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Research Artikel

**CLASSROOM INTERACTION: TEACHER AND STUDENTS PERCEPTION ON
DIALOGUE IN PRIMARY SCIENCE CLASSR**

***INTERAKSI DALAM RUANG KELAS : PERSEPSI GURU DAN SISWA MENGENAI DIALOG
DALAM PEMBELAJARAN SAINS DI SEKOLAH DASAROOM***

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Abstract

This study aims to explore the teachers and students' perspective on classroom dialogue and its purpose in primary science classrooms that implement the new integrated curriculum in Indonesia. Research on the process of teaching and learning through classroom talks has been carried out over the last forty or so years. In the field of science education, classroom talks have become a central issue in developed countries within last twenty years. Although research focused in this topic is growing rapidly in Western countries, this is not the case in Indonesia. Few studies have dealt with classroom talk in Indonesia. We gathered our data during a period of four months by video recording, targeting lessons of classroom discussions in two primary schools in the Greater Jakarta area in Indonesia. To support data generated from classroom observation, I interviewed teachers and a sample of students in each class. Data were analysed using sociocultural discourse analysis. This study suggests that providing a room for students to interact and share with each other has changed the approach of learning science in the classroom. Classroom talk both in small groups and involving the whole class altered to pedagogical dynamics from a teacher centered approach to student centered one. The study also reveals that classroom talks did not only encourage students to develop their zone proximal development but also help them to learn the values of democracy.

Keywords: classroom interaction. classroom dialogue, primary science, sociocultural perspective.

Abstrak

Penelitian ini bertujuan untuk mengeksplorasi persepsi dari guru dan siswa sekolah dasar terkait dengan interaksi dan dialog yang terjadi dalam pembelajaran sains di kelas mereka. Penelitian terkait interaksi dan dialog dalam proses belajar mengajar sudah berlangsung selama empat puluh tahun lebih. Dalam bidang pendidikan sains, topik ini baru menjadi salah satu isu sentral penelitian dalam dua puluh tahun terakhir, khususnya di negara maju. Sayangnya di Indonesia, kajian ini belum banyak diteliti. Literatur dan kajian terkait dialog dalam pembelajaran sains baik di sekolah dasar maupun sekolah menengah masih sangat terbatas sekali. Data dalam penelitian ini dikumpulkan dalam kurun waktu empat bulan di salah satu sekolah di wilayah selatan Jabodetabek.. Peneliti melakukan interview dengan guru dan siswa berdasarkan gambar dan video pembelajaran kelas mereka. Data kemudian dianalisa dengan menggunakan diskursus analisis sosio kultural. Dari hasil penelitian terlihat bahwa memberikan kesempatan untuk berinteraksi didalam kelas telah mengubah pendekatan dan dinamika dalam pembelajaran sains. Penelitian ini juga menunjukkan bagaimana interaksi dan dialog dalam pembelajaran sains tidak hanya membantu mengembangkan kemampuan siswa dalam wilayah zone proximal development mereka, akan tetapi juga mendukung siswa dalam belajar nilai kehidupan termasuk nilai-nilai demokrasi.

Kata Kunci: interaksi dalam kelas, dialog dalam kelas, pendidikan sains, sosio kultural.

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INTRODUCTION

The classroom is an environment in which talk is facilitated, whether between teachers and students, or among students themselves. Such discussion plays a major role in the teaching-learning process. Educational researchers have paid serious attention to the topic of classroom talk and studies have been conducted over the last 40 years. In the field of science education, classroom talk has become a central issue in developed countries over the last 20 years. However, this is not the case for Indonesia, where there is very little published research on classroom talk in science education. To contribute to the development of science education in Indonesia I conducted this research. This study aims to explore the pattern of interaction of talk between students in primary science classrooms that implement the new integrated curriculum in Indonesia. In order to achieve this purpose, I am addressing the following research questions (RQ) “what are teacher and students’ perception on the interaction of talk in the primary science lesson?”

