

Research on Education Status Quo of Implementing STS in Physical Teaching of Hebei Province High School

Tang Yongguang, Gao Lingling

Department of Physics and Electronic Information, Langfang Teachers College, Hebei Province, China
tygtg@163.com

Abstract - Based on the questionnaires, this essay clarify the education status quo of implementing STS in physical teaching of Hebei Province high school, propose 5 problems and solutions as follows: the knowledge reservation of teachers, STS examples in education materials, changes of the test and evaluation functions, students' initiative and positive, and facilitating the sciatic education intergradation.

Index Terms - Physical education, STS education, Status quo

The new course standards propose a basic idea for the general high school physic programme: "In the content of high school physic module... we should enhance the relationship between the course content and the students' life, modern society and science and technology development, follow the social problems brought by physical technology application, and foster the students' responsibility to the society". Among this three-dimension teaching aims, it also offered a correspondent expression on STS education: in knowledge and technical aspect, we require the students "...could explain the nature phenomenon and practical problems in daily life"; In the procedure and method aspect, we require the student to try to "...resolve the practical problem they met in daily life"; In emotional attitude and sense of worth aspect, we require the student "...cultivated a thinking mood of physical application in practice"[1].

In order to research implementing STS education in physical teaching in high school of Hebei province, I particularly carry out an investigation for students and for teachers respectively, and trying to reflect the status quo of implementing STS in physical teaching in domestic high school.

Some of the questions of questionnaire in the survey are coming from the reference[2], and some are created by myself by referring to the physical periodicals.

1. Survey for High School Student

This survey is accomplished in October, 2011, the academic background of the respondents are new education system receivers 2 years and the traditional education receivers 3 years. Totally sent 68, 70 and 76 copies of questionnaire in each grade, and got 66, 67 and 71 effective questionnaires respectively, and reached the effective rate 97.1%, 95.7% and 93.4%.

We have got many meaningful conclusion from this survey: the STS education implementing in middle school are better than in high school, about 30 or 40 percent of students are not interesting in physics, which showed the necessity of

the revolution. Although the students do not know about STS, they clearly demand to change the teaching content, and asked to relate the course teaching with practical life, desire to learn more popular science knowledge, that reflect their hope of making course content more open and more comprehensive.

Besides of facilitate society development, most of the students have realized the negative effect brought by the science and technology. In practice and experiment, they have ideal attitude but sufficient ability. They normally have good teamwork spirit, pay attention to the classical social problem that related with science and technology such as environmental protection, but the scientific knowledge for these problems are far from enough.

2. Survey for High School Physics Teacher

All of the respondents in this survey are coming from high school of Hebei Province, among which, key school teachers accounts for three quarters, and ordinary school teachers accounts for one quarter, most of the teachers are elite in their school, 87.5% of the teachers have more than 10 years' experience. The questionnaire are sent and received by email, totally sent 36 copies and received 32 effective questionnaire which make effective rate 88.9%.

The survey shows: after implements the new course aim in Hebei Province, still 40.6% teachers are not satisfied to the status quo of high school physics education, and 56.3% of teachers believe that the key factors of implementing STS is reform the exam system. In the initial stage of applying STS, exam will exert important influence. During implementing the new course standards, some of the teachers have gradually accumulated their experience and developed their own view of points, although not in system, shows that Physics STS education starts. The teachers have ideas, suggestions and also actions to STS education.

3. Thinking and Suggestion

A. Teachers' knowledge reserve

Implementation of STS education, teachers should have rich knowledge reserve of STS. Many teachers don't have sufficient knowledge reserves. In teaching practice teachers' channel of acquire STS knowledge are roughly the same as students, such as newspapers, books, television and the Internet. Compared to students, teachers have no advantage at all [3]. To solve this problem, we recommend that education department to provide the necessary training for teachers, such

as the key teacher training, STS education teacher training, or other short-term training, so as to enrich teachers' knowledge of STS education through training.

B. Emphasis on issues of STS materials in textbook

For most of the teachers, ideas between traditional teachings and the new course standard, and meanwhile facing pressure of students' short-term goal of college entrance examination and long-term goals of promoting their lifelong development. While holding in hands of the new curriculum which has a distinct position and rich STS materials, yet often neglect utilization of them. Teachers may think that implementing the STS education in new course standard is a very difficult task, they are more accustomed to their own professional areas. Therefore, the training for teachers is not only focusing on STS knowledge, but more important is constantly emphasized and reiterated STS education. Like the teacher of students' habits education, let teachers in the lifelong learning in STS education, deepening awareness. Make full use of the existing conditions, to create conditions for the implementation of STS education.

C. Test evaluation changed both function and form

In the initial stage of implementing STS in practical work, the guide of test evaluation is required. The test for the assessment of STS education is different from the traditional science education. Traditional evaluation and test are based on the purpose of selection and promotion of students. While in STS education, the main function of evaluation and test is offering decisions and improving teaching [4]. In STS education, students improve learning, teachers improve teaching and managers improve management based on the test result. In the test evaluation form, STS education should highlight the process evaluation. Teachers adopt open, diverse ways of evaluation in the process of education, such as reading notes, extracurricular experiment, subject research, and other specific project evaluations.

D. Don't increase students' burden, protect the students' enthusiasm

Reform and change courses or teaching methods should not increase the burden on students as the priority. Deviate based on school education, family expectations are too high and the social employment pressure increases, adding other factors, students are learning under lots of pressure therefore lost their motivation. Implementation of STS education in the current situation, also need to consider the short-term goal of college entrance examination. Don't increase burden on

students, protect their enthusiasm, these should be the premise of implementing STS education.

E. Establish Science Pedagogy, promote the integration of Science Education

The existing arrangement which makes subject teaching as the teaching center, STS education has not become a main line, the implementation of STS education can only take the course of osmotic way. With deeply implementing STS education, curriculum organization will no longer be confined to subject boundaries, and to cross-disciplinary, integrated direction. Different from the general science in the college entrance examination, here integration is stressed all science courses' combination. One of the effective ways to realize integrate all science courses is to establish Science Pedagogy in university, build open and flexible teacher training system.

4. Prospects

With the implementation of new curriculum standard, STS education has been getting more and more attention, but its development is still facing problems:

Reform the examination system is a key factor to implement STS education. In the primary stage of the implementation of STS education, exam oriented role is very important. The reform of the course are lagging behind compared with the college entrance examination system reform, this may make the teachers' psychology and behavior conflict, although aware of the importance of STS education but in handling materials it's still be left out.

Implementation of STS education, it needs the joint efforts from school, family and community to handle the relationships well between student's lifelong development and short-term objectives of college entrance examination. This is a question that worth seriously consideration of educators.

Due to the open and dynamic characters of STS education, educators should always bearing in mind and explore and summary the issue below, how to build a STS education system both conducive to students' individual and social development.

References

- [1] Ordinary High School Physics Curriculum Standards, People's Education Press, 2003.
- [2] Y Liu," A Research on the Infiltration of STS Education into Physics Teaching in Senior Middle School," Master's thesis, Hunan Normal University,2006
- [3] Y. Wang and H.Sun, "The Investigation and Analysis on Professional Knowledge Structure of High School Physics Teachers in the New Curriculum, Physics Teacher," vol.26, no.2, pp.1-3, 2005.
- [4] P.Sun, "Theory of STS Education," Shanghai Education Press, PP. 333, 2001.