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ABSTRACT

Prepared as part of a series applying recent research in oral and written communication instruction to classroom practice, this booklet examines the language interaction that takes place between student and teacher and between student and student whenever a geniune dialogue about an important event or problem occurs. The first section of the booklet examines the connection between dialogue and thinking and looks at classroom dialogue as: (1) a means of allowing teachers to find out if students know right answers, and (2) a conversational partnership. The section also discusses written conversations as a way of thinking. The second section explores in detail how dialogue works, describes the concept of interactional scaffolding, and reviews the conditions for dialogue. The third section explores whether dialogue and social interaction help students to think differently, and the fourth suggests ways teachers can engage students in more thinking together. The booklet contains a number of examples of student work. (FL)

Thinking Together: Language Interaction in Children's Reasoning

By Jana Staton

The Talking and Writing Series, K-12: Successful Classroom Practices

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The purpose of this series is to provide information to assist teachers and curriculum planners at all grade levels in improving communication skills across the major disciplines.

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PREFACE

During the past decade, teachers, education administrators and researchers, and the general public have become increasingly concerned about students' ability to communicate. This broad public concern for improvement in education led to the enactment of Title II, Basic Skills Improvement Act, Public Law 95-561. The Basic Skills legislation encourages Federal, State, and local education agencies to utilize " . . . all available resources for elementary and secondary education to improve instruction so that all children are able to master the basic skills of reading, mathematics, and effective communication, both written and oral." Section 209 of the act specifically authorizes the Secretary of Education to collect and analyze information about the results of activities carried out under Title II. Thus, improved instruction in the basic communication skills—speaking, listening, and writing—has become the focus of programs and research projects throughout the country.

The booklets in this series, *The Talking and Writing Series, K-12: Successful Classroom Practices*, provide information to assist teachers and curriculum planners at all grade levels to improve communication skills across all major disciplines. Developed under a contract with the U.S. Department of Education, the 12 booklets apply recent research in oral and written communication instruction to classroom practice. They contain descriptions of teaching practices; summaries and analyses of pertinent theories and research findings; practical suggestions for teachers; and lists of references and resources. Also included is a booklet on inservice training which suggests how the series can be used in professional development programs.

The booklets were developed through the efforts of an Editorial Advisory Committee comprised of 14 professionals in both the academic and research areas of written and oral communication education. The group worked with the sponsoring agency, the Department of Education's Basic Skills Improvement Program, and Dingle Associates, Inc., a professional services firm.

The committee members, in consultation with the Department of Education staff, chose issues and developed topics. Ten of the 14 committee members authored papers. The committee reviewed the papers and provided additional expertise in preparing the final booklets, which were edited and designed by Dingle Associates.

We are grateful to the committee members, advisors, and all others who contributed their expertise to the project. The committee members were:

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It is hoped that the booklets in this series will be valuable to classroom and administrative professionals in developing or restructuring their communication skills programs. They may also be useful to community and parent groups in their dialogue with members of the educational system. The ultimate benefit of this project, however, will be realized in our children's enhanced ability to communicate, both orally and in written language.

Sherwood R. Simons
Project Officer

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THINKING TOGETHER: LANGUAGE INTERACTION IN CHILDREN'S REASONING

By

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Permission to reprint the following material is gratefully acknowledged:

- The transcripts of the dialogue journals, throughout, from *Analysis of Dialogue Journal Writing as a Communicative Event.* J. Staton, R. Shuy, J. Kreeft, and Mrs. R. Center for Applied Linguistics. Washington, D.C. 1982.

- The transcript of the "Seeds Lesson," from *Language Diversity and Classroom Discourse.* C. Lucas and D. Borders-Simmons. Center for Applied Linguistics. Washington, D.C. 1982.

- The transcript of the "Five Chinese Brothers" story from the *Quarterly Newsletter of the Laboratory of Comparative Human Cognition.* Universtiy of California, San Diego, La Jolla, Calif. 1979.

- The "Pigman" essay and dialogue, from Grant Farley, Wilmington Junior high School, Wilmington, Calif.

INTRODUCTION

The real voyage of discovery consists not in seeing new landscapes, but seeing old landscapes with new eyes.

—Proust

This booklet is intended to help teachers see a very familiar "landscape" with new eyes. That landscape is the language interaction which occurs between teacher and student, and between student and student, whenever a genuine dialogue about an important event or problem occurs. The development of thinking for all children occurs through particular kinds of language interactions in which a child can work through a problem jointly with an adult or peer. These language interactions are so familiar and so hard to "capture" for observation that we may fail to see them for what they are: the most important encounters that a child can have in learning how to think.

Research on classroom teaching has found that in the very act of teaching, the teacher's way of *thinking out loud* (or thinking on paper in written dialogues) becomes a model for students (Green, 1983; McNamee, 1979; Staton, 1982a). For this "model" to be acquired and internalized, however, students must be active conversational partners *with* the teacher in situations in which they are thinking *together* about the same topic or problem.

Jerome Bruner has described this practice very succinctly in *Toward a Theory of Instruction*:

. . . what the teacher must be, to be an effective competence model, is a day-to-day working model with whom to interact. It is not so much that the teacher provides a model to imitate. Rather, it is that the teacher can become a part of the student's internal dialogue—somebody whose respect he wants, someone whose standards he wishes to make his own. It is like becoming a speaker of a language one shares with somebody. The language of that interaction becomes a part of oneself, and the standards of style and clarity that one adopts for that interaction become a part of one's own standards (1966, p. 124).

WHAT IS THE CONNECTION BETWEEN DIALOGUE AND THINKING?

Learning to think is like learning a language: It simply is not enough to learn isolated strategies any more than it is enough to learn a vocabulary list. To be able to think in new situations—which is the real goal of all education—children need a lot of experience in thinking with someone who is good at it. Thinking is invisible until we use language to make it visible.

However, a student, by just passively listening to someone else talk about an unfamiliar problem or topic cannot begin to learn how to think about his or her *own* tasks or problems. Just as we learn a language by talking with someone who is good at it in specific situations concerning tangible, shared experiences, so we learn to think by thinking *with* someone to solve a joint task or problem.

Following are some actual examples of dialogue—language used in interactive situations involving a teacher and one or more students—that serve to define the meaning of interactive mental processing or "thinking together."

Two views of classroom dialogue

Some researchers, and perhaps some teachers, have thought of class discussions as simply ways to find out if students know the right answers. This elicitation approach sees a class discussion as only a series of teacher questions, student answers, and evaluative responses by the teacher:

Teacher: John, what's the capital of the United States?
John: Uh, New York?
Teacher: No, Mary?
Mary: Washington.
Teacher: Right.

However, there is another kind of language interaction in which students and the teacher together share in a *conversational partnership* to jointly build a framework of knowledge. The teacher's comments and questions are substantially different. What the teacher says builds on and incorporates what students have said, so that the students' thinking becomes part of the teacher's framework.

Following is a transcript of a kindergarten classroom discussion about how plants grow from seeds (Lucas and Border-Simmons, 1982).

The Seeds Lesson

Teacher: I need to talk with you for a minute so you'll be able to watch back there on the science table to see what's going to happen to your plants. What do you suppose a plant needs, the seeds need, in order to grow?

S[1]: Oh I know.

Charles: Plenty of sunshine.

[1] Note: When a student could not be specifically identified from the videotape, the initial "S" is used.

Teacher: Now I'm not going to call on you until you stop yelling out.

S: In the ground.

Teacher: Someone says that you put the seeds in the ground, and then after the seeds are in the ground, then what's coming down on them?

S: Rain.

Teacher: It has to have water and someone has just said we have to have water on our plants.

Charles: And we have to have plenty of sunshine.

Teacher: And they have to get some sunlight.

Ken: So, so, so, so . . .

Teacher: So, Katrine, this is what the seeds have to get.

Ken: So the rain'll stick on, stay on.

Charles: And there, they're cracking open the plant.

Teacher: The plant that you planted yesterday will have to have water on it. You 'll have to see that it gets some water today. And it'll have to have some sunlight. And after the seed begins to get some sunlight and rain, something happens to it right away.

Rachel: (Inaudible)

Teacher: Yes, it comes up. And Rachel says that there's a little plant inside of that seed. So the plant does something. Now let's look at (it). Look what happens. (Shows plant roots.)

Ken: And the roots come out.

Teacher: That's right. What do you suppose happens?

Ken: If they didn't have roots they wouldn't grow.

Tammy: And they would die.

Eve: They, they, they, they. You have to have. The reason why plants have to (have) roots to stay underground.

Eve: So they could stay up.

Teacher: Well, those are some good answers. But where else does the plant get its food, from what, children?

Eric: Plant food.

Teacher: Someone said that it keeps it standing up. That's a good answer. And also it gets its food through that root. And then something else will come out of that little plant, too.

Ken: The plant!

Teacher: As you see right here (holds up plant) something else will come out of that. What's coming out of here, children?

Ken: The plant!

Teacher: Yes, well the whole thing is the plant, here, but what is this part (points to stem)?

Ken: The stems!

