

---

# *INTERNATIONAL JOURNAL OF SCIENCE ARTS AND COMMERCE*

---

## **The STSE Education Concept in Physics Teaching**

**Ting Tang 1 and Zhaojin Feng 2**

Physics and institute of space science, China West Normal University,

Nan chong, Si chuan province, China.

---

### **Abstract:**

*STSE based on the concept of STS education, is the complement of STS education concept and sublimation. It is pointed out that environmental education is an important part of civil scientific literacy education. Based on the experiment of physics, energy, sound and light four parts carries on the analysis, to explore how to STSE concepts of environmental education into physics teaching activities in appropriate and effective.*

**Key words:** STSE education, fuse, education, physics.

### **1. To STSE education preliminary understanding**

At present, the global climate warming, land desertification, ozone depletion, acid rain, shortage of energy and so on a series of serious problem threatening human survival and development, thus to cultivate the students' environmental awareness is the top priority in today's education circle. The original concept of STS education can not adapt to the new requirements of the society, now STSE concept of this new type of education can develop. STSE focuses on science, technology, the relationship between social, environmental, attaches great importance to the science and technology in social production, living environment and the role of social development.[1]

### **2. The overall analysis of the high school physics teaching material**

High school physics textbook chapters one section specially emphasized the relationship between science, technology and society, carry out the idea of STS education. But for the environmental protection education, teaching material did not explicitly pointed out that the STSE education ideas into practical teaching activity effectively. At present world situation is very serious environment problem, high school students must understand the importance of environmental protection and master some necessary measures to improve the environment, this

requires a high school teacher can be found in the teaching material and environmental education fusion point, in the teaching process will subtly environmental protection consciousness rooted in the minds of students.

### **3. Look for environmental education integration point in the teaching material**

#### **3.1 The experiment**

3.1.1 The analysis of the teaching material. Study requires teachers completed the two teaching goal, one hand it is a teacher to collect some relevant information or make some interesting experiments for students to observe some amazing physical phenomena and stimulate their interest in learning physics, let it realize the importance of scientific inquiry; on the other hand it is to let students understand the method of scientific inquiry laboratory and encourage them to build a family. But it has not to STSE education concept in it, ignore the importance of environmental protection.

3.1.2 Searching for the fusion point of environmental education. Teachers can collect some of some old items in life, it is converted into some interesting or experimental instrument related to the teaching content, students are encouraged to set up small family laboratory safety, and guide them to explore or validation experiments. While doing the experiment part explain for old items throw will have a big impact on the environment. Such as China Daily use polyethylene material of plastic bags, water bottles and other plastic products about 3 billion, less than 10% it recycling, processing more difficult. If the rubbish scattered in the environment, can cause "white pollution", influence city, attractions integral aesthetic feeling; Mix in the soil, take 200 years to completely decompose, cannot serve as crop fertilizer, not only affects the crops absorb water and nutrients, eventually led to the agricultural production, and will waste a lot of land, thus affecting the sustainable utilization of land and the development of industry and agriculture; Burning will release a large number of poisonous and harmful gases, endanger wildlife and human safety.[1]In this way, not only can stimulate their interest in learning physics, enhance scientific inquiry ability also strengthened their "into" the environmental protection consciousness.

#### **3.2 Energy**

3.2.1 Analysis about the present situation of China. At present, Our country is the world's only with coal as the basic energy superpower. In one-off energy consumption, coal for use of more than 75% of the total energy. Because the one-off energy such as coal, oil generation time is long, fast consumption, predictions agree that the energy structure of China will be up to 60 years. So finding development and rational utilization of new energy, is China's on the way of development is an urgent need to solve the problem.

3.2.2 Searching for the fusion point of environmental education, In the interpretation of the new energy, the teacher can explain the commonly used some of the problems of energy, such as

commonly used energy needs tens of thousands or even hundreds of millions of years to produce, consume fast and one-time energy supply of energy efficiency is very low; More than small and medium-sized enterprises in our country, the technology is relatively backward, in the production process after one-time energy use of a lot of dust and harmful gas untreated direct emissions into the atmosphere, caused serious environmental pollution. At the same time also can explain the cause of haze and harm, let students understand atmospheric pollution has crisis in human's life. Can the other teachers and students discuss some analysis because of excessive exploitation and use, the energy depletion caused by the energy problem, so as to inspire the student to the new energy of exploratory, this can not only improve their environmental protection consciousness can also increase their interest in learning of new knowledge.

