

## Summary

### Practical Study to Improve Science Education in Junior High School: Enhancement of Interest in Science

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Advances in science and technology are one of the major factors in globalization. In a global society, it is important to join and function effectively in socially heterogeneous groups and to use knowledge and information interactively. In this context, individuals will also require the ability to identify and solve problems and implement their solutions on the basis of scientific evidence. Thus, science education needs to promote interest in science, which enhances students' motivation to utilize scientific concepts and improve their scientific thinking and inquiry skills.

Although there is a unit called "Science and technology and human beings" in the Japanese course of study for junior high school students, Japanese students' conceptions of the usefulness of science for their possible future jobs in science and of the general value of science for human beings and societies are relatively negative, as shown in many studies such as the PISA (Program for International Student Assessment) surveys of education in various countries. Thus, development of the Japanese science curriculum in this regard is crucial for the improvement of science education in Japan.

In this study, I focused on students' interests in science, in scientists, and in the progress of science and technology. More specifically, I examined the effects of programs introducing profiles of scientists in third-year science classes at the Junior High School of Ochanomizu University in Tokyo.

#### Chapter 1 Promotion of Interest in Science through a Program Introducing a Profile of Scientist Charles Darwin

A program introducing a profile of Charles Darwin to students was implemented and changes in students' interest in science class and scientists as a result of the program were investigated. The results suggested that this program increased interest in scientists not only for students with higher initial interest in science but also for those with lower initial interest.

## Chapter 2 Promotion of Interest in Science through a Program Introducing Profiles of Three Famous Scientists

A program introducing profiles of three famous scientists was implemented in the biology unit of a science class, in order to determine whether it would increase their interest in science and/or in scientists. The program was found to increase interest in science for students with lower initial interest in science and to increase interest in scientists for those with higher interest, but not to increase interest in scientists for those with lower initial interest in science or interest in science for those with higher interest.

## Chapter 3 Raising Motivation for Science Class through Three Activities Involving Scientists

This practical study involved the implementation of three activities: one in which a teacher introduced profiles of scientists in combination with an experiment, one in which students introduced profiles of scientists as class presentations, and one involving a special class conducted by working scientists. As a result of these activities, the students' interest in the progress of science and technology and their motivation for science class were maintained at a generally high level. In particular, the classes that involved the introduction of profiles of scientists by the students and by the teacher in combination with an experiment were effective in increasing students' interest.

## Chapter 4 Effect of a Program in Which Students Themselves Introduced Many Profiles of Biologists Born Between 1400 and 1899

In this study, students themselves studied many profiles of biologists born from the 15<sup>th</sup> to the 19<sup>th</sup> centuries and presented them in science class; as a result, among both the students who gave presentations and those who watched them, interest increased in science, in scientists, in the biographies or stories of scientists, and in the progress of science and technology.