Teacher: All right. That's the stem part of it. And what else will come out of here?

S: The flower.

Teacher: Well before it gets to the flower.

Charles: The plant!

Teacher: What else? What's another part of the plant—anybody have an idea?

Teacher: What about the leaf? What about the leaf of a plant?

Eric: The leaf of the plant (inaudible) the leaf of plant starts growing. The plant just starts growing and then all the leaves comes out of the stem.

Teacher: All right. So the leaves come out from there. Now children, I want you to be some little plants for me. Who wants to, who wants to be a little seed for me?

S: I do! I do! (Eric, Derek, Joyce, Tammy, Donna have hands up.)

S: Me.

Teacher: All right. Get yourselves down and make yourself a seed. Now how do you suppose a seed is? (Children all curl up.)

The example illustrates what is meant by the claim that teaching and learning occur through a cooperative conversational partnership. It shows the teacher actively modeling a way of thinking about what a plant is and about the process of growth—at a level which students not only can understand, but can participate in actively. Instead of the teacher asking many questions and students giving one-word answers, each child thinks aloud about what he or she knows. The students feel free to build on each other's answers instead of always waiting for the teacher to speak.

A metaphor used to describe this process is "interactional scaffolding." The term means that the adult establishes with students a common goal and then actively engages them in finding out together how to reach it. The teacher builds a scaffold, or framework, to hold each child's contribution, along with the teacher's, as they converse. The children are actively constructing the knowledge with the teacher—which is the goal. It is more than just getting the "right answer"; it is a process of jointly building knowledge.

The goal, in this instance, is to understand how a seed grows into a plant. The teacher could have given a minilecture—a monologue—and simply told the children about seeds, roots, stems, and leaves, and how they absorb water. Instead, she engages in a dialogue, which has lots of "openings" for students to make contributions. You might want to review the transcript and mark the students' contributions.

Also, the teacher does not evaluate each answer immediately as to its "rightness" or "wrongness." Instead, she incorporates the best answers into the framework that she already has in mind. You can identify in the transcript where the teacher incorporates students' responses into her next statement. When Charles mentions sunshine too "early" to fit the framework that she is constructing, the teacher at that time does not respond to his idea, but lets him offer it again five turns later, when it fits, and then incorporates it.

An analysis of students' responses in the lesson shows that they understood it as a *mutual* conversation. As the lesson progresses, they stop raising hands to be "called on" and simply listen and then talk when they understand and have something to offer (Lucas, 1981).

The heart of the seeds lesson is that students become deeply engaged in thinking together with the teacher, and the teacher no longer needs to regulate turn-taking by having students raise hands and wait to be called on. The structure of the teacher's "thinking aloud" becomes the means of regulating turns in the dialogue.

When students fail to provide the most appropriate piece of knowledge, as in the case of identifying the stem, the teacher recycles questions and gives more precise instructions as to what part of the plant she means until Ken says "the stem." These strategies are ones that we use with friends in any mutual conversation.

This may seem very ordinary to many teachers because it is the way they teach. But what occurs is an excellent example of the *mutual* construction of world knowledge, in which no child feels that what he or she says is "wrong."

Discussion of another kind of student-teacher dialogue, this time in writing, follows. The point of using both oral and written dialogue examples is to show how complex and varied student-teacher interactions can be and to convince you—if you still need convincing—that classroom dialogues are rich instances of how children's thinking can be developed through language.

Written conversations: another way of thinking together

Using "dialogue journals" is another way in which language interaction involves a teacher and student in thinking together. These journals are private written conversations between each student and the teacher, daily or weekly, about whatever topics and concerns that the student wants to discuss (Staton, Shuy, and Kreeft, 1982). In the seeds lesson, the teacher initiated the task and established the goal: "So you'll be able to watch back there on the science table to see what's going to happen to your plants." By contrast, in using dialogue journals, students generally initiate topics, thus bringing up problems that they want to solve (the goal). The teacher's role in the dialogue becomes one of helping the student to see his or her experience from a different perspective, and to suggest how actions and outcomes are connected. Again, student and teacher are thinking together, and the student can observe and participate in the teacher's way of thinking.

The two excerpts are from dialogue journals of sixth-grade students in Los Angeles and their teacher, Leslee Reed. They concern two very different kinds of experiences—a science experiment and getting along with other students. In both cases, the student selected the topic, and then the teacher and student became involved in thinking together about how to accomplish a goal: "finding out what happened" in the science experiment, and "handling the problem of Dino and taking cuts" in the second example. (Note: These excerpts are from writing done in winter or spring periods of the school year, after the students have become comfortable and familiar with using this written conversation as a way of communicating with the teacher. These passages have been typed from the handwritten originals.)

Day 1

Tai: Mrs. Reed I would like you to think up something like rainwater or coke and sugar and we would both try it and tell what happen Monday.

Mrs. Reed: Okay! I have an idea for us to try. Dissolve as much salt as you can in ½ cup of water. (Do you think heating the water would help to dissolve more salt or less?) Tie a string on a pencil and put the pencil over the cup, letting

the string hang down into the salt solution. (Cut off string if it is too long, it should reach just the bottom of the cup). Now put it where you can see it and record any changes you see.

Day 2

Tai: Today swooshed by. I am going to do that exsperient. I'm going to keep record every minute up to five. I think heating the water would dissolve it faster.

Mrs. Reed: Good! I'll do my experiment, too.

Day 3

Tai: I did my experiment and all my water evaporated except a little but I left it overnight with some salt and I used warm water and most of the salt stayed in the cup and then I started making my record I waited one minute and I saw the salt coming together and every time I made a recort the salt would start coming together on the string . . .

Mrs. Reed: My experiment is still working! The water in the cup is evaporating, but most of it is still there. I'm getting some salt crystals growing on my string.

Day 3

Tai: Where is your cup at in the house? I put mine in the kitchen.

Mrs. Reed: I have my experiment sitting on the counter in the kitchen, too. Did you find the measure of water we were to have used? My crystals are growing a little everyday. Are yours?

Day 4

Tai: Yes ½ of a cup. Mine is still trying to dissolve. If you can bring yours tomorrow to see what is happening . . .

Mrs. Reed: I won't bring my experiment until Monday. It got bumped twice so it is just now "growing." I'll bring it on Monday.

Day 5

Tai: OK I'll bring mine.

Mrs. Reed: I will try to remember my salt crystals, too . . .

Day 6

Tai: Your experient looks like mine exept mine isn't on the side of the glass.

Mrs. Reed: Do you think it would be interesting to look at those crystals through a microscope? What would you see?

Day 7

Tai: I do think that would be nice to look through a microscope could I? I don't know what I'll see unless I do it.

Mrs. Reed: I'll get a magnifying glass if you'll bring in your experiment, too. Why do you think the crystals continue to grow?

Day 8

Tai: As the water evaporates the salt goes up in the air with it.

Day 9

Tai: I meant to tell you I spilled the exsperient but I couldn't bring it on the bus cause it would spill.

Mrs. Reed: Oh! dear! Now I can't see your experiment!

Two pages of this student's dialogue journal are shown on the following page to show how the science experiment dialogue is one of several topics interwoven in the written conversation between Tai and her teacher.

The second example that follows shows the same teacher using more explicit strategies for focusing this student's thinking, in a situation where it is more difficult for him to use his thinking and reasoning skills on his own.

Day 1

Gordon: I really don't care if I don't make hot dog griddles or whatever you call them. And also I don't think that you

understanding problems. Would you see if you can help? Yes I would Have to talk to you about Joan.. Now Im glad I got that over. Today I got so overworked but I felt good. I am so happy cause I might be staying after tomorrow. No I never tried rain water in a cup but when Its going again I will. Mrs Reed. I would like you to think up something like rainwater or Coke and sugar and we will both try it and tell what happen Monday. Thur. Jan. 24

Thanks for your help. You not only help but you are trying to set a good example for others.

Okay! I have an idea for us to try. Dissolve as much salt as you can in 1 cup of water. (Do you think heating the water would help to dissolve more salt or less?) Tie a string on a pencil and put the pencil over the cup, letting the string hang down into the salt solution. (Cut off string if it is too long, it should reach just the bottom of the cup) Now put it where you can see it and record any changes you see. 

You are doing great as the costume planner and as Tonio's mother! Keep it up! Today swooshed by. I had fun doing the play. I am going to do that experiment I'm going to keep record ever minute up to five. I think

were fair when Dino hit me. You didn't even say anything to him. He got of really easy and it just isn't fair. What's wrong with getting cuts. Its just that my friends give me cuts. But I don't really care.

Mrs. Reed: I did not see Dino hit you—I saw you hit Dino. Did you have to hit him? Was there no other possible way of handling that problem? You tell me what is wrong with taking or giving cuts in line? It sure makes you happy when 4 or 5 people in front of you give cuts to their friends doesn't it?

Day 2

Gordon: I did not have to hit him. But I felt the need too. Yes there were other ways of handling the problem. But I didn't think of them at that time. Well one thing wrong is people don't like it.

