

How does the understanding of volcano advance? ; An example from the experiment on forming stratovolcano

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Experiment on Polygenetic stratovolcano using waste food oils and colored sands (Kasama et al. , 2010) was demonstrated at grade schools to high schools in Kanagawa prefecture and Shizuoka prefecture. Two cross section pictures of stratovolcano were drawn by many students. One is a imagination sections before experiment and another is a sketches after experiment. These pictures were divided into several types by inner stratigraphy (Kasama, 2012a) and had a tendency corresponding to age (Kasama, 2012b). Furthermore, many educational practices have done from 2012 to 2014. Many data from 1409 people have obtained. According to the result, it becomes clear that the tendency corresponding to age, residential area and scientific interest of volcano, especially Mt. Fuji. The experiment type (ET) was drawn by lines changed from lower horizontal lines to upper tilted lines. ET was found in the experimental stratovolcanoes and was considered to be exact depiction. Textbook type (TT) was drawn by piling similar triangles. Horizontal type (HT) was drawn by horizontal lines like stratum (Kasama, 2012a).

Fig.1 shows a relation between horizontal type drawn before experiment (HTB) and experimental type drawn after experiment (ETA). They had negative correlation. ETA indicates observation capability. ETA increases with age. HTB indicates misunderstood prior knowledge. Misunderstanding was thought to be caused by the education of the stratum of the 6th grader. Because HTB was not so high at the 3th to 4th grader, but the 6th grader was highest of all. There was found no HTB in a science club which consisted high school and junior high school students, Kanagawa. But, teachers of elementary school of Kanagawa drew same HTB, and ETA did not beyond the high school students. It is an important problem that we must think about.

TTB and ETA had correlation. TTB indicate right back ground but it is not so exact. ETB and ETA also had correlation. ETB is thought to be the best expectation, but its proportion was low.

How to write outside slope lines of stratovolcano is divided into three types. Simple straight lines (SL) which like the side slopes of a scoria cone, convex curves (CV) which like the side slopes of a lava dome and concave curves (CC) which are suitable for the slopes of a stratovolcano. Ratios of three types were not so much depended on age, but heavily depended on arias in which students live. Many students living in Shizuoka prefecture wrote concave curves before experiment (CCB). A high school at Shimizu, Shizuoka indicated the highest CCB ratio. It was thought that students can see Mt. Fuji and its frank easily.

References

Tomohiro Kasama, Daiji HIRATA, Shuichi NIIDA, Hiroyuki YAMASITA and Saeko ISHIHAMA (2010) Development of Experiment on Polygenetic Volcanoes Using Waste Food Oils. *Earth Science Education*, 63, 5.6, 163-179.

Tomohiro KASAMA (2012a) Cross sections of stratovolcanoes drawn by sixth grader. Japan Geoscience Union Meeting 2012, G02-P-9, Chiba.

Tomohiro KASAMA (2012b) Cross sections of experimental stratovolcanoes drawn by students of various age. The Geological Society of Japan Meeting 2012 Osaka, R19-O-8.

Keywords: experiment, stratovolcano, cross section, Mt. Fuji, children and students, teachers

G02-P02

Room:Poster

Time:April 29 18:15-19:30

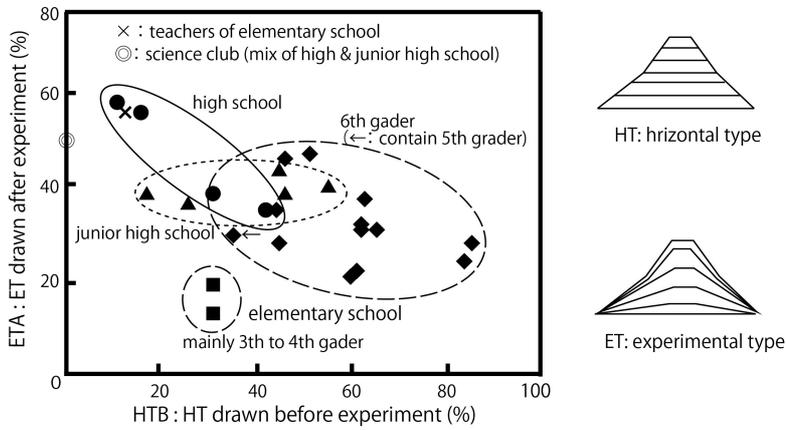


Fig.1 An analysis of pictures, showing a correlation between HTB and ETA.