The study on Integrating Air Pollution Environmental Education into the Teaching Personal and Social Responsibility Model in Physical Education

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Abstract. The WHO International Agency for Cancer Research points out that 7 million premature deaths each year in the world are related to air pollution. In addition to the impact on human health, air pollution can also cause environmental degradation. How to raise environmental awareness is necessary to reduce air pollution. And importantly, the TPSR (The Teaching Personal and Social Responsibility) physical education curriculum focuses on cultivating personal social responsibility. How to design a physical education curriculum with air pollution environmental issues as the research purpose. In the course design, air pollution particles, PM2.5, acid rain, and fog are discussed. Through TPSR's pre-class relationship time, conscious conversation, physical activity, group meetings, introspection time, and relationship time, the six teaching processes are used to cultivate air pollution. Recognize and prevent pollution, and shift from responsibility levels such as respect, hard work and cooperation, self-direction, and helping others to care for the surrounding environment.

1. Introduction

Air pollution has a huge impact on basic human rights, such as the right to health, the right to life and the environment. For example, the latest assessment by the WHO International Agency for Research on Cancer (IARC) states that 7 million people in the world Early death is related to air pollution, in addition to the impact on human health, air pollution can also cause environmental degradation such as acid rain, haze, ozone depletion, crop and forest destruction, and global climate change. Although many countries have adopted many laws and regulations to prevent air pollution, air pollution is still one of the topics of concern for human climate change.

To improve education and raise environmental awareness is not only necessary but also important to reduce air pollution.¹ Physical education has always attached importance to cultivating students' roles and responsibilities in activities, especially through personal teaching and social responsibility (The Teaching Personal and Social Responsibility. The practice of TPSR) can help students learn how to take responsibility for the surrounding environment. Therefore, the purpose of this study is to give students the education of self and social responsibility through physical education and fulfill the responsibility of global citizenship for the protection of the earth.
The Teaching Personal and Social Responsibility Model (TPSR) is designed to cultivate a sense of responsibility and teach life skills that can transfer to a variety of environments. It provides a practical framework for physical education.[2] Diedrich (2014) pointed out that the research on TPSR physical education in the past few years has indeed made efforts to promote students' self-responsibility. Responsibility training has shifted to caring about other environments, and it is limited to produce responsibility benefits in interpersonal interaction in the subject. [3] Therefore, the main topics of this study are the following three aspects: (1) Understand the content of education courses on air pollution; (2) Understand the content of physical education curriculum design for TPSR and design writing.

In summary, there are two main issues discussed in this study.

(1) What is the current status of education curriculum design in understanding air pollution and environmental issues?
(2) What is the current status of PTSR's teaching in educational curriculum design?
(3) How to design air pollution environmental issues in the physical education curriculum?

2. Literature reviews

2.1 Research on Air Pollution Environment and Education

Air pollution has been a global problem in the past few decades. With the development of industrialization and the increase in population, air pollution has become one of the main environmental issues that people are concerned about today. According to the latest research, there are nearly 3.3 million premature deaths caused by outdoor air pollution each year, and the most important is in Asia, especially China, India and Southeast Asia. [4] Also, the US Environmental Protection Agency EPA reports that indoor air pollution is two to five times more than outdoor air pollution. The sources of indoor air pollution are mainly caused by outdoor air pollution, indoor second-hand smoke, kerosene, household cleaning products, pesticides, dust mites, and plasticizers. A recent Global Burden of Disease (GBD) survey found that indoor and outdoor air pollution accounts for fourth and ninth, respectively. If combined, air pollution may be the most risk factor. [5]

How to establish the issue of air pollution is integrated into the education curriculum. For example, to deeply cultivate environmental awareness in children ‘s minds, painting education is used to challenge children ‘s thinking [6] [7], and some teach students to use chemical tools to calculate. Air pollution components and explanation of air pollution sources [8]; some use social housing justice social courses to guide students on water and air pollution, climate change, deforestation, and global health, etc. Issues are integrated into the visual and performing arts [9].