This study carried out using the lens of sociocultural theory. The first significant aspect of Vygotsky’s sociocultural perspective emphasises the important role of social interaction for constructing knowledge. Vygotsky proposed that children’s interactions with adults and peers will help them internalise knowledge and develop their way of thinking. He stated: “*Every function in the child’s cultural development appears twice: first on the social level, and later on the individual level: first between people (interpsychological) and then inside the child (intrapsychological)*” (Vygotsky 1978, p.57)

The process of interaction is not merely a social process; rather, it is a process embedded in culture, and one that affects the way individuals think and feel. Accordingly, Mercer and Littleton (2007) suggested that a sociocultural theory applied in the classroom must take into account the relationship between three levels of human activity: the cultural level, the psychological level and social level. The social level activity is the standard of activity that shows the interaction between groups and between individuals. This is the level of talk and dialogue in the classroom. Mercer and Littleton (2007) claimed that through speech students will

have the capability to encounter the culture of their community and society embodied in the language, so they will be able to discover the way people make sense of experiences. At this level of activity, students engage in the action people usually pursue through talk, such as sharing information, instructing, arguing, narrating, eliciting information, demonstrating understanding and evaluating knowledge.

Referring to the interaction at the social level, one focus of the study is to understand the activities which occur during classroom interaction, the interaction between teachers and students, as well as between students. The interaction between teachers and students usually shows an asymmetrical position in which teachers have more knowledge and more role than the students. According to Vygotsky’s perspective, the teacher as the individual with more experience will demonstrate his/her pivotal role in mediating and passing knowledge. Relating to this teacher’s role, Bruner (1985) concluded that in following the Vygotskian principle, students learn from their tutors how to understand the world. He further noted: “*There is no way, none in which a human being could master that world without the aid and assistance of others*” (Bruner 1985, p.32). Then, to assist the students, Howe (1996) described how the teacher guides, directs and encourages activities in the social plane to support the learning process.

Furthermore, teachers make different interventions to support their students in learning through social interaction. In the field of science education, several scholars proposed the form of pedagogical intervention during an interaction at the social plane, for example, Edward and Mercer (1987), Mercer (1995) and Scott (1998), who became the reference point for this study. Edward and Mercer (1987), in their book *Common Knowledge*, and Mercer, (1995) in his book *The Guided Construction of Knowledge*, presented the pedagogical intervention based on detailed analysis of classroom talk in various subjects, including science. In line with these publications, Scott (1998) developed a framework of five forms of intervention which he called “teaching narrative”. This framework was conceptualised based on empirical studies and directed towards making

scientific knowledge available on the social and individual plane.

After the activities in the social plane, the learning process will occur at the individual level. Students will attempt to internalise the ideas emerging during interactions in the social plane. In relation to classroom talk, students will internalise what they heard in talk, so they will be able to use the knowledge they obtain from the internalisation process. As Vygotsky (1991) stated, "All that is internal in the higher mental functions was at one time external" (Vygotsky 1991: 36, as cited in Wegerif, 2005). In other words, students' skills emerge through the mastery and internalisation of process in the social plane (Wertsch and Tulviste, 1992).

Furthermore, the internalisation process is not simply a knowledge transfer process from social to individual planes (Chin, 2006). What happens in the single plane is a comprehensive process that involves thinking and dialogic process on the intramental plane (Leach and Scott, 2003; Rooth, in press), which relates to what Vygotsky called the process of inner speech or speech-to-oneself. We should keep in mind that every student has different abilities to think and to reflect. Consequently, the process of inner speech between students will vary, and thus the results of the internalisation will indeed differ between students (Jones, 2009).

METHODOLOGY

Over the last three decades, various approaches have emerged within the qualitative research paradigm, such as ethnography, grounded theory, case study, phenomenology, and historical research (Creswell 2009). Given the fact that the present study aims to explore in-depth the talk in primary science classrooms in Indonesia implementing the new curriculum (Curriculum 2013), a case study is a suitable approach for this study.

