but also the main body of the game activities.

4.1. Defining the goal of the game activity

Children's learning has the characteristics of concrete image thinking, and its rational knowledge needs to be more based on perceptual knowledge. More importantly, the form of game activities can serve in teaching and play an educational role. Therefore, the goals of game activities should be consistent with the goals of kindergarten education. It should be broken down layer by layer from the general goals of the five fields in the Outline to the goals of all ages, and then to the specific goals of game activities, so as to keep the specific content of game activities consistent with the individual goals. In this way, it can also ensure that the goals set by the game activities and the selected activities are more in line with the age development characteristics of

children. In addition, combined with the actual situation of the game activities, the goal can be slightly adjusted.

4.2. Creating a physical game environment

Embodied cognition believes that the environment is a necessary condition for individual cognition, and the body is in the environment all the time. Creating a positive environment will affect children's game learning experience. The game experience process is the process of cognitive development. Context creation should be appropriate to the educational content contained in the game, which can trigger the problems that children are interested in and facilitate cognitive assimilation and adaptation. The environment of the game is designed and arranged by adults, and the materials are selected by adults, which is the objectification of educational intention. The educational nature of the game highlights the importance of the game environment^[10]. Environment not only provides a source of information for children's cognition but also undertakes part of the cognitive work of children. Creating a real situation is not only conducive to children being infected in the situation, enhancing their physical and mental involvement, but also can help children discover problems and stimulate their inspiration to solve problems. In the context of embodied cognition, the real situation is conducive to children's real physical experience and better understanding of learning content.

4.3. Designing embodied game interactive experience

Embodied game activities can promote the transfer of children's experience accumulated in the activities, and at the same time, the environment should serve the supporting role of learning behavior, promote children to flexibly use knowledge and skills, adjust emotions and attitudes to actively solve problems, and produce, transfer, and then carry out interesting and in-depth personalized expression. The design of game activities should be child-oriented, take children's development as the core concept, respect children's experience, interest, and learning characteristics, pay attention to the value of children's games and daily life as well as children's development, and strive to create learning opportunities for children to gain experience through "direct perception," "practical operation," and "personal experience."

4.4. Promoting physical participation

The term "body" refers specifically to the biological functions of the body, including perception, movement, and experience gained in the interaction with the environment. Game teaching activities should mobilize children's physical initiative, and physical participation involves movement and psychology, which requires a variety of senses to participate together. Children's physical creative expression should be respected in the process of game participation, the creativity of children should be considered in game design, and the ideas that children may have should be integrated into the process of game activities, focusing on the combination of presupposition and generation of activities. Children are encouraged to participate in the game physically, exercise their motor ability, enhance their physical coordination and movement ability development, and then promote their advanced cognitive ability development including memory, imagery, thinking, emotions, and others. Researchers of embodied cognition theory have found that the human body plays an important role in the cognitive process, and believe that human vision, touch, and perception-motor systems are involved in cognition. Thus, we need to fully mobilize students' subjective participation and stimulate students' learning enthusiasm, initiative, and creativity.

5. Summary

Game teaching emphasizes personal participation in games and attaches importance to children's sense of

participation and experience, hoping to internalize the external perception of the body into children’s own experience through game teaching. Taking “embodied” as an important element of teaching design means that teaching involves not only the words expressed and used by teachers in a class but also the gestures, body movements, and facial expressions shown by teachers in class. It also suggests that teachers can make full use of the body movement system to teach, transforming abstract concepts or theories into operational materials or embodied activities, such as performance, games, and authenticity problem-solving.

Disclosure statement

The author declares no conflict of interest.

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