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# Understanding the Process of Co-construction of Scientific Models in Geological Field Trips.

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Co-construction of scientific modelling is the one of the most appropriate methods to explain geological phenomenon when observing an outcrop on a geological field trip. It is necessary to make meaning with peers through co-construction. In science classes, students used an exploratory process to create scientific models through both small group activities and whole class interactions. In this process, the scientific model is not obtained by accident. The students create models based on data and resources from diverse sources. For these reasons, it is necessary to understand what information student's use in the model co-construction process and explore students' use of information in terms of constraints. The term 'constraint' is used in the broader sense to include almost any item of information, any more or less established or accepted law, principle, rule or fact, which helps to set the problem by imposing a condition on its solution [1]. The purpose of this study is to understand the processes of co-construction of scientific models during the geological field trips focusing on these constraints.

The study included five sessions which included two field trip sessions and three modelling sessions involving the Gwanak Mountains and were conducted with three classes of middle school students divided into 3 groups from the "S" Education Institute for the Gifted in Seoul. In the field trip sessions, students were accompanied by their teachers and received guidance for site observations. The teacher described each place based on the observations of the students. Later in the modelling classes, the teacher provided students with information unobserved during the field trip and provided materials for them to observe. Then students had group discussion time to compose the group model. After class, group members were interviewed. All classes and student activities were video-taped, voice recorded and transcribed. Student's personal and group activity reports were also analysed.

The results were as follows. Firstly, all groups used six to seven constraints when they made their model. The sources of constraints used by the groups for the model formation were (1) previous experience, such as content from classroom sessions and assignments, (2) content observed by students during the field trips, (3) related phenomenon to be explained by the target model during modelling sessions.

Secondly, they used constraints through making their group models, (1) shared constraints; constraints used commonly by all the group members, (2) selected constraints; constraints used during the initial modelling and were later reflected upon for use in the group modelling, (3) generated constraints; constraints which were not in the initial modelling but were used later in the group modelling.

The result of the study showed firstly that the group model very much reflected sources of constraints during the field trip. Secondly, the understanding of co-construction of scientific modelling in geological field trip was based on the constraints. This once again confirms the significance of the observation

activities in the geological field trip and reinforces the importance of the teacher's role in the observation activities and during the field trip.

*References:*

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