

A Distinction between Universality and Particularity of Things in Science Teaching

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This presentation introduces a science teacher's attempt to nurture the scientific worldview in students' minds in a primary science lesson for the fifth grade in Japan. There, the Japanese language is the medium for instruction and is also students' first language. However, this language is unsuitable for expressing scientific concepts, because it does not have any fully established method of composing abstract nouns that play a critical role in scientific thoughts and expressions. Acquiring the Japanese language as their first language, students internalize the Japanese worldview different from the scientific worldview based on the dichotomy between the world of Idea and the phenomenal world. After the teacher fully realized that the Japanese language is unsuitable and that complementary explanations are necessary for expressing scientific concepts in the Japanese language, the lesson, of which content is that there are males and females among fishes, was conducted. In the lesson which began with observing several killifishes, the teacher led the students in an abstraction activity. They gradually divided the killifishes into two groups, males and females, disregarding individual differences. Although the same expression is used for an individual killifish and the two groups in the Japanese language, the teacher unceasingly drew students' attention to a difference in concept between an individual and the groups. This process for abstracting will be the first step for Japanese students to learn the scientific way of thinking.