It can be seen that air pollution issues are an important factor causing modern physical harm. Although air pollution environmental issues are mostly integrated into the curriculum, they are mostly confined to the design of indoor courses and concentrated on a few subjects. Environmentally conscious efforts still seem to be insufficient. Therefore, for the design of outdoor activity courses, the integration of physical education is the priority. Because physical education is a dynamic form of teaching activities, it is popular with students. For example, if air pollution environmental issues can be applied to physical education, environmental awareness and responsibility is nothing more than a good attempt.

2.2 Research on TPSR and Physical Education

To promote the value of whole-person education and strengthen socially beneficial behaviors, Clark Hetherington incorporated character education (moral, social, and personal development) into new sports in 1910. Subsequently, Don Hellison published "Beyond Balls and Bats: Alienated Youth in the Gym". To assist students to develop character in physical education, especially when facing personal and social problems, they can shoulder personal and social responsibilities and promote social harmony. Therefore, to establish students' sense of responsibility for protecting the environment, the personal and social responsibility teaching (TPSR) model is nothing more than one of the best teaching methods.
Diedrich (2014) pointed out that physical education teachers have been using personal and social responsibility (TPSR) teaching models as teaching strategies in sports programs to develop students' sense of responsibility. [11-14] Encourage students to take responsibility for issues related to their physical, emotional, and social needs. Besides, research by Escartí, Llopis-Goig, & Wright (2018) points out that teachers adopt the TPSR teaching model, and strategies for establishing a sense of responsibility are significantly related to students' demonstration of responsible behavior. [15] It is clear that although the activities of the physical education class are not only to improve sports skills, for the cultivation of social morality, TPSR's physical education is the primary method used by physical education teachers.

The use of TPSR in sports teaching trended to foster a sense of responsibility in sports, such as using water sports skills and the responsibility to build care for minorities (Beale, 2016); [16] also, some breakthrough the traditional use of sports skills as the traditional method to use health-related issues as the content of the curriculum and further develop health through physical activity. TPSR is used as a teaching strategy for health courses: In addition to cultivating student responsibility in the curriculum, the researcher states that students can also cultivate their social skills. From the research, it can be pointed out that Phtar is a teaching method to cultivate students' sense of responsibility in physical education. Secondly, the content of the course can be changed to other topics.

Schools should advocate experiential education methods to achieve the integration of knowledge and action, and subtly cultivate students' environmental awareness. Environmental education for students does not need to be limited to specific classrooms and prescribed class hours, and it is not necessary to explain environmental protection knowledge in a straightforward and naked manner. Instead, environmental education is hidden from these daily routines through campus facilities, management systems, school regulations, and school mottos, etc. After the activity, the moisturizing effect is achieved. Therefore, the integration of teaching methods on environmental education into physical education can not only promote students' physical fitness and physical fitness but also realize the importance of protecting the environment.

3. Course design philosophy

The problem of air pollution has a great impact on the environment and human health. On the education scene, physical education classes often outdoors are also harmed. Especially, when the air quality index reaches the red warning (151 ~ 200) of AQI, the school must use outdoor classes (Physical education class), outdoor teaching or observing activity course activities, adjusted indoors or postponed, when purple (201 ~ 300) / maroon (301 ~ 500), schools and kindergartens should cancel outdoor activities immediately and adjust the curriculum, such as indoors activities. Therefore, it seems that the future physical education curriculum can no longer allow students to enjoy their youth and enthusiasm in the blue sky.

