Science Laboratory Classes for Freshmen in Tohoku University

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Tohoku University regards laboratory class as an important part of the curriculum for freshman. Experimental classes were a part of the course in physics, chemistry, biology and earth sciences in order to give training in basic laboratory skills in each of these fields. However, in the 21st century, the classes have gradually begun to lose their effectiveness. In this report, we present the new classes of the science experiments that have been developed for more than ten years.

In 2004, Tohoku University started a new introductory experimental science class for freshmen in order to recover the problems. These classes are intended to aid students in thinking logically and in understanding of the fundamental concepts of natural phenomena. For those purposes, we combined physics, chemistry, biology and earth sciences and set up five themes entitled “Life, Energy, Earth and Environment, Materials, and Science and Culture.” We have also developed the teaching methods and the management method of the classes. Every year, more than 1,600 students of science related undergraduates attend the classes.

We have estimated the educational effects using the students’ grades as well as the questionnaire by students. As results, 60% of the students showed high interest and believe that they have mastered the following three items: how to think logically, the importance of being interested in unknown phenomena and how to write scientific reports.

In 2007, Tohoku University opened a new laboratory class for liberal arts courses. By attending the laboratory class, we expect the students to learn that the modern society can’t exist even for a day without scientific and technological achievements. It is not possible to ignore the enormous influence of science and technology, to build or image a future society. In 2012, we offered a laboratory class taught in English for foreign students.