My research was carried out in year four at two primary schools in Greater Jakarta, Indonesia. Video recording of ten science lessons were made in each classroom. Two teachers, Mr Dono and Mrs Diana, agreed to participate voluntarily in this

study. The lesson topics were selected through discussion with each teacher, which based on the guidance of the Curriculum 2013. As researchers, I made no intervention on lesson plan, classroom instruction and assessments. However, I shared the focus of the study with the teachers to make it clear the objective of our research. This paper draws only the data gathered from interviews with Mrs Diana classroom. To be objective in this study, we maintained a clear relationship between researcher and participant. Data gathered were analyse using thematic analysis to look teacher and students' perception on classroom interaction

FINDINGS AND DISCUSSION

Teacher Perception Classroom Interaction

Having experience teaching primary students on four different curriculums, Mrs. Diana noted that the new curriculum provides space for students to explore science more than the previous curricula. Students are given sufficient time to enjoy the process of exploration and to discover the science concepts. She also described the link between understanding rather than just memorising, and linked acting and knowing. She mentioned during an interview:

There are more experiments in the new curriculum. In the past, we taught all the theory and sometimes asked students to answer the questions directly. Because the previous curriculum was dense, many materials had to be memorized. It is more likely a doctrine in the past, but now there are experiments in the new curriculum. What I have noticed from themes 1, 2, 3 and 4 is that students do science and understand science from the experiment, and do not merely memorize it. For example, on the topic of mirrors, the material is quite a lot, but since students conduct the experiment they know the different types and their uses. In the past, we dictated that mirrors are this or that. (Interview 1 with Mrs. Diana)

In addition, Mrs. Diana found that the new curriculum promotes students' discussion:

The new curriculum encourages pupils to talk. Students who are not able to talk

should be given a chance to deliver their opinion. (Interview 1 with Mrs. Diana)

Now all children are involved in group discussion. In the past, only a few students actively engaged in discussion. (Interview 1 with Mrs. Diana)

So, during the experiment students have a discussion, they have interaction, sharing opinions. I tell them if they find something to tell their friends why this happens. It is interesting to see students talking to one another. (Interview 1 with Mrs. Diana)

Teachers play a certain role in promoting talk during group work and experiments. Teachers walk around the class during group discussion and encourage students to talk (field notes 7/3/2014). In particular, Mrs. Diana mentioned:

As a teacher, I walk around the class during group discussion. I encourage and motivate student to talk when finding a silent student, “why you do not talk?” “please share your idea”. (interview 1 with Mrs. Diana)

Now, with the implementation of the new curriculum, we should be able to make all students active in class. We should ask students, so they will talk, “Why? How?” We encourage students by asking probing questions, so they will respond: “Pick me Miss... Me Miss,” as you observed yesterday.” (Interview 1 with Mrs. Diana)

Moreover, to follow the curriculum, Mrs. Diana organises group work during science lessons. She employs different strategies in grouping her students. The two most common strategies she uses are to create mixed capacity groups and groups based on the students’ seat (rows of students turn their desks to face one another). Mrs. Diana notes that creating mixed ability groups is an effective way to ensure dialogue occurs (Interview 2).

We had students ranked in the past, and I think teacher still needs the rank to know students’ ability and skills. When we create the group, we choose students who are able to lead the group at first... If we create 5 groups, we choose five first top students to be distributed in each group, followed by five second top students, and so forth. So the groups are similar, there will be strong and

weak students in each group. (Interview 2 with Mrs. Diana)

When grouping the students based on seating, it sometimes happens that the members are homogenous. For example, less active and low-attaining students gather in one group. This group may not perform as well as the group of high attainers, but they will try their best and show that they also have the capacity to finish the task. She was even surprised to see how weak students discuss and take different roles in their group work;