This student begins with a complaint about the teacher's "unfairness" and gives some information about what happened. The teacher adds to his description some relevant new information about the occurrence from *her* point of view. The teacher does not initiate the topic, but she focuses the student's attention on his own behavior and responsibility for making choices in order to help him "rethink" the problem. She suggests that there were alternative actions that he could have taken. She models a way of thinking about a fight by raising questions which require a reflective response from the student: Was there something else I could have done?

The student's response at this time shows that he has understood the teacher's thinking and entered into her framework of meaning (but we note that she has also entered into his, using his language and talking about his concerns). The reflective questions about a concrete situation can be internalized and become part of an inner "dialogue" which the student can use independently later.

A CLOSER LOOK: HOW DOES DIALOGUE WORK?

This section takes a closer look at the way in which conversational participation in a dialogue works to help students internalize more flexible and mature ways of thinking about the world and their experiences. Discussed first are some obvious differences between unfocused, classroom interactions and the thoughtful, directed dialogue already described.

Then, the concept of "interactional scaffolding" is described as a partial way of explaining how dialogue can work. We want to stress "partial" because such research concepts are still inadequate to explain all that occurs in language interactions.

Finally, a set of "conditions for dialogue" is described which facilitate the process of "thinking together," and which you already may be using, or may find helpful to use, in your classroom.

Invoivement without much "thinking"

There is a major difference between just having students respond freely and talk about whatever they know and engaging them in a structured topic discussion which demands their thinking. Of course, there is value in developing children's use of language through discussion circles and sharing time. But there is no evidence that indicates that an unstructured discussion which has no specific goal really involves students in actively confronting different viewpoints or acquiring new concepts.

An example of the point that just any language interaction does not automatically involve cognitive "scaffolding" is found in the following transcript of a language arts lesson (Shuy, 1980). The transcript is of a second-grade teacher and her class discussing Abraham Lincoln and shows extensive student-teacher language interaction. (This, too, is an actual transcript from a videotape of a regular classroom.) At the start of the lesson, the teacher has just read a short poem about Lincoln which contains the lines:

"When Abraham Lincoln was a boy,
He never had a store-bought toy."

The Abraham Lincoln Lesson

Teacher:	Was Abraham Lincoln unhappy because he didn't have a store-bought toy?
Students:	No.
Teacher:	No, because hardly any of the children had store-bought toys. What do you think Abraham Lincoln played with when he was little? Any ideas?
Students:	(not intelligible)
Teacher:	OK, now try to think now. He was way out there in the woods.
Student:	I know!
Teacher:	What would he play with?
Nancy.	Animals?

Teacher: Animals. He probably had some pets. What else? George?

George: He had the Bible book?

Teacher: He did have the Bible book, but he didn't play with it. What else would you play with if you were way out in the woods, and didn't have any toys?

Student: Dirt.

Teacher: Bill.

Bill: Carve, carving.

Teacher: Yes, he probably carved some things out of wood. What else, Robert?

Robert: He play with mud.

Teacher: He probably made some things with mud. What else?

Student: Out of dirt.

Teacher: Uh, huh. With dirt. He probably had all kinds of ways he could play. Uh, huh, Julie?

Julie: With sticks and stones.

Teacher: He probably did play with sticks and stones.

Students: Break my bones. (laughter)

Teacher: You could have a game with sticks and stones.

Several S: Uh, huh. Break my bones.

Teacher: Sure you could make sticks like tic tack toe. (Crosstalk among students increases.)

Rosie: Sticks and stones will break my bones, but words will never hurt me.

Teacher: That's a poem. How many of you know that one? (hands) Uh, huh. OK.

Teacher: What do you think Abraham Lincoln played with when he was a boy? All right, let's let Emily say what she thinks.

Emily: Animals.

Teacher: She thinks animals. He probably loved having a pet.

Student: Played with squirrels?

Teacher: Played with squirrels. Maybe he had a little pet squirrel. You'd have . . .

Student: They bite fingers.

Teacher: They do bite your fingers. So when would you get a pet squirrel? When would you have to get a pet squirrel, Jenny?

Jenny: . . .(unintelligible) gloves . . .

Teacher: Well, maybe he didn't have any gloves. When would you get a pet squirrel, John?

John: When they're old.

Teacher: When they're old. When they don't have any teeth? Well, that's a good idea. When would you get a pet squirrel? (to another pupil)

Student: When it's a baby.

Teacher: When it's a really tiny baby. OK, when you get an animal when it's a baby, what can you do?

Teacher: Yes, you can train it. Juan, what did you want to say?

Juan: Um . . . he could play with deer.

Students: (Much unintelligible "crosstalk" to each other.)

Teacher: It might be fun to have a little wild animal for a while. Do you think he kept them all the time?

Student: (More unintelligible crosstalk to each other, ignoring teacher.)

Teacher: We've talked about Abraham Lincoln. Now . . . I want to go over what we've talked about . . . .(Teacher goes on with next point.)

The teacher ensures that many students contribute ideas from their own experience. But the students are controlling the topic of discussion—when they stray off the topic of Abraham Lincoln, the teacher follows *them*. The teacher does not provide an initial goal or problem to be thought about or solved, and she does not make explicit the comparisons or conclusions which could be drawn. The students know what they are to discuss—something about Abraham Lincoln's toys, but not *why*. At the end, it is hard to define what the students have learned from the discussion, although much talk occurred.

The teacher's purpose may have been to get students to see how different Abraham Lincoln's life was from their own; but if so, neither we nor the children know, as she never states her point. She simply allows children to talk about pets and wild animals from their own experience. The teacher does not model strategies for focusing attention on a problem or questioning or making comparisons; the discussion is circular and ends up in a clutter of information. At the end of this segment, most students are talking with each other, probably about pets, and have tuned out the teacher.

In analyzing a number of videotaped classroom lessons, Roger Shuy found that teachers like this one, who structure all language interactions with students by just "letting everyone get a turn," cannot "build vertically toward larger knowledge . . . but inch forward slowly, never fully revealing the right answer" or goal (Shuy, 1980). What is lacking in the lesson is not language use, but a *goal*-directed use of language to bring into contrast different ideas and to find their relationships.

Concept of interactional scaffolding

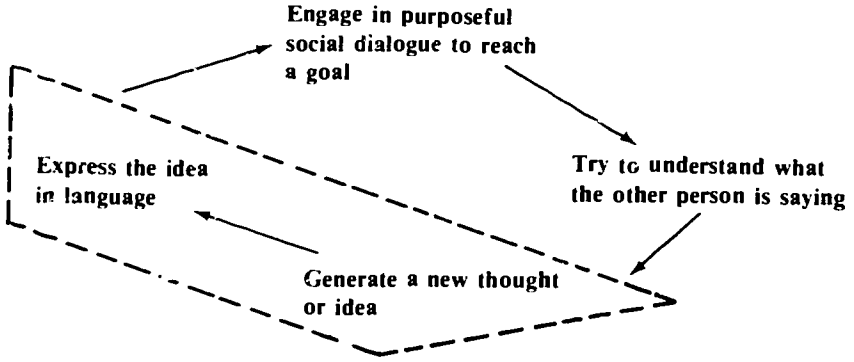
What teachers can do best (and what no textbook, skill pak, or computer is designed to do) is to engage individual students in active mental processing of their current experience and knowledge in such a way that both new concepts and general strategies for thinking are introduced. Students need these concepts and strategies to understand themselves and the world around them. The examples show how teachers can engage students in thinking together with them while going through a process or problem.

Recent research into classroom interaction shows that this type of focused, guided interaction has a *direct* connection to student learning and achievement. What some researchers call a cooperative, conversational partnership about significant topics (Cahir and Lucas, 1981) and which some call "interactional scaffolding," allows the student to build on and use the teacher's *actual thinking* process (or that of a more advanced peer) to reach a goal or solve a problem which the student could not do unaided.

We usually think of the relationship between language and thought as a one-way street:

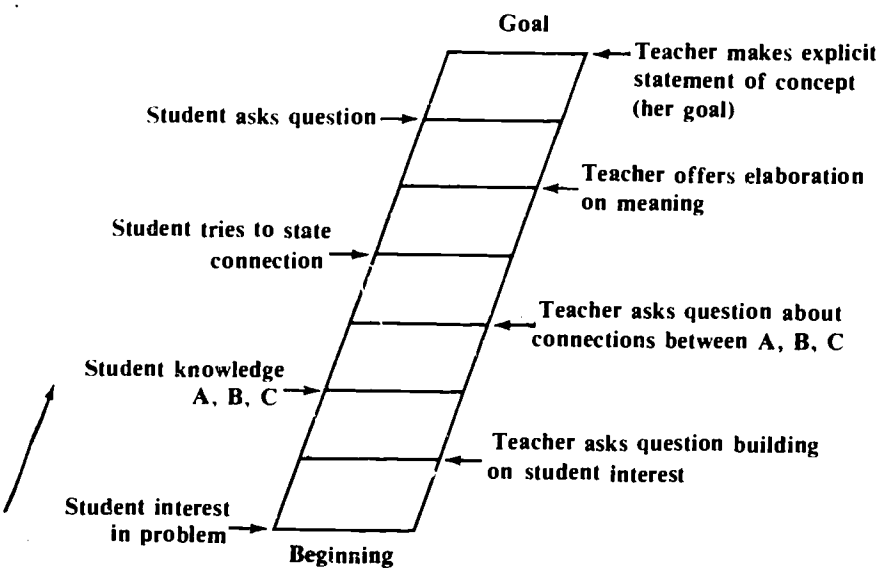
Have a Thought or Idea ——→ Express the Idea in Language

But an interactive perspective enlarges the field of vision to include the social and mental activities which lead to a particular linguistic utterance.