The World Health Organization (WHO) released an air pollution map of the world in 2016. 80% of the air pollution is concentrated in the Asia-Pacific and Africa regions. This phenomenon highlights the industrialized social environment brings a lot of pollution, such as factories and automobiles exhaust gas, burning garbage, and haze have gradually discovered that air pollution will cause fatal harm to our health. The quality of the air is getting worse. The serious problem of air pollution causes physical education classes to be unable to normally attend. Each physical education teacher and school authorities are quite troubled. We must continue to compete between "exercise to maintain health" and "exercise in air pollution to endanger health". What are we supposed to do? If we can only teach children, physical education classes, indoors or in the corridor, can we use the TPSR teaching method to help students from physical fitness activities in a limited space, using the air pollution issue of environmental education, to let students learn to pay attention to the AQI signal. In addition to protecting yourself, you should increase awareness and responsibility for environmental protection in discussions and competitions, to improve students' physical fitness and knowledge of environmental issues.
Secondly, in the teaching steps of PTSR, through the five-stage teaching process of respect, effort and cooperation, self-direction, help and leadership, and migration, and the TPSR curriculum model implementation structure (critical time, cognitive dialogue, physical activity, group meetings), Introspection time) and implementation strategies (cognitive strategies, direct teaching, individual decisions, group decisions) to conduct air pollution environmental issues into the TPSR practical course.

4. Curriculum design results

This course designed some activities consists of 12 lessons, 2 lessons per week, and 50 minutes each. The focus of the course is air pollution and environmental issues. The main issues include suspended particulates, PM2.5, acid rain, and haze visibility. The discussion is based on motor skills. The situational setting, sports skills with a football, basketball, volleyball, and handball as physical activity items, teaching focus on TPSR level of responsibility, such as respect, hard work and cooperation, self-direction and help each other. Second, there are six activities in each lesson. Large stages, such as 1. Pre-class relationship time 2. Conscious conversation 3. Physical activity 4. Group meetings 5. Introspection time 6. Relationship time.

Course theme: Air Quality

Teaching objectives: The teaching goal includes Cognitive domain, affective domain, and Psychomotor domain. They are described separately as follows. Cognition domain: Understanding air is a valuable natural resource and introducing the sources and prevention measures of air pollution in the common sense so that learners understand the dangers of air pollution and analyze the causes. Affective domain: Cultivate students' awareness of protecting the environment. Psychomotor domain: develop students' skills to protect the environment.

| Air pollution issues | week | content | TPSR responsibility |
|----------------------|------|---------|---------------------|
| Aerosol | 1-1 | Football warm-up and dribbling skills Basketball-High Pressure Dribble and Stability Training Volleyball catch | Level of responsibility-respect |
| PM2.5 | 2-1 | Basketball-High Pressure Dribble and Stability Training | Responsibility level-hard work participation and cooperation |
| | 3-1 | Volleyball catch | |
| | 4-1 | Passing, shooting, basic offensive, and defensive footwork | |
| Acid rain | 1-2 | Passing, stopping, controlling and shooting | |
| | 2-2 | High-pressure forced dribble and coordinated training | |
| | 3-2 | Volleyball pass and delivery | |
| | 4-2 | Handball assist | |
| | 1-3 | Passing, stopping, possession, drop and header | Level of responsibility-self-directed |
| | 2-3 | Rope ladder shooting coordination training | |
5. Conclusions and recommendations

The awareness of environmental protection is rising, and the content of education is constantly expanding. Physical activities are aimed at practicing the social, psychological, and physical health of the whole person. Physical education should keep pace with the times and should not be excluded from education and environmental protection teaching. Take responsibility for protecting the environment and maintaining good health. Therefore, the integration of air pollution issues into physical education activities will make physical education teaching more diverse and meaningful. Secondly, the PTSR teaching model focuses on cultivating moral responsibility and learns from sports activities on how to care for peers and transfer responsibility for the surrounding environment. Finally, there are two points in the curriculum design suggestions: First, the curriculum design is based on air pollution, so the simulation of environmental pollution should be guided by multiple questions and applied in sports activities on how to care for peers and transfer responsibility for the surrounding environment. Secondly, in the activity stage, the discussion of environmental issues is the main point in the pre-class relationship time and group meetings, and the introspection time is based on the important design of environmental protection and new responsibility training.

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