

Curriculum Design of Physical Education Based on Multiple Intelligences Theory

Chu Wang¹, Yan Zou^{2,*}

¹Shandong University of Arts, Jinan 250300, Shandong, China

²Wenzhou Medical University, Wenzhou 325035, Zhejiang, China

*Corresponding author

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Abstract: Based on the theory of multiple intelligence, this study discusses how to apply the theory to the course design of physical education to improve students' learning effect and interest. Through the in-depth analysis of the multiple intelligence theory, we find that in physical education, different types of intelligence can help students to better understand and apply the course content, and improve the effect of learning. Therefore, we propose a method for physical education curriculum design based on multiple intelligence theory and verify its effectiveness and feasibility through experiments.

1. Introduction

Physical education curriculum design is a complex and critical task that requires educators to gain an in-depth understanding of students' cognition, abilities, and interests, and to design and implement teaching activities based on these factors. In the past few decades, there has been a significant development in the definition and understanding of intelligence and intelligence, including the theory of multiple intelligences. The theory of multiple intelligences was proposed by Harvard University psychologist Howard Gardner. It defines intelligence as a multiple ability rather than a simple IQ test score.[1] Gardner divides intelligence into nine different types of intelligence, including speech language intelligence, logic mathematical intelligence, spatial intelligence, body dynamic intelligence, musical intelligence, interpersonal intelligence, introspective emotional intelligence, natural observation intelligence, and existential cosmic intelligence. In physical education curriculum design, the theory of multiple intelligences provides a very useful framework that can help educators better understand and meet the learning needs of students. For example, a student may be excellent in body dynamic intelligence, but weak in logic mathematical intelligence. Therefore, designing a physical education curriculum suitable for this student should focus on the development of body dynamic intelligence, while providing more support and challenges in logic mathematical intelligence. In this physical education curriculum design, we will design the curriculum based on the theory of multiple intelligences, and will emphasize the application of each type of intelligence in the physical education discipline. We hope that this method can stimulate students' interest and motivation, help them better understand and master sports knowledge and skills, and achieve better learning results.

2. Research Background and Significance

With the continuous development of social economy and the improvement of people's living standards, people pay more and more attention to physical health and exercise. As an important part of the school education system, physical education can not only help students to develop good physical quality and health habits, but also promote their comprehensive development and the improvement of their comprehensive ability. However, in the actual physical education teaching, many students are lack of interest in physical education courses, and even appear the phenomenon of skipping classes.[2] This not only affects the learning effect and performance of students, but also has a certain impact on the development of physical education.

In order to improve students' learning effect and interest, more and more educators have begun to explore new teaching methods and curriculum design in recent years. As an advanced educational theory, the multiple intelligence theory can help teachers to better understand students' intelligent types and learning methods, and then design more scientific and effective course content and teaching methods.[3] Therefore, this study aims to explore the application of multiple intelligence theory in physical education to improve the quality and effectiveness of physical education.

Physical education curriculum design based on multiple intelligence theory needs to consider the following factors:

Individual student differences: In physical education curriculum design, different students' physical conditions, intellectual development, and interests vary, so it is necessary to develop targeted teaching plans based on the differences of different students. For example, for students with weak physical coordination, more simple and understandable teaching methods can be adopted, such as gradually decomposing and practicing movements, to help them gradually master their skills. For students with strong physical intelligence, they can challenge their abilities and improve their skill levels through more difficult training.

Teaching objectives: The teaching objectives of physical education curriculum design should be comprehensive, including physical health, skill level, and intellectual development. For example, teaching objectives can include improving students' physical fitness, mastering sports skills, understanding sports rules, and cultivating innovative abilities.

Subject knowledge and skills: Physical education curriculum design needs to cover subject knowledge and skills, help students master basic sports skills and knowledge, and gradually improve to higher difficult skills and knowledge levels.[4] For example, for football curriculum design, it can include skills and knowledge in various aspects such as passing, shooting, defense, and tactics, to help students gradually master the basic elements of football.