Of course, if we only look at the events within the dotted line, as the first diagram does, we will not see the earlier interaction between thought and language.

In a dialogue about a shared goal or problem, not only is there a struggle for comprehension of the other speaker's or writer's statement, but the process repeats itself, in a special pattern, each person's statement building on the others. Visualized as a conversational "ladder" with both persons contributing different rungs, this process could look like this:



For some students, the teacher may need to do relatively little scaffolding; for others, at first, the teacher may need to take some of the student's turns. Scaffolding works when the student has an interest in a problem or is motivated to become engaged in the process. Often, the goal may be clarified only as the process is worked out. As mentioned, this kind of conversational partnership is familiar among friends, who reach for a *mutual* understanding of a problem or experience. Each person has the freedom and responsibility to contribute to the discussion whatever he or she knows without being "put down" or negatively evaluated if a response is off track.

Eventually, the student, by *internalizing* the teacher's language strategies, should be able to take over much of the process of thinking. The teacher's questions become internalized as self-guiding questions: "What comes next?" and "What's the connection between what I did and what happened?"

The students' statements are not sufficient to accomplish the task initially. The teacher appropriates them into his or her own knowledge structure (or "schema") at the right time (as we saw in the seeds lesson) to reach the goal. With repeated interactions, students incorporate the teacher's strategies into their own thinking and begin to carry out the task independently.

A helpful example of this is found in a transcript of a teacher helping a kindergarten student learn how to narrate a story that she has just heard. When reading the transcript, look at how the student "turns" lengthen and how the teacher uses questions to support and extend the student's thinking by filling in the necessary information so that Karen can complete the task (McNamee, 1979). At the end (line 72), Karen has even internalized question-asking and directs the teacher to help her when she needs it!

The Five Chinese Brothers Story

Karen (5 years old) retells the story of The Five Chinese Brothers to her kindergarten teacher. (Karen has just heard the story 5 minutes ago with the rest of the class.)

1. **Teacher:** Tell me the story of The Five Chinese Brothers.
2. **Karen:** I don't know this.
3. **T:** What could the first Chinese brother do?
4. **K:** I forgot.
5. **T:** Remember he went fishing?
6. How did he find all the fish?
7. **K:** He drink the water.
8. **T:** Right.
9. Now what could the second one do?
10. **K:** I forgot.
11. **T:** Oh remember they tried to cut his head off?
12. **K:** That's the one with the iron neck.
13. **T:** And the next brother . . .
14. **K:** could stretch and stretch.
15. **T:** Karen, you do remember!
16. You thought you didn't but you do.
17. **K:** (her face lights up) I thought I didn't but I do.
18. **T:** Now how 'bout the fourth.
19. **K:** (silence)
20. **T:** Remember they tried to burn him?
21. **T:** Oh that's the one who couldn't be burned.
22. **T:** Now the last one, the fifth one.

23. K: The mother.
24. T: Remember the brother they put in the oven so he couldn't breathe?
25. K: Then he could hold his breath?
26. T: Right.
27. Forever.
28. What happened when the first Chinese brother went fishing?
29. What happened?
30. K: He drank the water.
31. T: Then what?
32. K: The boy came?
33. T: See you do remember!
34. K: He said "can I go fishing?"
35. He kept begging.
36. "OK, I'm going to make a sign for you to come back."
37. Then he drank the water.
38. He made a sign for his hands to come back.
39. And the boy only made faces.
40. T: What a nasty boy.
41. K: He thought he was going to burp
42. and all the water came out
43. and the boy disappeared.
44. T: So then what happened?
45. K: He had to go to the judge.
46. T: Yeah
47. K: "Can you only to say my mother goodby?"
48. "It's only fair."
49. And the second Chinese brother came back to his place.
50. That was the one, that was the one that had the iron neck.
51. T: So what happened with the one with the iron neck?
52. K: They tried to cut his head off.
53. T: Were they able to do it? (laughing)
54. K: (laughing) No.
55. Or he could go to the judge.
56. And the judge said . . . oh no, I *know* this.
57. The Chinese brother said "Do you only to bid my mother goodby?"
58. and he said its only fair.
59. So the four Chinese brother came back to his place.
60. That was the one who could stretch and stretch and stretch.
61. (Karen's face is lit up, eyes shining) They tried to throw him in the water
62. but he was ordered to go to the judge
63. and the judge said . . . I mean the Chinese brother said "Do you own me to bid my mother goodby?
64. "It is only fair."
65. And the fifth Chinese brother came back to his place.
66. That's the one that . . . that was the one that . . . I'm talking about the fifth.
67. That was the one can be burned.
68. They tried to burn him
69. but he was ordered to go to the judge.
70. The Chinese brother said "Do you owe me to bid my mother goodby?"
71. She said "it's only fair."
72. What comes after the fifth?
73. T: Now let's see, they couldn't cut his head off, they couldn't drown him, they couldn't burn him,
74. so finally what did they try to do?
75. K: They stuck him in the fire?
76. He couldn't be fired?
77. So he was ordered to go to the judge.

78. And the Chinese brother said, "Do you owe me to bid my mother goodby?"
79. She said "it's only fair"
80. and that's all.
81. Does something else?
82. T: So they couldn't drown or burn or cut off his head.
83. Remember the oven?
84. K: Oh yeah.
85. They put him in the oven.
86. It was filled with fire.
87. So they tried to get rid of him.
88. That's all.
89. T: Did they get rid of him?
90. K: Oh no, I know they couldn't! (she laughs, obviously pleased with herself)

The theory of interactional scaffolding is based on the original work of Vygotsky (1978), as developed by others (Cazden, 1979; McNamee, 1979; Wood, Bruner, Ross, 1975). The theory assumes that only through a social dialogue can young students learn how to think about experience.

The interactional scaffolding can include all of the levels of knowledge organization suggested by Benjamin Bloom in his taxonomy of knowledge: recalling, understanding, relating, analyzing, synthesizing, evaluating (1956). Interactional scaffolding, however, describes how children participate in and understand all of these levels *before* they are able to use them independently. Since Bloom looked only at students' independent, noninteractive thinking abilities, his taxonomy is often taken to mean that primary school children can operate only at the lowest levels. In fact, many students will make an *evaluative* comment at the end of the dialogue, showing that they did follow and understand what the teacher was saying and can follow the reasoning all the way to the goal. By giving students many opportunities to participate with them in a dialogue, teachers are giving them the opportunity to internalize all of the levels of cognitive representation that Bloom suggested.

Conditions for dialogue

By examining what is common to the examples in the second section of this booklet, we find a set of conditions teachers can establish to ensure that students are engaged in active mental processing, or "thinking," in language interactions or written dialogues. Although the examples just cited seem very ordinary in their language, they are not accidental or unsystematic. The teachers involved have established conditions which appear to include:

- *a common goal* which both or all participants want to accomplish, and which is understood by each;

- *modelling* by the teacher of strategies for reaching that goal, within the language interaction, as it proceeds;

- freedom for participants to try out *alternative answers* or *strategies* at each step in reaching that goal, without any external penalties for being "wrong"; and

- conscious, verbalized *feedback* on the effectiveness of the mutually constructed progress toward the goal by pointing out the causal relationships between different actions or combinations of actions and the outcome. This verbal feedback occurs only after enough successes and failures have occurred for the information to be meaningful to the learner.

The first example, the seeds lesson, shows how the teacher established those conditions in terms of her language strategies. The following chart shows a simplified version of the teacher's language in the left column and describes and labels in the right-hand column the strategies used.

Examples from the Teacher's Language in the Seeds Lesson	**Teacher Strategies**
"*What does* a plant need in order to grow?"	Establishes *goal* and focuses attention on relevant aspects or attributes of the event or experience.
"It has to have *water*. They have to get *sunlight*."	Identifies and compares aspects by explicitly naming and categorizing.
"And *after* the seed begins to get some sunlight and rain, something happens?"	Incorporates child's prior experience and world knowledge into discussion.
(Response)	
"Yes, it comes up, and Rachel says there's a little plant inside of that seed so the *plant does something*?"	

"A plant must have water, sunshine, for seed to come up and a stem will come out of the plant and leaves.	Makes explicit the relationship inherent in the experience which constitutes its meaning (knowledge basis for predicting similar experiences in the future).
"Those are some good answers. But what is this part? Well, before it gets to the flower?"	Gives explicit *feedback* on effectiveness of mutally constructed activity.
"Now I want you to be some little plants for me." (Has children physically enact sequence.)	Connects knowledge to students' own experience, activity.