### **3.3 Voice**

3.3.1 The analysis of the teaching material. Teaching materials mainly describes the generation, transmission and its properties of sound, make the students understand the ordinary life also contains many physical knowledge, increase students interest in learning and exploring spirit.

3.3.2 Searching for the fusion point of environmental education. Thanks to the development of modern science and technology, we live in a variety of "noise pollution", they are very big to the harm of human body. As some of the factory workshop, deafening rattle comes, if long-term working in such an environment, can make the person hearing serious damage, such as deafness, headache, hypertension disease. So some workshop set up sound barriers, some workers have to work with headphones workshop requirements, some factory is built to these mechanical specialized sound workshop. Cars and aircraft is one of the important traffic tools in today's society people, but in the main roads and airports around the people live and work at the same time of enjoying life they bring convenience, also have to endure the "noise" of their pollution, especially the sound of the jet aircraft takeoff, up to 140 ~ 140 decibels. Under such a high decibel noise, ear rupture hemorrhage, will eventually loss of hearing. So the teacher can find material from everyday life in the environmental protection education into the teaching process.

### **3.4 Light**

3.4.1 The analysis of the teaching material. Students mainly to master the basic concepts of light, reflection and refraction properties and concave convex mirror, the imaging rule of concave and convex lens, Also describes the structure of the eye, the causes of the formation of nearly far-sighted and rectified. Fully shows the relationship between science, technology and society. But was not involved in the relationship between the light and the environmental protection.

3.4.2 Searching for the fusion point of environmental education .With the development of science and technology, people more and more understand the importance of environment for human health. People more focus on water pollution, noise pollution, environmental pollution, air pollution, etc., but ignore the "light pollution" of the severe impact of the human life. Due to the progress of science and technology and the development of city construction, life need to

mirror used for the construction and interior decoration, ceramic tile, white white wall, such as more and more, close reading and writing of books and paper used students is becoming more and more smooth. But people long in such a "weak light color" artificial visual environment, all kinds of eye disease incidence is higher and higher, especially short sight. According to statistics, China's contemporary high myopia rate is as high as more than 60%, ranking second in the world. So the teacher can introduce students to the meaning of "light pollution" and explains its harm to human body health. Such as: according to the scientific determination of general white white light reflection coefficient of 69% to 80%, and the light of the mirror glass reflection coefficient is 82% to 88%, and easy to be overlooked book of white tissue paper light reflection coefficient is as high as 90%, and this value is far higher than the physiological adaptation scope of the human body can withstand. Higher than the green plants and the surface of the hair ornaments about 10 times.[3]These will constitute the "light pollution". After a long time, can cause harm to the human eye cornea and the iris, inhibition of retinal photoreceptor cells function, cause eyestrain and decreased vision. Studies show that the fluorescent frequent blinking will force the pupil frequently scaling, cause eye fatigue. If long time by the strong light stimulus, leads to retinal edema, fuzzy, serious damage photoreceptors in the retina, affect vision. Explain to the students to stress the importance of the eye, at the same time the right eye and read and write. Such as: to read and write, not nbeing too close to the book; Don't lie or reading in a moving car, pay attention to posture when reading and writing. Don't watch TV for a long period of time and the mobile phone, free time is often beyond the and green plants, reduce the fatigue of eyes, carefully to do eye exercises. [4]

#### **4. To summarize**

Through study and analysis of high school textbooks, I don't think every day for each chapter to environmental education of students, and can find the proper blend has become a success in the teaching into the key of the education of environmental protection. Education way is also varied at the same time, teachers can display pictures, play video, speak news methods such as case to student popularization STSE education in the education of environmental protection, can also give students after-school survey assignment, arrangement of team cooperation, communication and game teaching method, lets the student independently knowledge learning.

#### **References**

- [1] Hu Weijian. Applying STSE activities of scientific teaching research [D]. 2013.5.28
- [2] farewell transparent - plastic pollution is limited to [J]. Sunset. 2008.2.27
- [3] vigilance indoor light pollution "off" the reflection coefficient should be less than 60% [J]. Journal of qilu evening news. 2010.08.06
- [4] [M]. The days of the "physical" eighth grade education science press. 2012