
The Eurasia Proceedings of Educational & Social Sciences (EPESS), 2014**Volume 1, Pages 307-310****ICEMST 2014: International Conference on Education in Mathematics, Science & Technology****STUDENTS' TALK DURING COLLABORATIVE GROUP DISCUSSION**Mustafa CANSIZ
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ABSTRACT: This study aimed to explore the types of talk occurring in small group discussions about digestive system. Twenty two seven-graders worked on digestive system in small groups. In order to study these particular group's interactions and how they constructed meaning as they discussed digestion, field notes, transcripts of small-group discussions and group interviews were analyzed qualitatively. The results revealed that three types of talk (exploratory, cumulative and disputational) were observed in each group in varying amounts. The comparative analysis among groups revealed that students' engaged in exploratory talk showed explicit and more sound reasoning than students' engaged in disputational or cumulative talk. The potential factors which may lead to reasoning were also explored.

INTRODUCTION

“Language is, historically and individually, the foundation of being human. And talk—direct exchange between humans who can attribute intentionality and understanding to each other—is the foundational act of language” (Resnick, Michaels, & O'Connor, 2010, p.163). Resnick et al. further stated that “without talk, minds can neither grow nor become disciplined. Without disciplined talk, scientific, mathematical, and humanistic knowledge remains static and unused” (p.163). From ancient times to present, human beings tried to understand the world, communicate with others, shared ideas, emotions, and wishes through language and talk. Dialogue and talk are inevitable in our daily lives as in classroom environments. Structured and disciplined talk can enable learners to improve their reasoning.

Mercer (1996) emphasized that talk between learners is crucial in the construction of knowledge with underlining the idea that not all kinds of talk serve for this aim. Mercer (1996) described the features of talk that contributes to solution of problems and increasing understanding among the students. Mercer stated that it is the talk in which group members present their ideas clearly and explicitly so that they can be understood and evaluated well by all group members. And it is the talk in which group members reason together, share negotiation, evaluates claims and evidences and reach a consensus on the problem. Mercer also identified three conditions required for occurrence of this kind of talk. These conditions are:

- members have to talk to accomplish task.
- activity should support working and accomplishing together rather than encouraging individualized accomplishments.
- all group members should be aware of what the purpose of the task and how they will accomplish it.

Mercer's research works for group work and collaborative activities among learners. Teacher-led whole class discussions and group interaction among learners are two main contexts in which talk and language are related to the learning in schools (Mercer, Dawes, Wegerif, & Sams, 2004). Mercer et al. (2004) stated that learning in groups provides learners with many opportunities to develop different kinds of reasoning patterns (Mercer et al., 2004). In group activities or collaborative activities, learners can display a variety of ways to describe, explain, make connections, draw conclusions, and find solutions. They can be richer in terms of higher cognitive level interactions providing sustained and active engagement in learning (Galton, Hargreaves, & Pell, 2009) but it should be noted that group interactions may not always develop learning and reasoning if the conditions mentioned above are not satisfied. Learners can be off-task easily, uncooperative, and disruptive (Galton & Williamson, 1992).

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- Selection and peer-review under responsibility of the Organizing Committee of the conference

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Three ways of talking during collaborative group activities were identified as exploratory talk, disputational talk, and cumulative talk (Mercer, 1996). Exploratory talk is defined as a joint, co-ordinated form of co-reasoning, in which speakers share relevant knowledge, challenge ideas, evaluate evidence, consider options, and try to reach agreement in an equitable manner. By incorporating both constructive conflict and the open sharing of ideas, exploratory talk constitutes the pursuit of rational decision-making through dialogue. It depends not only upon the establishment of trust amongst partners, but also on the kind of intersubjectivity that enables them to achieve a shared understanding of the task in hand (Mercer, 2008, p. 95).

Disputational talk is portrayed by disagreement and individual decision making rather than sharing ideas, discussing alternatives and making decision as a group (Mercer, 1996). Mercer identified cumulative talk as building each others' ideas uncritically resulting in the accumulation of common knowledge without challenging and discussing ideas. Repetitions, explanations, confirmations are typical characteristics of cumulative talk. Exploratory talk is the talk in which "knowledge is made publicly accountable and reasoning is more visible in the talk" when compared to the others (Mercer, 1996, p. 369). Three kinds of talk can be observed in classroom environment but the research implies that exploratory talk is the rarest but the most important one for cognitive interactions.

In light of previous research, this study aimed to explore the types of talk occurring in small group discussions about digestive system. It also explored how talk may lead to more sophisticated reasoning.

THEORETICAL FRAMEWORK

This study was based on sociocultural theory. Mercer, Wegerif, and Dawes (1999) stated three functions of language in intellectual development according to the sociocultural theory. These are language as "cognitive tool" which students use in order to process knowledge; language as "social or cultural tool" which students use to share knowledge with peers; language as "pedagogical tool" which is used to support students' cognition. Language can function as social and cultural tool among students in the collaborative group activities guided by teachers who use language as pedagogical tool. As a result students' understanding and reasoning can develop through the use of language in a social environment.