This example pinpoints how the teacher embedded in her conversation with the students a clear set of strategies for thinking in such a way that they could actively participate with her in constructing the answers, without first knowing everything about plants and seeds. Each child had ample opportunity to try out possible answers without being penalized, while the teacher fitted them into place in the best sequence.

Another instance of teacher-student dialogue can be found in dialogue journals, in which it is shown how the same strategies are used in helping a student understand that he can learn and is not a "dummy." The student is a sixth-grader who speaks Spanish at home and has limited proficiency in English.

	Student-Teacher Dialogue*	Teacher Strategies
Day 10:	Eduardo: Mes. Reed, I cant do it I ges can't do it. I em a dime. my cetres (sisters) tel me the dime and all my famele tel me the dime my mom tel me I have a good mind Mes R I want to lorn efi dont I no I can lurin sumer (learn some more) on reed and on spell mor	
	Mrs. R.: Good! If you want to learn you will. I will be happy to help you—but I cannot learn for you. $7 \times 8 = 56$, what is 8×7 $6 \times 9 = 54$, what is 9×6	Frames common goal and process: 'I will help, but I cannot learn for you.' Focuses attention on relevant aspects of event: learning, will to learn, and doing (timestables).

* Typed from handwritten original.

Day 11:	Eduardo: Mes R I now more fracens and mor timstebol (timestables) and to reed mor and rid (write) mor I like thes day	
	Mrs. R.: You must read more and write more every day. I will make you some math cards to study at home.	Gives explicit feedback on what actions are needed to achieve goal.
Day 12:	Eduardo: I don't want to lurn. I genh (change) my mind I het schcol I want to be a dime.	
	Mrs. R.: You can be what you want to be. If you can read and write and do math you'll be better at whatever you decide to be.	Makes explicit causal relationship inherent in the experience.
Day 13:	Eduardo: Mes R I now Im a dume and I want to be a dume I dont want to lurn nothen Good by	
	Mrs. R.: I care! You have a million dollar brain! Someday when you are driving a big fancy car you'll be glad you worked. You are not dumb!	Connects goal and activity to student's own experiences, frame of reference.
Day 14:	Eduardo: Then you (thank you) Mrs. R it you cares and my mom dus cares to and one of my sestrs cares too.	

This example shows that even very brief statements by a student reflect his or her thoughts. Usually, teachers respond to student writing by focusing on errors in language forms. In dialogue writing, this teacher is responding to the student's thinking and focusing him on understanding the problem. By allowing the student to express his thoughts without fear of being corrected for errors, and by "listening," the teacher is able to participate with the student in a mutual effort.

The written dialogue with Eduardo about his desire to do better in school continued all year. By spring, the teacher's efforts had paid off: Eduardo did change his way of perceiving himself and came to believe that if he tried hard, he could do sixth-grade work. Here is a sample from Eduardo's journal:

Spring 1979*

Day 80: Eduardo: Mes. R. I had a good dy I can do berer an everythin and I can. Mes. R. I hope I can gate my gurnol and I well rite more and raed more . . . and I had a good reces and a good lunch I play far and I had a good day and I I got ever bory out in sococ and a sococ ges ones they got me out and we wan all the games and we play And I had a good day in math I got 100 and Mer M.he was happ and I had a fantatic day Mes. R. I we be good and I love all the world Good by

Mrs. R.: Wow! I could not believe you wrote so much in one! That is good. That is super good. If you play fair the other children will like you better. You raised your hand and answered questions very well today. When you listen and think you are very smart.

This typical entry from his journal in the spring shows that Eduardo has incorporated into his own thinking much of how the teacher thinks: "I can do berer (better) an everythin," "I will rite more and raed more." His entry reflects a much more positive self-concept, greater fluency, and a better command of written English conventions.

DO DIALOGUE AND SOCIAL INTERACTION REALLY HELP STUDENTS THINK DIFFERENTLY?

The problem with this kind of "thinking together" is that it does not automatically produce a product which can be assessed or graded. As teachers experience greater pressures to be accountable for children's learning on an almost daily basis, it may even become harder to justify time spent on activities—such as "just talking" with students or carrying on a written dialogue—which are never graded. Genuine thinking may be very exciting for both students and teacher but much harder to measure than whether students can fill in the right blanks to show that they have memorized some facts. Teachers are right to ask if there is theoretical and empirical research support for the value of such interactive dialogue.

Cognitive development is interactively facilitated

Most teachers are familiar with Piaget's theory and research into the way children's minds develop through cognitive "stages." Although Piaget emphasized that his theory was an *interactive* one, in which the child's mind developed through direct interaction with the world of objects and people, the mechanisms of interactive development were not well understood until

*Typed from handwritten original.

very recently. Now research has begun to study the *process* of cognitive development and the mechanisms by which new operations are formed. What has been found is that language interaction appears to play a major role in facilitating transitions from one stage to the next. A typical experiment goes like this:

> **A child who is not at the stage of understanding the "conservation" of liquids when the visible shape or appearance of the container is changed, is asked to work with two other children who *do* understand conservation. The nonconserving child is the "operator" who must divide up juice equally so the two other children "have the same" amount even when their containers are of different widths or heights. The two "conserving" (more cognitively advanced) children are to judge if the division is fair, and can argue or explain how to do it, and why to the child who is pouring—in effect, to teach through dialogue (Perret-Clermont, 1980).**

In many experiments using this task, the findings are that:

- after one or two experiences, a significant number of nonconserving children had acquired the concept of the conservation of liquids;
- this change was *not* a matter of verbally "imitating" what the other children said—in posttests, the students came up with *different* (but equally valid) arguments to explain why the amounts were the same, than the arguments that they had actually heard in the teaching situation; and
- these changes are durable over time and reflect genuine reorganization of thought.

The "mechanism" for effecting this change is the verbal conflict which occurs in viewpoints as the children discuss which glass has more. During the teaching situation, children who are nearly ready to move into this new stage of concrete operational thinking (usually 5-7 years of age in our culture) are confronted with contradictions between their way of describing and explaining events and the way the conserving children explain it, as they talk together. These contradictions set up the imbalance or disequilibrium in their thinking, and "demand" that they adopt a more flexible view: "There's the same in both glasses because this one's wider but this one's taller."

Other researchers have shown that such changes cannot be produced by having children memorize and practice saying the "correct answers." When children are simply taught by an adult to say lines perfectly in an experimental situation, they cannot solve a new problem (Sinclair, 1969). But children involved in the situation in which *genuine* arguments occur about which glass has more are led to integrate two different ways of thinking into one concrete operational principle.

What these studies indicate for classroom practice is that having students involved in tasks in which they must use language to solve a problem allows them to begin working at a level of cognitive operations one step up from where they can work unassisted. Gradually, the processes first experienced and understood in interactive situations are internalized and made an integral part of each student's own thinking. This internalization occurs not at the "factual" level of learning/memorizing the right answers to teacher questions, but at the conscious level of learning how a more experienced member of the culture 'thinks" through a process in order to *ask* questions. The process of internalization involves transforming overt language utterances into covert or "inner speech." In a way, human learning is a matter of learning how to ask a series of questions of oneself deliberately to focus attention, to search out the connection between events—which is called *meaning*—to "take on" the adult's or teacher's turns as well as one's own in directing the search for meaning.

Social interaction affects reading performance

In a study of reading in the Kamehameha Early Education Project (KEEP) in Hawaii, the language interaction styles of two teachers were contrasted in teaching the same group of children a reading lesson (Au and Mason, 1981). One teacher used a culturally familiar language experience, the Hawaiian "talk-story," as a way to help students understand the reading lesson. In the talk-story, everyone can join in to build a story narration without waiting to be called on individually. The teacher does not control each individual child's opportunity to have a turn. The second teacher followed a traditional style of calling on each child individually to give the right answer; children had to wait and raise hands before speaking.

The talk-story group produced a much higher level of academic engagement in reading. Also, the students who participated in the culturally familiar interactive participation gave more on-topic responses related to the story that they were reading and discussing, and made more logical inferences (Au and Mason, 1981). The real difference between the two styles was that in the talk-story class, teacher and students were all equal participants in the discussion. Students were not thinking about whether what they said would be "right" or "wrong" from the teacher's perspective. Instead, each child had many opportunities to initiate sensible ideas, and a second child could build on the first child's statement as soon as the second child understood what might be a good next response. Children did not have to wait for the teacher to tell them if they were right; they could just go on *thinking* about what they knew and join in freely. This conversational style of dialogue focuses the children on what they know, and on making connections. One result of the greater amount of really concentrated thinking in the talk-story classroom was that those students had *more* time for discussion of reading and for sustained silent reading than did the students taught in the traditional elicitation manner, which tended to take up most of the available time.

Interaction impacts reading achievement

The results of a large-scale study by Jane Stallings of classroom interactions

in a large number of high school remedial reading classes lend impressive support to the argument that direct student-teacher language interaction is a primary—and powerful—force for learning (Stallings, 1980).