Teaching methods and means: According to the theory of multiple intelligences, learning methods and means need to be selected and designed for different intelligences. Therefore, in the design of physical education courses, it is necessary to consider the cultivation of different intelligences and adopt various teaching methods and means. For example, for students with strong physical movement intelligence, practical teaching methods can be adopted, such as game-based teaching, practical exercises, etc; For students with strong language intelligence, teaching methods such as explanation and demonstration can be used to help them understand sports rules and technical essentials.

Teaching evaluation: Teaching evaluation is an important component of physical education curriculum design, which can help students understand their strengths and weaknesses and progress in different aspects of intelligence, as well as help teachers better understand students' learning situation and aspects that need to be adjusted. In physical education curriculum design, multiple evaluation methods can be used.

3. Application of Multiple Intelligences Theory in Physical Education

3.1. Concepts and Characteristics of Multiple Intelligences Theory

The theory of multiple intelligences is an intelligence theory proposed by American psychologist Howard Gardner. He holds that human intelligence is not a single and unified ability, but composed of multiple relatively independent intelligence. In his book *The Framework of the Mind*, Gardner proposed eight types of intelligence, including verbal intelligence,[5] logical and mathematical intelligence, spatial intelligence, musical intelligence, physical motor intelligence, interpersonal intelligence, introspection mental intelligence and natural observation intelligence.

The characteristics of the multiple intelligence theory include the following aspects:

Diversity: The theory of multiple intelligences holds that human intelligence is pluralistic, composed of many kinds of intelligence, each of which is relatively independent.

Relative independence: Each type of intelligence in the theory of multiple intelligences is relatively independent, that is, the high or low level of some intelligence does not have a decisive impact on the development of other intelligence.

Developability: The theory of multiple intelligences holds that everyone's intelligence can be developed and improved through continuous learning and training.

Application: The theory of multiple intelligences has been widely applied in education, career choice and other aspects, which can help people to better understand their own strengths and potential.

The proposal of multiple intelligence theory has had an important influence on the educational field. In educational practice, the theory of multiple intelligences is widely used in curriculum design, teaching evaluation and other aspects, to help educators to better understand students' intellectual characteristics and development needs, so as to better promote the overall development of students.

3.2. Application of Multiple Intelligences Theory in Physical Education

Based on the theory of multiple intelligences, we can design the physical education curriculum into a diversified and flexible form, so that different types of students can give full play to their own advantages. Here are some specific course design plans:

Body-sports intelligence: combine physical education with dance, stage performance and other artistic forms, and exercise students with their body-sports intelligence by imitating dance movements and performance skills. For example, a "body language" class can be designed to let students learn how to express their emotions and intentions through their bodies by imitating different dance movements.[6]

Music-rhythm intelligence: combine physical education with music, and improve students' music-rhythm intelligence through the feeling and imitation of music rhythm. For example, rhythm devices, music games and other activities can be introduced in the course design, so that students can feel the rhythm in the dynamic process and improve their motor coordination.

Space-image intelligence: combine physical education with aviation, architecture and other fields, and improve students' space-image intelligence by imitating the spatial structure and image. For example, three-dimensional puzzles, jigsaw puzzles and other activities can be introduced in the course design, so that students can exercise their spatial imagination and sense of spatial direction in the jigsaw puzzle.[7]

Logic-mathematical intelligence: combine physical education with mathematics and other fields, and improve students' logical-mathematical intelligence through mathematical models and statistical analysis. For example, probability statistics, movement track and other knowledge can be introduced in basketball teaching, so that students can experience the application of mathematics in sports in practical operation.

Interpersonal-communication intelligence: combine physical education with social communication and other fields, and improve students' interpersonal-communication intelligence through group activities and collaborative tasks. For example, in the course design, activities such as ball sports team competition, collaboration and crossing obstacles can be introduced, so that students can experience teamwork and communication skills in practice.

4. Experimental Verification

To verify the effectiveness and feasibility of physical education curriculum design based on multiple intelligence theory, we conducted an experimental study.

4.1. Experimental Design

In this experiment, students from a middle school, a total of 120 students. Before the experiment, the intelligence test was first conducted, and the Raven standard logical reasoning test (SRT) and the multiple intelligence test (MI) were used to measure the students. According to the evaluation results, the students are divided into two groups: multiple intelligence balance group and multiple intelligence imbalance group.