METHOD

This study included twenty two seven-graders (four groups consisting of 5-6 students) worked on digestive system, specifically on the task "what happens to the food we eat". Students were required to negotiate how different kinds of food (bread, steak, butter) are processed through digestive system. Before activity, they were told some directions. They were required to ask questions and elaborate on others' responses. The questions should be to learn about student's ideas and underlying reasoning. Students were given such directions to make group work productive to improve learning and reasoning. In order to study these particular group's interactions and how they constructed meaning as they discussed digestion, field notes, transcripts of small-group discussions were analyzed qualitatively by two independent researchers. Interviews were conducted to understand group interactions and to explore more about their reasoning as a result of collaborative work. The analysis was based on the framework developed by Mercer (1996) to evaluate talk among students. For each group discussion, episodes of different talks were identified by two independent researchers and consistency between them was ensured.

RESULTS

The analysis of group discussions revealed that the four groups displayed all kinds of talk in varying amounts. However one group was engaged in exploratory talk more during their discussions. The other three groups were mostly involved in disputational and cumulative talk. The relative percentages of talk each group displayed were given in Figure 1

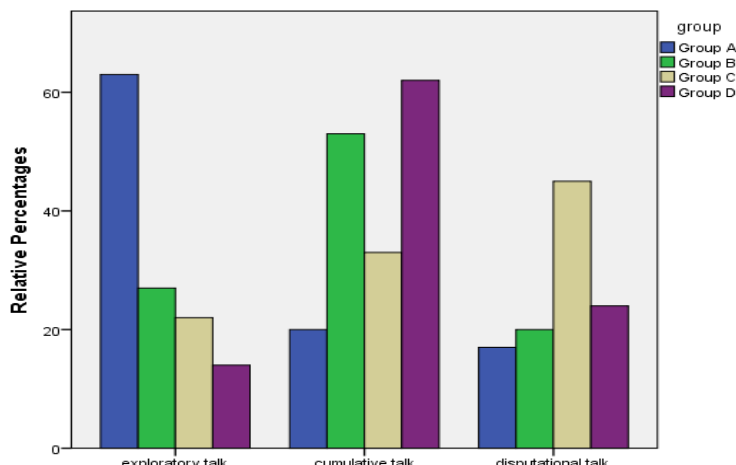


Figure 1. Comparison of Percentages of Talk Observed in each Group.

The Figure 1 reveals that Group A displayed exploratory talk considerably more than other groups (63%). Cumulative talk was mostly observed in Group B and D. More than half of discussions in Group B and D were characterized as cumulative talk. Disputational talk took place in similar percent in Group A, B, and D (around 20%). On the other hand, Group C displayed disputational talk frequently (45%). Group C is the one which was engaged in disputational talk most.

The comparative analysis among groups revealed that students engaged in exploratory talk showed explicit and more sound reasoning than students engaged in disputational or cumulative talk. The group interviews also supported that students engaged in exploratory talk displayed higher level of reasoning than other types of talk. Table 1 presents an example exploratory talk displayed in Group A.

Table 1. An Example Exploratory Talk Observed in Group A

Student A. Let's discuss the first one, bread. What do you think about digestion of bread?
Student B. It is digested as all foods.
Student A. But how? We should discuss this.
Student B. Ok. When we chew it, it becomes smaller.
Student C. I agree.
Student A. But being smaller means digestion?
Student C. Yes. But it is not the whole. There are some other processes.
Student B. What kind?
Student C. It goes to small intestine and is still digested there.
Student D. I have a question. Do you think it becomes even smaller in small intestine?
Student C. Umm!... should be so... I am not sure.
Student A. (Referring to student E) what do you think about it?
Student E. I think teeth help bread become smaller and saliva makes it softer but the real digestion starts in small intestine. Do you agree?
Student A. No. Saliva does not only make softer, it also includes some enzymes that start digestion of bread.
Student E. Ok. You mean that digestion starts in the mouth?
Student A. Yes but not all foods. It depends on the kind of food.
Student D. Does this mean different food requires different enzymes?
Student A. Sure, and in different digestive organs.
...

In the example above, five students focused on digestion of food. Student A started the discussion and encouraged others to present their ideas. These students not only presented their ideas but also elaborated on them. They asked questions to each other and clarified the ambiguities in the answers. This discussion helped students reason on concepts related to digestion. Student A mostly acted as a guide and helped others discuss

about the topic. It was evident that this student was more knowledgeable about digestion and used his prior knowledge in the discussion.

DISCUSSION

The results revealed that three types of talk were observed in each group with different amount. The qualitative investigation of each group's discussion revealed that the group that exhibited exploratory talk showed in depth reasoning than other groups did. The students in this group asked questions which fostered further interpretation. The collaboration among them also helped the comprehension of the topic by relatively passive students. Talk, as an activity, provided opportunities for students to construct knowledge and develop reasoning with the aid of interaction with others. For group works and other collaborative activities in the classroom, talk has a potential role in contributing to the learning. Mercer (2008) stated that exploratory talk increases reasoning skills through interaction among group members who become more sophisticated users of language as a psychological tool. There are also other studies having similar findings which reveal that peer talking and discourse in the groups result in higher levels of reasoning through discussing and elaborating each others' ideas (Hogan, 2002; Mercer et al., 1999; Resnick et al., 2010). The results showed that students' knowledge about digestive system also influences the interaction and talk among them. The knowledgeable student in this group (Student A) guided the discussion and scaffolded others. This result is consistent with Vygotsky's (1978) claim that discourse and interaction among students can shape their individual mental processes. Dawes (2004) also emphasized that group talk can help learners to exchange ideas, to have access to different perspectives and to make meaning together.

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