The classrooms were observed and the various activities recorded by trained observers. For analysis, observed activities were divided into "on-task" and "off-task." On-task activities were further divided into interactive and noninteractive categories. The *interactive* on-task activities included discussion/review, reading aloud, drill and practice, and praise and support in reading tasks, and supportive, corrective feedback. The *noninteractive* on-task activities included classroom management, silent reading, sustained silent reading, and written assignments. Off-task activities included organizing, social time and disciplinary activities. The researchers initially expected that most of the on-task activities would be positively associated (statistically correlated) with reading gains. But surprisingly, none of the *noninteractive* on-task activities, such as silent reading or filling out workbook assignments, were positively associated with student reading gains. In fact, significant *negative* associations were found. This means that the more time students spent in noninteractive activities, the *lower* their reading scores.

All the activities positively associated with reading gains involved language interactions—discussion, teacher feedback, oral drill and practice. What made the difference for these remedial readers at the secondary level was engagement in focused interaction using language. The study also found that students at the lowest reading levels (first to fourth grade) gained most from the interactional instruction activities. Off-task activities directed at just managing the classroom had the same kind of negative association with reading gains as did noninteractive instruction.

Students become more independent in thinking

Most teachers will want evidence that having students do more cooperative social interaction tasks will lead to truly *independent* thinking. It is one thing to be able to solve a problem cooperatively with someone else helping; it is another to do it alone.

Evidence for growing independence stemming from the cooperative situation can be found in the study of student discussions of problems in the dialogue journals described earlier. Because the discussions cover several months of the school year, there is an opportunity to observe the gradual process by which the student incorporates some of the teacher's thinking about an event or problem, and then uses those concepts and ways of constructing the world independently or voluntarily.

These examples are from the journal of a sixth-grader who wants to do better in math but does not know how to accomplish the goal (Staton, 1982b).

Day 22

Gordon: Math was great today. I think I should move up in about a month.

Teacher: You really listened well in math today! If you work hard and learn to listen, there is no reason you can't move up.

Day 33

Gordon: I feel I'm getting better in math. I feel that I can move up in the next test.

Teacher: You've been listening better in class. Now if you are thinking, too, you'll really do well.

Day 49

Gordon: Math is really coming along for me.
I really do like it.

Teacher: Super! I like math, too! You are fun, before you even start the assignment you say, "I don't get it." Then I say, "Read it to me, Gordon." You do read it, then what happens! It is fun for me to see you really thinking it out.

The excerpts show the student making the same assertions that he is doing better without any awareness of what kind of effort he will have to make. The teacher keeps reminding him that he must keep *trying, listening,* and *thinking* if he is going to do better and move up. She describes his actions for him, filling in the apparent gaps in his knowledge of the relationship between his actions and the consequences.

Later in the year, Gordon has incorporated the teacher's ideas that *trying hard* and *listening* are essential for doing well. He begins to use these ideas independently in evaluating his own actions, described in the following excerpts. The teacher introduces yet another new idea: Understanding is the key to math being "easy."

Day 87

Gordon: It is fun doing something new in math. And it is also fun, especially when I try my hardest.

Math was pretty easy today. Desmils really isn't hard. But I kind of (had) a bit of trouble doing my work. But I'll keep on *trying to do good** on it. Okay.

* Emphasis added.

Teacher: Good! Decimals are easy—if you understand them.

When Gordon falls back into his earlier pattern of hating every new concept because he does not understand it, the teacher is ready with a reminder:

Day 99

Gordon: I did terrible on the math homework from last night. Math was totally terrible. I hate math. I really do hate it!!!!!!!!

Teacher: Come on! Give yourself a chance. You "hate" every new math idea and in a couple of days you're saying "I like this—it's easy." You'll catch on—let me help.

Day 100

Gordon: That is not true. I did not say that about fractions. Did I?

Math was pretty good today. Even though we had more division which I really do hate. But it was a little bit better today. I am kind of getting used to it. But I still hate division. Hate it.

Eventually, Gordon begins to internalize not only the teacher's ideas, but also her processes of reflection, of comparison, which are first available to him on an interactional, interpsychological level through the dialogue. At year's end, he has begun to evaluate his own performance in terms of this new concept of *understanding* it, and he now looks forward to new concepts.

Day 118

Gordon: Three of the problems on that test were kind of hard. But I think that *other than these three I did pretty good.** Are we going to go on to *something different** on Friday. I hope so, this is really getting kind of fun.

Gordon: I like the math work that we did today. I finished both of the math papers. I finished the last one with just five minutes to go before math time was over.

Summary

Research results concerning the importance of interactive language use emphasize the necessity of language interaction focused on learning events or tasks for developing students' thinking processes. Beyond age 7, the major kind of thinking that develops is reflective thinking about relationships in

* Emphasis added.

increasing independence of contextual cues. Teachers need not laboriously "teach" students how to think this way—they do so naturally and endlessly. But students do need opportunities to use this kind of thinking on a variety of problems and tasks in many different contexts, or their potential ability to think effectively will not develop into competent performance.

Piaget greatly emphasized the need for language interaction as the child grows older. Only language, he said, can integrate many different ideas or "operations" into new structures of thought (Piaget, 1967). Piaget saw logical reasoning as "arguments we have with ourselves, and which reproduce internally the features of a real argument" in which two persons are expressing opposing viewpoints. In a genuine dialogue, the outcome of an argument is a synthesis of these two viewpoints into a higher-order way of construing the world. Involving students in such dialogic thinking allows them to observe, practice, and incorporate another perspective into their own thinking.

What makes oral or written dialogues about topics of mutual interest such excellent learning experiences is that the learner is continually required to make sense out of a different viewpoint to continue the conversation. Gillian McNamee, a classroom researcher, has described how the adult "continually makes demands of the child that are just beyond the child's grasp, and the child then struggles to find coherence in what the adult is saying . . . .The child is continually having to work to make sense out of the adult's questions" (1979).

WHAT CAN I DO?

What can you do as a teacher about engaging students in more thinking together? Many teachers may find it difficult to increase the amount of genuine, engaged dialogue in class because they are so used to looking only at observable student behaviors. The first step, then, is to acknowledge that difficulty and struggle with those natural feelings of guilt and uncertainty. By really increasing the amount of focused, purposeful thinking that you and students do together, the lower-order skills and facts that you already teach will be that much more easily acquired.

The kinds of language interactions described in this booklet are not isolated games to be played once a week, or a unit on "critical thinking." Instead, you need to focus on the everyday processes of a classroom interaction, and ask yourself: How much genuine thinking do *I* do, aloud or in writing, with my students? Do my questions seek information *I* do not know, and express my perplexity?

This section suggests a few ways to increase valuable, structured thinking in the classroom and lists additional resources that you may be able to use. First, it is important to assess your classroom practices and see how much interaction may already be happening. Second, some ideas and resources for restructuring class discussions and student interaction are presented. Third, types and examples for developing written dialogue interactions are described.

Assessing your classroom

Evaluate your daily class activities. You need to see how much interaction occurs and where the possibilities are for restructuring.

1. **How much time do we spend in really thinking together? In what contexts?**

You may feel comfortable with just observing yourself for 1 or 2 days. Or, you may ask a friend—peer or resource teacher or someone from an inservice training program in your district or university—to observe your class several times (or to stay for an entire typical day if you are in a self-contained classroom). The observer records the amount of time spent in each type of activity, using a simple checklist, such as the following. (You can modify this to make it fit your situation.) The checklist tells you how much *opportunity* for dialogue is available. The chart has been filled out to indicate how different academic areas might show very different patterns.

	Academic Areas or Classes	
	Reading	**Social Studies**
Activities (total time)	**50 min.**	**50 min.**
1. Whole-class presentation (one-way teacher monologue)	(20 min.)*	(5 min.)*
2. Whole-class discussion/review	10 min.	5 min.
3. Small-group or panel discussions of activities with teacher participation	0	0
4. Small-group or paired discussions without direct teacher participation	0	20 min.
5. Individual student-teacher conferences	0	10 min. 6 students involved (overlaps with activity 6)
6. Individual student seat work or other independent activity	20 min.	20 min. (overlaps with activity 5)
7. (add your own)		
8. (add your own)		
9. (add your own)		

* Data are hypothetical examples to show how you would fill in such a chart.

With this kind of record, you can decide where you need to increase focused conversations in which you and students participate mutually in finding out and asking why. Effective classroom dialogue discussions have to occur at the right moment when there is a genuine problem or event to talk about in which everyone has opinions, ideas, and information.

2. Listening to your own interactions

Step two would be to review some of your classroom discussions to see if you are already using the scaffolding principle and establishing conditions for dialogue. Tape record one or two class discussions and then listen to the recording at home; it would even be worthwhile to transcribe 10 to 15 minutes so that you can study whether students are becoming actively engaged in the discussion. Remember, there is no one right sequence in these dialogues.

Here is a brief list of questions to ask about your discussions.