Lately, when they enter the classroom the children are free to sit anywhere, and in group work the rows of students turn their desks to face one another. In this way, the students are trained to socialize with classmates. So, when I ask students to work in groups based on their seat, students automatically turn their desks. Sometime, low achieving students would meet with the low achieving students, and surprisingly they can do it. I was questioning it: “The members of this group are low achievers: Can one lead the group? Are they able to do a task?” Yes, they could. They can lead their group in their capacity, they are able to speak and deliver their opinions. It is good progress. (Interview 2 with Mrs. Diana)

She revealed that, as adults, teachers sometimes underestimate the abilities of their pupils. We may consider that primary school students are young, lacking knowledge and thought. However, as she mentioned during the interview, students show their capacity beyond adult expectations:

Once students did not agree with their friends, they argued: “I think it is supposed to be like this and that”. I am amazed that my students have the ability to argue. I was thinking that my students were just able to report their discussion. (Interview 2 with Mrs. Diana)

Moreover, Mrs. Diana recognised the importance of dialogue and classroom discussions for students’ developments:

There will be a sharing of knowledge when pupils discuss with their peers. If one does not know or does not understand, others

will give advice and share their understanding. (Interview 2 with Mrs. Diana)

Over time, you see in the class that there is progress, when for the first time you observe that David is able to argue. Lately, most of the students are able to argue, and are able to speak. Even pupils who are in the very bottom rank, such as John and Nina, are able to deliver and to present their ideas. So, in the end almost every pupil is able to speak. However, some smart students do not want to talk, three or four students. Perhaps they just don't like to talk. (Interview 2 with Mrs. Diana)

Sometimes students do not want to speak voluntarily; they point to others: "Why don't you? Why don't you [talk]?" It is because they are not confident. But, I always tell my students to give a chance to someone who has not talked. So in the end they could. (Interview2 with Mrs. Diana)

As seen clearly in the extract above, the teacher was able to observe the progress of students and investigate particular those who enjoy speaking, arguing and presenting their ideas. Furthermore, she noted some of the benefits of classroom talk for her students, including providing a sharing moment to develop attitude and knowledge. She mentioned that most students progressed well through discussion, even those who ranked lowest in the previous year. She further stated that working in groups and holding discussions helps students to develop their confidence.

However, Mrs. Diana also recognised some challenges faced by all parties when promoting discussion. Due to the students' personal characters, she noticed that some students did not want to talk, even though they are smart and capable. In addition, due to time limitations and the fact that quite a lot of school holidays fall during the second semester, she was unable to encourage all the experiments and discussion.

Students' perceptions of dialogue in science lessons

In accordance with Mrs. Diana's description in the previous section, all the pupils expressed similar views that the new curriculum provides

room for science activities and discussion. The following comments highlight this issue:

- Daniel : (The new curriculum) offers many activities
 Melissa : We can speak and give opinions.
 Dessy : Develops students' skills. Skills in creating something and skills in speaking.
 (Interview#1 with the students)

What the students convey is likely based on their learning experience using the previous curricula. This certainly supports Mrs. Diana's explanation that the previous curricula were dense and provided less room for science activities, whereas the present curriculum encourages teachers to provide opportunities for students to learn science through science activities, collaborative learning and group discussions. Correspondingly, when students were asked the approach they preferred when learning science, two students pointed to a picture of pupils conducting experiments and two others pointed to the image of group discussion. They are happy to do the experiment and discussion because they can work together, while simultaneously sharing their ideas and opinions, as indicated in the following comments:

- Melissa : Because we do activities and group works
 David : Because we have an opportunity to share our ideas.
 Melissa : So pupils have time to speak.
 (Interview #1 with students)

Furthermore, based on classroom observations, the science experiments and discussion in Mrs. Diana classroom were conducted in groups. Mrs. Diana used several strategies to group students. Sometimes she grouped students based on a list of students, at other times she mixed active students with non-active students, and sometimes students turned their tables. As presented by the students:

- Melissa : (Grouping) based on the list of attendees.
 Dessy : Based on obedient and disobedient pupils.
 David : Active students mix with non-active students. If all the group members are inactive, the teacher will add one

active student to the group.
(Interview #1 with students)

It is interesting to note that Dessy raised the issue of the teacher categorising students based on their obedience. When I asked about this issue, Dessy could not further explanation. In support, David said that sometimes Mrs. Diana would form groups based on a combination of active and inactive students. This opinion is in line with the teacher's description in the previous section. They believed that the dialogue would take place by combining active with inactive students. Active students are expected to initiate dialogue and encourage their friends to talk, as David explained, "So all the group members will be active".

