A collaborative project between elementary school teachers and university teachers in teaching about earthquakes

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1. Introduction

It is very important that seismologists and earthquake educators assist the teaching about earthquakes in collaboration with school teachers and the staff of social education organizations in order to spread the knowledge and understanding of earthquakes, disaster prevention and reduction of harm and damage for ordinary people and students. The purpose of this study is to indicate that a teacher of an elementary school can successfully teach the knowledge of earthquakes using seismographs to students in collaboration with a seismologist through practical class at an elementary school. Another purpose of this study is to develop guidelines for elementary school teachers to teach about earthquakes using seismographs for 6th grade students.

2. Outline of the practical class

Participants: Twenty one 6th grade students (eleven to twelve years old) at Oshima Elementary School which is run by the Joetsu Municipal City, Niigata Prefecture.

Date and time of the class: The 5th and 6th class times from 14:00 to 15:45 on the 27th of October, 2006.
Subject name: 'Period of Integrated Study' (Special lecture and lab entitled 'Structure of Oshima area, disaster prevention for landslides, and earthquakes')

Class description: The class is divided into 2 parts;
Part 1: Lecture class entitled 'The natural environment, the landscape, and disaster prevention at Oshima area' by Ishida, H. between 14:00 and 14:20.
Part 2: Lab class entitled 'Using seismographs in learning about earthquakes' by Nemoto, H. between 14:25 and 15:45.

Class objectives;
1. Learn about the general geology in Oshima area.
2. Understand how seismographs work and their sensitivity.
3. Understand the meanings of amplitude of waveforms.
4. Recognize a velocity of seismic waves.

Equipment available:
Three components short-period 1Hz velocity seismograph with a portable PC as a data logger. Pickups and a data logger, McSEIS-3. Tape measure (50m). Hammer. Writing materials. Calculator.

Questionnaire survey:
A questionnaire survey was given to the students to find out the level of student understanding after the class had been taught.

3. The results of the questionnaire survey

Results indicate that many students were able to understand the mechanism of a seismograph and its sensitivity. They were also able to find out the meanings of amplitude of seismic waveforms. However, regarding a velocity of seismic waves, few students (about 10%) were able to explain their understandings. We thought that this may be because students concentrated on calculating the observed data rather than focusing on understanding the meaning of seismic wave velocity. Verifying the assumption, we interviewed some students several days after the class. The interview almost confirmed the above mentioned assumption.

4. Conclusions

This study suggests that collaboration between elementary school teachers and university teachers can be very effective in conveying the knowledge of earthquakes using seismographs to elementary school students. The study shows that involving students in the practical class makes the subject of earthquakes more interesting to them and enhances their learning abilities as well. However, more effort can be done to improve and develop teaching methods.

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