Next, the multiple intelligence equilibrium group and the multiple intelligence imbalance group are divided into experimental group and control group, a total of four groups. Among them, the experimental group adopted the physical education curriculum design based on the theory of multiple intelligences, and the control group adopted the traditional physical education curriculum design. The experiment lasted for 12 weeks with two PE sessions per week.

In the experiment, we recorded students' PE, intellectual performance, and psychological responses. The physical performance adopted the evaluation standard of physical education performance formulated by the school, the intelligence performance was measured by the Raven standard logical reasoning test (SRT) and the multiple intelligence test (MI), and the psychological response was measured by the self-compiled scale.

4.2. Experimental Results

The experimental results showed that the physical education performance of the experimental group was significantly higher than that of the control group, among which the improvement of the experimental group of the multiple intelligent balance group was more significant.[8] However, the increase in the experimental group was relatively small. In addition, in terms of intelligence performance, the SRT, performance and MI scores of the experimental group were higher than that of the control group, and the improvement of the experimental group of the multiple balance group was more significant.

In terms of psychological responses, the students in the experimental group generally showed higher learning interest and motivation, and also showed higher satisfaction with the physical education course. At the same time, the students in the experimental group showed higher confidence and team spirit.

4.3. Experimental Conclusion

The experimental results show that the curriculum design of physical education based on multiple intelligence theory can significantly improve the students' physical education performance, intellectual performance and psychological response. In particular, the effect of the experimental group of multiple intelligence balance group is more significant, indicating that in physical education,

the balanced development of multiple intelligence is more conducive to the overall development of students. Therefore, we suggest that in the future physical education curriculum design, we should fully consider the development of students' multiple intelligence, pay attention to the cultivation of students' various abilities, improve students' learning interest and motivation, so as to achieve better educational effect.

5. Discussion

This study uses a physical education curriculum design based on multiple intelligence theory, and proves that this curriculum design has a positive effect on students' overall development by measuring and analyzing students' physical education performance, intellectual performance and psychological responses. The findings are discussed further below.

5.1. Application of Multiple Intelligences Theory in Physical Education

The theory of multiple intelligences is a cognitive theory proposed by Howard Gardner in the 1980s. It holds that human intelligence is not only determined by traditional IQ, but composed of multiple intelligence. In physical education, students' intellectual development is not only reflected in the traditional subject knowledge, but also includes the intellectual development of physical sports. Therefore, adopting the physical education curriculum design based on multiple intelligence theory is helpful to cultivate students' various intelligence, so as to achieve the purpose of all-round development.

5.2. The Importance of the Balanced Development of Multiple Intelligences

The results of this study show that the effect of the multiple equilibrium group experimental group is more significant. This shows that in physical education, the balanced development of multiple intelligences is more conducive to the overall development of students.[9] In practical teaching, we should pay attention to the development of cultivating students' various intelligence, and avoid focusing on the cultivation of some intelligence while ignoring the development of other intelligence. Only by allowing the balanced development of students' various intelligence, can we better achieve their educational goals.

5.3. The Importance of Improving Students' Interest and Motivation in Learning

The results of this study also show that the physical education curriculum design based on multiple intelligent theory can improve students' interest and motivation in learning. Students' interest and motivation in learning are important factors in learning. Only by making students have interest and motivation in learning can they better promote the all-round development of students. In practical teaching, we should pay attention to cultivating students' interest and motivation in learning and stimulate students' enthusiasm for learning.[10]

6. Conclusion

In this study, we proved that the physical education curriculum design based on multiple intelligence theory has a positive effect on the overall development of students. The application of the theory of multiple intelligence in physical education is helpful to cultivate students' various kinds of intelligence. The balanced development of multiple intelligence is more conducive to students' comprehensive development, and improving students' learning interest and motivation is the key

factor to promote students' all-round development. Therefore, in the actual teaching, attention should be paid to cultivating students' various intelligence, balanced development, improve students' learning interest and motivation, in order to achieve better educational effect.

Moreover, there are some shortcomings in this study. First, the small sample size limits the generalization ability of the study results. Secondly, this study only considered the influence of physical education curriculum design based on multiple intelligence theory on students, without considering other possible factors. Future studies could adopt a larger sample size and consider more influencing factors to further explore the impact of physical education on the overall development of students.

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