The students also concurred that sometimes their friends were reluctant to participate actively in the discussion. If they had group members who did not want to talk, they usually encouraged their friends to speak and participate, as the following comments highlight:

David : Ask their opinion. Ask them to read a book and then ask them to speak.
Daniel : Invite them to express their opinion.
Melissa : Encourage them to change.
For example, please share your opinion, so we do not make a mistake again and again.

(Interview #1 with students)

The students also agreed that they needed a supportive classroom atmosphere in which to facilitate group and classroom discussion. They needed all the group members to be calm and serious during the discussion. However, they did not deny that they had non-curriculum talk, for example, about games or movies (interview 2), on completion of the task or when they feel bored. The following comments highlight some of their experience:

Melissa : If some friends fight and make noise we cannot learn.
Daniel : I like this blob (point out the blob), because it looks serious but also makes a joke. When we learn, we need to be serious but also make joke sometimes, so it will not be boring.

(Interview #2 with students)

Moreover, in relation to shared opinions, ideas and knowledge, students mentioned that the ideas come from a variety of sources. They are obtained not only from textbooks, but also from their daily experiences, for example, previous lessons, books and magazines, and knowledge shared online:

Melissa : Read a book.
Dessy : Read a book and remember previous lesson.
Daniel : Read a book and sometimes the idea just comes.
David : Sometimes I hear from my parents.
Dessy : Internet.
David : Yes, internet.

(Interview#1 with students)

In addition, students suggested that they sometimes have different opinions in group discussions, perhaps because of the diversity of their perspectives and existing knowledge. In dealing with this situation, students usually vote or choose what they think is right. As they put it:

Daniel : Looking for the most correct answer.
David : Yes, look for the most correct.
Melissa : Ask others for their preferred answer.

(Interview #1 with students)

Furthermore, after group discussion, Mrs. Diana usually invited students to participate in a general class discussion. It is intended that each group shares the outcomes of their discussions. When students presented the results of their conversations, they sometimes received objections from their peers. It happened when the results presented were considered wrong or the language used was not appropriate. When their friends argued, students learned to listen, to appreciate and respect their peers. Students highlighted this point by stating:

Dessy : Listen and respects others' opinions.
Others : Yes, listen and respect others.

(Interview #1 with students)

In relation to the experience gained from group and classroom discussion, the students expressed similar views that dialogue yields many benefits. The following comments highlight the advantages of dialogue:

Dessy : Know more about things.
Dessy : Learn to respect other ideas.

Melissa : Inactive students have a chance to speak.

Daniel : Improve our confidence.

David : So that we will be smarter.

(Interview #1 with students)

David : We get more knowledge.

Daniel : We know more and we can improve our speaking skills.

Dessy : We can learn to express our opinion.

(Interview #2 with students)

Dialogue provides not only an opportunity to talk and communicate an opinion, but also helps students who are reluctant to participate become more active contributors. Dialogue can build confidence and develop mutual respect in terms of allowing others to speak and have what they say listened to.

CONCLUSION

The findings of this study, show that both students and teachers expressed similar views that the new curriculum provides room for science activities and discussion. They believe that talk is a tool in learning science. Students were happy to do the experiments and partake in discussions because they simultaneously were able to work together and had an opportunity to share their ideas and opinions. To promote talk in science lessons Mrs. Diana organized their students to work in groups. Teacher created mixed ability groups to ensure that discussions took place within the group. They also revealed that classroom talk has many benefits, as discussed in the previous section.

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