A Descriptive Study on Students’ Talk During the Presentation of Their Science Projects

Phil Seok Oh
(Ewha Womans University)

ABSTRACT

Based on the Vygotskian perspective that a learner’s thinking is constituted in his or her talk and the assumption that student talk in the classroom may occur in more than one way, this study examined discursive practices of students in Korean high school science classrooms. Data came from 11th grade earth science classrooms where the Group Investigation (GI) method was implemented. Data source included verbatim transcripts developed from video recordings of class sessions in which students presented their science projects to the whole class and exchanged questions and answers during the presentations. The analysis of the videotape transcripts revealed five different modes of student talk, including 1) retrieving information, 2) reformulating information, 3) building on one’s own experience, 4) elaborating current understanding, and 5) negotiating meanings with others. Considering that each of the five modes had different value for learning science, it was recommended that the teacher should engage students in more active modes of discourse and guide them into more sophisticated understanding of science.

Key words: student talk, Vygotskian perspective, Group Investigation, Korean earth science classroom

I. Introduction

Recently, science education researchers have paid much attention to discursive practices in the teaching and learning of science in classrooms (Bianchini, 1997; Herrnkohl et al., 1999; Hogan et al., 2000; Kaartinen & Kumpulainen, 2002; Oh et al., 2003; Scott, 1998; Wallace, 2004). This trend has been influenced by constructivism, which claims that students develop their own knowledge and understanding out of the activities in which they participate. Especially, Vygotsky’s idea that a learner’s thinking is constituted in his or her talk (Vygotsky, 1981, 1987) contributed to the increased recognition of the role of language in learning. Following this line of research, this study examined how Korean high school students used language to talk, as they learned science through the Group Investigation (GI) method. The study dealt in particular with student talk when the learners presented their science projects to the whole class and exchanged questions and answers during the presentations. Although descriptive in nature, this study distinguished different modes of student talk to suggest more valuable ones for better educational practice in science classrooms.

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**Phil Seok Oh (ptvoh@ewha.ac.kr)
II. Background

1. Vygotskian perspectives

The notion of the importance of language in learning is often attributed to Vygotsky’s view on the relationship between thinking and speech. Traditionally language has been regarded as a vehicle for thoughts and feelings. However, for human thinking and learning, language plays a more significant role. "Thought is not expressed but completed in word," Vygotsky contends: "Speech does not merely serve as the expression of developed thought. Thought is restructured as it is transformed into speech" (Vygotsky, 1987, pp. 250–251). Thus, in the Vygotskian framework, thinking cannot be appreciated properly if separated from talking, but rather, a learner’s thinking is constituted in talking. Vygotsky’s explanation of egocentric and inner speech provides an elaboration on this idea. Egocentric speech is talk intended for oneself. It can be heard when an individual plans and regulates his or her actions for resolving some difficulty he or she is now facing. For example:

When the child encountered a problem, he attempted to assess the situation: "Where is the pencil? I need a blue pencil now. Nothing. Instead of that I will color it red and put water on it—that will make it darker and more like blue." The child conducted this entire discourse with himself (Vygotsky, 1987, p. 70).

Thus, the egocentric speech is the child’s attempt to understand the situation and functions as a component of his goal-directed action and thinking. According to Vygotsky, egocentric speech evolves into inner speech in accordance with the learner’s intellectual development. Inner speech is purely internal talk and inaudible to others. But, the structure of inner speech is similar to that of egocentric speech, and inner speech serves the same function as egocentric speech. In other words, inner speech is a unique type of internal collaboration, comprising one’s own cognitive effort for solving problems and making sense of the world (Vygotsky, 1981, 1987; Wertsch, 1980, 1985).

Certainly people speak to themselves through self-addressed talk. It should be noted, however, that egocentric and inner speech are reflections of social processes in which one interacts with others. From the Vygotskian perspective, egocentric and inner speech are proceeded by social speech — i.e., talk with others. Social speech appears first in an interactive setting and provides forms and content that would be internalized into egocentric and inner speech of an individual learner. The internalization process involves constructing new speech, rather than simply copying the external talk, which enables the learner to use the self-directed talk to assist with his or her own cognitive tasks. Thus, the social interactional process offers a foundation for an individual learner to develop dialogues with him or herself, which represents the thinking process per se (Vygotsky, 1981, 1987; Wretch, 1980, 1985).

The Vygotskian perception of the role of language in thinking provides great implications for talk in classrooms. In traditional classrooms, the discursive practices of students were often limited to listening to teacher lectures and to responding to test questions by the teacher (Tobin, 1987; Tobin & Gallagher, 1987). Research has consistently revealed that about 80% of classroom interaction is taken up by teacher-initiated talk. It was also reported that students ask two