- Is the problem or goal explicitly stated?
- Do I focus students' attention on relevant aspects of the process that we are engaged in by describing and identifying them—am I thinking aloud as I talk?
- Do I use "who, what, when, where, and how" questions, and reflective questions to guide students' thinking?
- Do I elaborate and expand what students say, and suggest alternative viewpoints or strategies?
- Do I encourage students to take on more of my turns in constructing the discussion, letting them elaborate on an answer, and, *especially*, giving students opportunity and responsibility for asking questions?
- Do I provide an explicit statement of what we have discussed, making clear the principle, meaning, or logical relationship as part of the evaluation of the dialogue?

  Example: **"This morning we have found out that writing is a way of learning how we think; I especially liked what Gordon said about understanding his own feelings better *after* he'd written them down."**

  Not: **"You all contributed very nicely to our discussion."**

As a result of the self-assessment suggested above, you may already have decided on some changes in your dialogues with students during whole-group or small-group discussions. These last two sections describe two additional options for increasing the amount of interaction, small-task groups, and dialogue writing.

Small-task groups for cooperative learning

Small-task groups are optimal for creating more opportunities for students to interact effectively. Teachers are already familiar with the value of peer groups for developing social skills; the following examples stress ways of grouping students and structuring tasks so that cognitive development through dialogue is enhanced.

Each group should have students at differing levels of cognitive development who are asked to work cooperatively to solve a common problem, such as getting enough information to figure out how to make something work. Research has shown that in heterogeneous peer groups, the more cognitively advanced students *continue* to progress in their thinking as a result of working with *less* advanced peers (Perret-Clermont, 1980; Slavin, 1980). The reason seems to be that both less and more cognitively advanced students benefit from the presence of cognitive conflict, and both progress as a result of the need to elaborate their ideas, offer reasons for why things happen, or explain how they would solve a problem. Thus, teachers need not be concerned that heterogeneous small groups will hold back more advanced students, *as long as* there is a task requiring social cooperation and coordination and integration of different prespectives to achieve the goal.

By asking students to work cooperatively, and by setting up a task to which each must contribute knowledge to accomplish it, interactive mental processing is required to integrate different ideas. Also, interactional scaffolding by the teacher may be much easier to accomplish with smaller groups.

1. ***Paired learning tasks***

Primary-age students are learning about weights (or any other scientific concept). A simple game can be devised in which children must work together in pairs with a balance scale to solve the problem of finding the right combination of weights from among blocks of different weights of the same size. Each child has the same set of six blocks of different weights (Cooper, Ayers-Lopez, and Marquis, 1982).

The children are to work together, with each child responsible for one side of the balance. The task is self-evaluating: Students will know when they are right. This game allows students to discuss what will work and to find the right combination. Any similar task in which two partners must contribute equally to the outcome and must discuss possible solutions will do as well.

If material or equipment is limited for this kind of group task, a learning center can be set up, and children can work there in pairs while other activities are going on. A very important extension of this task is to ask

a member of a pair who knows how to play it to teach another child who does not know.

2. *Jigsaw*

Jigsaw is a cooperative learning process for students from kindergarten through graduate school (Aronson, 1978). Students are assigned to small heterogeneous teams, and the task to be learned and materials are divided into as many sections as there are members on each team. For example, a biography might be broken into "early years," "schooling," "first accomplishments," and so on. A study of plants might be divided into "food sources," "chemical manufacturing," etc. A study of a country might be segmented into geography, culture, industry, transportation, and government.

First, members of the different teams who have the same section form "expert" groups and study together. Each then returns to his or her team and teaches the section to the others. Jigsaw requires that students depend on and learn from each other.

Additional Resources: Student Grouping

Aronson, E. *The Jigsaw Classroom*. Beverly Hills, Calif.: Sage Publications, 1978.

3. *Peer review/editing groups*

Small-task groups are especially helpful in writing. The group's task is to discuss aspects of the writing assignment before writing and then to critique in a helpful way first (and second and third) drafts. These peer review groups are a way to have students take on the responsibility for determining the purpose of the writing task, and then apply this purpose as the goal of a particular assignment. For example, if a class is learning to write persuasive letters to spur someone to take action, the groups can discuss before writing what evidence is needed, how specific to be, or how to organize an argument. After a draft has been written by each member, the group's task is to read and make helpful suggestions as an audience before a second draft is written.

Additional Resources: Peer Review and Editing

Hawkins, Thom. *Group Inquiry Techniques for Teaching Writing*. Urbana, Ill.: National Council of Teachers of English/ERIC, 1976.

Holbrook, Hilary Taylor. "Johnny Could Write When He Was a Kid." *Language Arts* (October 1981): 864-866.

Moffett, James. *A Student-Centered Language Arts Curriculum*. Boston: Houghton-Mifflin, 1973.

Dialogue journals and dialogue writing

For many years, writing has been idealized as a way of developing "thinking." And when we read a clear, coherent piece of writing, we say it is evidence of a "good mind." Recently, teachers have begun to find better ways to make writing for students a real "tool of thought," an active process for creating and transforming and practicing reflective, conscious thought. Keeping a dialogue journal is one way to engage students in actively thinking about their learning and personal experience. Other kinds of dialogue writing can occur in letter correspondence or focused journal writing in content areas such as math, history, or composition.

Dialogue journals are private, written conversations between students and the teacher on a daily, semiweekly, or sometimes weekly basis (Staton, 1980; Staton, Shuy and Kreeft, 1982). (Journal writing works best if it is done often with brief entries.) As discussed earlier, a number of examples demonstrate that students are free to write about whatever concerns or topics that *they* feel are most important. The writing is *functional*; that is, students and teachers write directly to each other, using language to get things done in an active way. Students ask questions, complain about lessons, describe what happened on the playground or at home, reflect on why things happen, express personal feelings, and even argue with the teacher about the fairness of assignments—in other words, they think in written language.

The teacher writes a direct, personal response to the *content* of the student's writing, rather than commenting on its form or style, and also brings up new topics of interest. In responding, the teacher may describe what happened in a disputed event from another perspective, explain in more detail the reasoning behind an assignment or decision, and ask reflective questions that require the student to engage in some rethinking. The teacher's responses are natural elaborations and extensions of the students' thinking about issues and experiences.

The journals also give students an opportunity for reflective, deliberate rereading of what they wrote earlier. Because of the informal conversational style with a question-answer format, a student must often reread his or her own entry to understand the teacher's response.

"You Can Just Look It Up In Your Mind." Students who have kept a dialogue journal not only like the opportunity to share their thinking with the teacher, but quickly understand that this is writing *to* think. One student explained the difference between dialogue journals and other writing:

> "Well, reports is, you have to look up facts and everything. But in journals you can just look it up in your mind, and write what you think" (Nicky, Spring Interview, 1981, in Mrs. Reed's classroom).

Another student said that she liked writing in the dialogue journal much better than completing worksheets on a content area.

"The worksheets make you answer questions, but dialogue journal makes *me* ask the questions, and then the teacher helps me think about possible answers."

Teachers are using dialogue journals at all age levels—often their use has grown out of asking students to keep a personal journal in which the teacher at first made brief comments. When the student responds in turn to the teacher's comment, a dialogue is begun. However, dialogue writing in whatever form is quite different from ordinary teacher-student discussions, in which the teacher is *evaluating* how well the student wrote but is not interested in or contributing to the topic itself.

Leslee Reed, the Los Angeles teacher whose use of dialogue journals has been most intensively studied, says that she began using dialogue journals as a way to *learn* more about what her students were thinking. After using them daily for 17 years, she still says:

> Oh, I'm learning, I'm learning, I'm learning! Especially with this class I have now, with so many cultures, there's such richness. I don't think I've ever grown so much in my life as I have this year in understanding the problems of different cultures, trying to fit into this pattern of American life. Plus, as a teacher who has taught for a great many years, I'm sometimes so sure when I'm teaching a lesson what the effect will be, that it does me good to see in the journals something that I totally missed. I have used a cliche or an idiom that literally blocked out everything I taught up to that point. It's like a challenge.
>
> I find that journal writing is sort of the kernel of my teaching. When I sit down to do journals, I am doing a kind of resume of my day, and of each child. As I'm writing each child I'm mentally thinking about that child. As I'm reading each journal I'm seeing if what I sensed as a teacher came through to that student. And often it comes through then in my lesson plans, that this did not go over well. I'll need to get this over from a different point of view. So it becomes a planning tool, a core from which I'm planning not only tomorrow's work but next week's work, too. For me, it makes my whole school year flow, because I have a constant finger on the pulse of the children. I know quite accurately what every child is doing and not doing.
>
> Like everyone else, I get exhausted from teaching, but when I sit down to do my journals I get exhilarated. Sometimes their advice to me is hilarious, you know, telling me what I should do. This feedback is so good for me and I really do look forward to it. I can be just dog tired and sort of go "well, I've got to get to my journals," but the first thing you know, I'm so involved in my journals that I'm no longer weary (Reed, 1982).

Pages 36 and 37 show two examples of student-teacher exchanges, one from the second grade and one from the sixth.

