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Other Topics

Teaching as Conversation

By using conversation to "construct" meaning about topics of study, teachers can figure out students' thinking and adapt instruction to their needs.

Constructive classrooms (Arlin in preparation) are classrooms "where teachers and students negotiates as they attempt to construct shared meanings" (Cobb 1986). These negotiation can be described as "conversations." In constructive classrooms, the emphasis is on the quality of the interaction between teacher and student as they attempt to build their knowledge of their world.

The constructive view of teaching invites teachers and researchers to reflect on the relationship between teacher and student and on their conversations. These conversations are an extension of Piaget's description of his "method" in probing the development of logical thinking in children. When asked by an interviewer (Bringuier 1980) how he developed his protocols, Piaget responded that he conducted "a series of informal conversations with the children on the optics we've chosen; from them we derive protocols that are the written results of the conversations."

Not satisfied with this response, the interviewer probed further: "How can you tell when it is finished?"

Piaget responded: "I have only one criterion. I consider an investigation finished when we no longer find out anything new, that's all" (Bringuier 1980).

Insight into Students' Thinking

Teaching as conversation is an exploration between child and teacher as they actively engage in finding out about a topic of their own choosing. The curriculum can be conceived as the basis for topic selection wherein specific objectives can be met and where *understanding* is the goal. This type of teaching reflects the concern of Piagetians, who are more interested in "how a child has a concept" (Larsen 1977) than in the child's ability to retell to the teacher the definition that the teacher or the textbook first told the child (Bransford et al. 1987). As children let teachers in on their thinking, teachers gain insight into how to adapt instruction to their needs (Arlin 1985 and 1987, Elkind 1976).

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The two conversations that follow illustrate the types of negotiation required by both teacher and students as they construct shared meanings.

Conversation 1: Energy Transfer

The students in a 5th grade (Arlin 1987a) had just completed a series of explorations and a guided science experiment with two metal spheres, a ramp, and a slide that moved when hit by one or both of the spheres. The children had recorded the distances that the slider moved for each of five different arrangements of the spheres on the ramp. Their conversation focused on an arrangment of the smaller sphere placed directly in front of the larger sphere at the top of the ramp. Both were released together. The larger sphere transferred energy to the smaller sphere as they hit the slider.

Nine groups experimented with the spheres and measured the distance the slider traveled from the point of impact. The distances ranged from 770

to 980 millimeters with a student-computed average of 926 millimeters. Though the students were able to compute the average, the teacher wondered just "how they had the concept" of average.

Teacher: What is average anyway?

Student 1: Like an average distance?

Student 2: Most of them will go a certain distance, and here's a number in between there that's the distance they usually go.

Teacher: That's an interesting idea. And what do you think an average is?

Student 3: An average is when you added up all these numbers and divided the final answer by how many times, and then that answer becomes your answer.

Teacher: What does it tell you after you have done that?

Student 4: You are trying to combine them to get what's the most common answer, like right in the middle of it.

Student 5: Getting close to it.

Student 6: If you are close to it, then you are mostly accurate.

Teacher: How can you tell when you are mostly accurate? What group were you in? . . . so group two got 870 for their value, and the average is 926 millimeters. So how does that tell you how close you are?

Student 6: Oh, we were not really accurate.

Teacher: How do you know what an accurate one really is?

Student 7: By comparing with the other groups and seeing what they got and the average of all the numbers. You add up all the numbers, and you divide by 9.

Student 8: Like group two is really accurate.

Teacher: Why is that?

Student 8: Because it is really close to it.

Student 9: Yes, they are really the closest because 936 is really over it. I think that 870 is closest to the average because 936 is over it . . .

Student 10: That doesn't matter.

Student 9: Yes it does. (Support for both responses is heard.)

Teacher: We seem to have a difference of opinion here. Some think that your accuracy is how close you are to the average distance without going over it, and others think that your accuracy is how close you are to the average not matter whether you are above or below it. How can we go about finding out which it is? . . .

