Current Situation and Improvement Strategies of Science Literacy Education for Primary and Middle School Students

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Abstract: Under the background of China's continuous education reform, the science literacy education of primary and secondary school students in China has made continuous progress, but there are still many problems to be solved in the actual teaching activities. This paper analyzes the current situation of science literacy education of primary and middle school students and puts forward the corresponding improvement countermeasures. The content of the paper can be used as a reference for peers, hoping to contribute a strength to the cause of education in China.

1. Introduction

The new curriculum concept puts forward that teachers should not blindly care about students' academic performance when conducting educational and teaching activities for students, but should make students continuously increase their overall quality while learning knowledge, so as to promote the healthy development of students. Therefore, in order to improve the overall quality of students, science literacy education is essential. Based on this, the research in this paper is of great significance for the current situation of science literacy education in primary and secondary schools and the corresponding improvement strategies.

2. Problems in science literacy education in primary and secondary schools

2.1 In the teaching activities of scientific literacy, emphasis is laid on the transmission of knowledge and conclusions, while students' independent inquiry is ignored

In the scientific literacy education of primary and secondary schools in China, there is a common phenomenon that teachers pay attention to the impart of their own knowledge and ignore the initiative of students, and fail to respond positively to the new curriculum concept in China [1]. In the new curriculum concept of our country, it is emphasized that teachers should take students as the main body in teaching activities, fully mobilize students' own knowledge reserve, enable students to use their own knowledge to solve the corresponding problems, and guide students to build their own knowledge system. But in the real education activities, because a large part of the teachers has long been the bondage of the traditional teaching ideas, therefore, when carrying out scientific literacy curriculum education activities for primary and secondary school students, they always impart the relevant knowledge of scientific literacy in person, so that students cannot think fully in class, and follow the teacher's steps all the way, which is very easy to appear in the form of one person talk. In the long run, the classroom of scientific literacy shows the current situation that teachers teach knowledge by themselves while students explore knowledge by themselves. Based on this situation, when learning relevant knowledge and concepts, students can only passively accept them and forcibly memorize relevant concepts of scientific literacy, without truly understanding the meaning of scientific literacy. As a result, students only blindly believe in scientific truth and only have a partial understanding of many phenomena.

2.2 The relatively old scientific system is still cited, which belittles the new development of disciplines and technologies in China

China's science education system for primary and secondary school students generally has strong

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logicality, and has obvious advantages in the level of science literacy courses, but this is also a major drawback of China's science system. When teachers transfer the related knowledge of scientific literacy to students, they pay too much attention to the scientific system, but neglect the humanistic literacy and other contents in scientific literacy. Among scientific literacy knowledge, many knowledge are too difficult and partial, and teachers cannot guide students' understanding of the thinking process of scientific discovery in teaching activities. Although China is constantly pushing forward the reform of education and putting forward a series of new ideas about education, there are still some practices in the actual science education, such as paying too much attention to the science education system and ignoring students' idea of scientific literacy knowledge. Moreover, in most primary and middle school students' science literacy teaching classes, they cannot timely and quickly reflect the achievements of China's relevant scientific and technological development. For example, nanotechnology and human genome technology are hardly seen in science literacy classes of primary and secondary school students [2].

2.3 Attach importance to the practical value of scientific research, and despise the experience of scientific research

In the case of scientific research, every scientific research is ultimately successful after thousands of experiments and improvements. Scientific research requires not only professional knowledge but also correct thinking and cautious attitude. However, when carrying out scientific literacy teaching activities, teachers often ignore the process of scientific research and directly convey the content of scientific research to students. They seldom explain the process and stories of scientists' scientific research activities, let alone introduce the background of related scientific research activities. Therefore, students only know what many scientific research activities are but do not know why. Therefore, the scientific literacy education of primary and middle school students often attaches importance to the achievements of scientific research and ignores the experience of scientific research. As a result, students are unable to understand the real process of scientific research activities and the solutions to many contradictory problems in scientific literacy. In most cases, the accumulation of scientific knowledge is just a rote learning of scientific conclusions, which cannot improve their scientific literacy in a real sense.

3. Strategies and Suggestions for solving problems

3.1 Planned changes shall be made to the content and form of middle school entrance examination and junior high school entrance examination

As we all know, the entrance examination content of annual high school and junior high school is the bellwether of the whole education industry. Therefore, if we want to use teaching evaluation to promote scientific literacy education, then we must carry out planned reform on the content of middle school entrance examination or junior high school entrance examination. Taking scientific literacy as an example, we should be more comprehensive in the assessment of relevant content. For example, in assessing students' knowledge related to scientific literacy, their scientific spirit and ability to apply scientific methods should also be constantly strengthened, and their understandings in learning scientific literacy should be assessed. At the same time, attention should also be paid to students' comprehension in the science literacy class and their practical ability in daily life. In addition, a series of competitions should be carried out for science literacy courses, so that students can conduct self-explorations on science literacy knowledge. When teaching students, teachers should constantly cultivate students' scientific literacy and connect it with other subjects, so as to comprehensively improve students' quality.

3.2 Advocate the teaching and learning method centering on scientific inquiry

As we all know, when learning scientific knowledge, we should take independent inquiry as the center. Students' independent inquiry is not only the purpose of teachers' scientific literacy teaching, but also the way of students' scientific learning. In addition, independent inquiry is more conducive

to students' grasp of scientific knowledge, and is also the most important way for students to carry out scientific activities. In the process of independent inquiry, students should not only learn to ask questions, but also learn to solve problems, and have a deep understanding of science courses. Thus students can fully mobilize the ability to use their hands and brain, and improve their thinking ability. The continuous improvement of their own scientific system will ultimately improve students' scientific literacy [3].

3.3 Conduct scientific literacy education for students in different levels

When carrying out scientific literacy teaching, teachers must concern all students and learn to arrange teaching contents in different levels to teach students in accordance with their aptitude fundamentally so that each student can effectively improve their scientific literacy. Only by making students realize the value of scientific literacy in teaching activities, can students attach importance to scientific literacy and keep exploring, and ultimately improve their comprehensive quality.

3.4 Use a variety of ways to improve teachers' scientific literacy

Teachers are the leaders and organizers of science literacy classes. In addition, teachers are also partners of students in science learning. Therefore, teachers should constantly improve their own scientific literacy ability, only in this way can ensure that teachers can always lead students to learn [4]. For example, schools can adopt lectures and other forms to enable teachers to continuously improve their teaching ability under the new curriculum concept. The teacher must fully consider the student's study condition, according to which they improve teaching method and the content unceasingly. In addition, on the basis of the content of textbooks, teachers should learn to constantly introduce new scientific events in China, so that students can understand and accumulate the national scientific knowledge, and ultimately improve their scientific literacy and the comprehensive quality.

4. Conclusion

When teaching the relevant knowledge of scientific literacy in primary and secondary schools, teachers should first attach importance to improving students' independent inquiry ability, and should constantly strengthen their own scientific literacy. Teachers should teach students in different levels according to the situation in class, so as to continuously improve each student's scientific literacy and promote the all-round development of their quality.

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