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In many classrooms the third student's response ("An average is when you added up all those numbers and divided the final answer by how many times, and then that answer becomes your answer") would have been acknowledged as correct, and the teacher would have rephrased the student's response in more formal language and continued with the lesson. In our example, however, the teacher continued the conversation and probed how the students had the concept of *average*. She then picked upon the sixth student's concept of *accurate* and asked the student to think about what *accurate* might mean in relation to *average*. The seventh student seemed to give back "how to compute" an average but also showed a beginning understanding of how to use an average.

Each student's comments gave the teacher insight into his or her thinking, and together teacher and students gradually constructed the concept of average. By probing "how the students had the concept," the teacher could readily see their misconceptions. That is, some of the students were able to compute an average but had little conceptual understanding of an *average*. Rather than simply correcting the students' misconceptions, she valued both competing hypotheses and invited the students to develop a thought experiment through which they could test their ideas. In the constructive classroom children are given time to create and to coordinate relationships and, in the process, to develop more powerful concepts.

Conversation 2: The Government of Sparta and Athens

A 6th grade class engaged in a study of Ancient Greece and Rome as part of a state-mandated social studies curriculum. Having completed a discussion of Athens, they were now beginning to learn about Sparta as a study of contrasts.

Teacher: We are talking around and about this word *government*. I am curious about what government is?

Student 1: Well, like the way city-states rule their territories.

Student 2: Like everybody, made of people who have different jobs.

Student 3: Government like makes rules for city-states.

Teacher: Do we have a government in the United States? Does ithave anything to do with making rules? ("No's" and "yeses" can be heard throughout the room.) Oh, this is interesting. There is a difference of opinion here. Some people said yes, and some people said no. I am curious about this. How many will say "Yes, governments make rules," and how many will say "No, they have nothing to do with them"?

Student 4: But you didn't say "make them." You said "have something to do with them."

Student 5: The government made rules for the city-state.

Teacher: But I said to you, "Do we have a government that makes rules?"

Student 4: Our government doesn't *make* laws, but it *passes* laws.

Student 6: Every government has something to do with law because you vote on the people . . . and you know what they are going to do, and so in an indirect way you know what laws they are going to pass.

Teacher: One of the differences I am hearing is that there is a difference between making laws and passing laws. Is that what I am hearing?

Student 7: There are people who make laws, and there are people that pass laws.

Student 8: Congress passes the laws.

Teacher: But where does Congress get the laws in the first place?

Student 8: From the people.

Teacher: How recently did you make up a law and take it down to your friendly

congressperson and say, "Here, now go and make this a law"?

Student 9: They approve of it.

Student 10: No, but we don't make them.

Student 8: Congress passes the laws.

Teacher: But then where is that law starting?

Student 9: A complaint.

Teacher: How does it start from a complaint?

Student 9: Someone like . . . I don't know.

Student 8: The Congress of the United States represents the people.

Teacher: I am curious about this. We were talking about government in Sparta and Athens, and we then tried to make a comparison between their governments and ours. We are also trying to figure out whether or not making the law or passing the law is the same thing. We had quite a variety of opinion on that.

Student 9: I think it is different because if it starts with someone complaining about something they don't think is right, and then they can get several people to agree with them, then they can take it up to Washington . . .

And so the conversation continued shedding light on the extent to which the students had or did not have an adequate concept of government. Throughout the conversation, the teacher and the students negotiated the meaning of *government*. Such a negotiation was necessary because the objectives of the unit rested on the students' ability to compare and contrast the forms of government in Sparta and Athens with the form of government in the United States. To be able to do so presupposes that the students have adequately constructed a concept of their own government. The conversation provided the teacher and the students with the opportunity to test that assumption.

From the Student's Point of View

Conversations such as the two presented here lead, as Kamii suggests (1984), to "both intellectual autonomy and to better comprehension of content, because children can actively relate ideas and simultaneously evaluate their classmates' various perspectives." The constructive classroom draws upon a rich theoretical framework that uses conversation as one means of looking at curriculum and instruction from the student's point of view. Conversations provide the teacher with strategies for assessing "how" students have concepts and for negotiating shared meanings in their mutual knowledge construction.□

Author's note: I wish to thank Superintendent Don Moore, Curriculum Director Phyllis Constan and the teachers and students of the Winnetka, Illinois, Public Schools for the many insights they provided in the development of the two conversations reported here.

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