Strategies for getting started. Dialogue journals allow students to write anything about whatever topics that they wish without worrying about what others think of what they write, or *how* they write it. Only the content of their thinking matters, not the forms, spelling, or paragraphing, for example. When you start these journals, say simply that they are a way to *communicate*, to talk with you. Following are key aspects in implementing effective dialogue journal communication.

First, there are the *logistics* of keeping a dialogue journal. Here is the way most teachers have found that it works best.

- Small, bound journals (not spiral notebooks) with covers that can be individually decorated are most appropriate. Students are impressed when they fill up a whole book and get a new one.

- In elementary school classes, journal writing should be allowed to occur at free times or transition times all during the day, rather than at one assigned time. Elementary school students need to be able to write as soon as questions, ideas, or problems pop into their heads; they usually forget what they really felt and wanted to say if they have to wait until a set time.

- It is important to establish a regular place and time for journals to be turned in, and handed back: They should not be "collected" like other papers. A corner of a room or a "journal bag" can be used.

- Teachers should write back immediately; short, brief exchanges seem to work better, and are easier. Most teachers take the journals home each night and spend about an hour responding, which also doubles as relaxation and "thinking about tomorrow" time.

- The journals should be given back to students first thing in the morning, and they need enough time to read your response and write in return.

For younger students, it may be helpful to set a minimum length for any entry—such as three sentences—so that no one can complain about having to write "too much" when there just isn't anything to say. This keeps the dialogue going over dry spells.

At secondary levels, teachers will probably need to modify the approach, and some in-class time will be needed for journal writing. High school teachers have found that once or twice a week turnaround is practical and still allows

Second-grade Dialogue Journal

Wendsay April 1 1981

Student: Dear miss stulbe I Want to go to times but I dont no how to do it from Angel

Teacher: What are you talking about? Where do you want to go? What is it you don't know how to do?

Thursday April 2

Student: Dear miss Stulbe I was taking About timer math I don; no how to do it

Teacher: Oh. Now I understand. Of course you don't know how to do times, but I will show you before summer comes!

March 3 1981 oops

the ball monster and I'm only a cute little ball monster. Math was fun today. every day so far we've been going over the math text.

Most of the time Jalen is bugging people and stuff like that. And it is very anoying. (Sorry I keep complaining to you but sometimes I get so mad I feel like telling someone about it). That's why writing in journals are good.

I hope I get no 7s on my spelling test.

Oct. 16 M

5-6

I don't like the way we do our reports. We just write a few words about a subject that they have. I like writing a full report better. today

In math it was fun. We went through our math book (it was our first day using the books).

My spelling paper is all full so I put it in my file.

Are you going to answer ... writing ... Mon, Oct. 15

Yes, I certainly can see how very annoyed you would feel! Jalon blames you for his problem. Should you and I get together with Jalon and make a plan so he won't be blaming you?

It is good to complain - if we don't share our concerns, we just keep feeling bad about them. This way I am aware and can help (I hope!)

When we are through gather-

for sustained, thoughtful conversations to develop. It is also "OK" to suggest a maximum length for older students' entries, and to stress that they are writing directly *to* you, not just filling pages with thoughts.

Just as important as the logistics are your responses. They will help students to "dig deeper" into themselves and to express more of their ideas, opinions, feelings, and values. Some tips for responding:

- Respond to their topics first, acknowledging the importance of what they are writing about and commenting on their topics before you introduce a new or related topic of your own.

- Ask genuine questions, ones *you* do not have the answers to either, but would like *their* ideas and personal opinions on. Be careful not to ask two or three questions consecutively—that is teacher talk!

- Make your response interesting by talking about how *you* feel, what your opinions and concerns are. As you develop greater rapport with individual students, you can share your personal experiences and fears just as you would with a close, trusted friend.

- Write about as much as the student writes, not more. This is very important to equalize the power between you, as an experienced writer, and a beginning writer, as we saw in the example from Eduardo's journal.

- In your response, draw the student out. Ask questions which can help the other writer elaborate and add to a topic he or she has introduced. (This means avoiding yes/no questions such as, "Did you like today?" But: "Why do you think that problem happened?")

- Use a direct, informal style of writing—write down what you would say if you were responding orally, including phrases and exclamations.

- Try to answer the student's questions as completely and honestly as you can. But if you do not know the answer, or wish not to answer, say so. You can set boundaries for the discussion; so can each student.

- Try not to lecture or give advice. Instead, offer ideas and choices and ask them in turn what *they* think. Some students will try to make you a "Dear Abby," and demand that you solve their problems. Remember that your job is to help *them* think it through, not to have all the answers.

- Be patient and try not to do it all in one turn—you'll get more chances and so will they.

Focused dialogue writing in the content areas. How do you get students to really think about math, history, the writing process, or learning a foreign language? How can students develop metacognitive, conscious strategies for directing their own learning? As students move beyond primary grades, teachers need to be concerned with helping them become independent, self-directed learners. And independent learning requires that students think for themselves, in new situations, learn to ask questions, and have strategies for consciously transferring and applying their knowledge. Dialogue writing provides a way for students to reflect consciously with their teacher or instructor about the processes and difficulties of learning and the general principles and concepts which are at the heart of the particular subject matter. (See also Thaiss, 1983, in this series.)

Dialogue writing on a regular basis can occur about the learning process and assignments in almost any area. In the first part of this booklet, an extended dialogue about science illustrates one way of using dialogue writing to encourage students to reflect on their learning. In the booklet's third section, the dialogue on math involves discussions about the content of mathematics.

Essay-dialogues

A student's first draft of an essay or story can become the basis for an extended dialogue in writing between the student and teacher concerning possible elaborations and revisions. Many teachers *do* write back with good comments on student essays—sometimes called "response" writing or evaluation. But a dialogue approach developed by Wilmington, Calif., teachers allows students to respond in turn and extends their reflective thinking about the content of their writing and approach to presenting it.

In the following example, an eighth-grade student wrote a first draft (typed), discussing a story the class had read. The teacher then asked questions to elicit more elaboration, and the student's responses led to further comments by the teacher.

The Pigman

Well, John's parents are people who like to have things their own way of at least his father is that way. In the story John called his dad Bore. When John told Bore that he wanted to be an actor his father told him he was stupid. Instead of listening to John he told him he should grow up to be a business man. His father is very pushy. But on the other hand his mother is just the opposite. She is very clean and doesn't like the house getting dirty. She also gets hyper when John and his father are having the slightes discussion.

Lorraine only has a mother. Her mother is very supious about boys. She's a nurse and is always complaining about her job. She's always telling Lorrane about her appearance and how hard it is to bring up a child by herself.

No, I don't think I could handle having parents like that. They seem to expect too much out of you. It really doesn't seem like they care. They have too many family problems. It doesn't seem like they even want to settle any family problems. They don't listen to each other. They neglect there children, except for Lorraine's mother who is over protective.

Teacher:* Very accurate account of their problems! (A) Let me pose a very difficult question and see if you can answer it: WHY?

1 Why do you think J's dad thinks acting is stupid?
2 Why do you think his mother is "hyper" and cleans all the time?
3 Why do you think L's mother is always criticizing her appearence?
4 Why do you think L's mother is suspicious of men?

Student: 1. Maybe when his father was young he wanted to be an actor. Maybe he just didn't have the potentials to be an actor. He saw he could not be an actor so he decide that acting was stupid.

Good point. John does say his parents were afraid of his imagination. Maybe they were right in some way.*

2. She's probly just afraid of Johns father. He throws a fit if it doesn't go right for him at work.

Very possibly true! She's afraid of something for sure!*

Vague!*

3. She probably doesnt want the boys to be tempted by her daughter. In the story she asked her daughter if she thought her skirt wasnt a little to low. So I think that she doesnt what anything to happen to her daughter.

maybe we can be given more specific and say L's mother doesn't want anything to happen to L. that happened to her?*

4. She doesnt trust men because of what happened to her. Her husband left her. She put her trust in him thats why.

*Teacher comments in script.

Essay-dialogues retain the notion of *functional* interactive writing-as-thinking and, as these examples show, use students' first drafts as points of departure for reflection and discussion by both student and teacher. Many teachers find that students devalue their own writing and do not really take time to think about what they write on the teacher's comments. Engaging the student in a "thinking" dialogue *in* writing is one way for a teacher to demonstrate the value of the student's thoughts as the basis for the teacher's own comments. Secondary school teachers in the Wilmington, Calif., school district who came up with this adaptation report that the average time required for students to submit revised essays dropped from a month to less than 2 weeks when dialogues were used as a means of feedback instead of corrections on spelling and grammar.

Additional Resources: Written Dialogues

Dialogue Journals: A Commonsense Approach to Communication, a handbook on dialogue journal writing (by Leslee Reed and Jana Staton), is in preparation and will be available in 1983 from the Center for Applied Linguistics, Washington, D.C. 20007.

Thaiss, Christopher. *Learning Better Learning More: In the Home and Across the Curriculum*. Washington, D.C.: Basic Skills Improvement Program, U.S. Department of Education, 1983.

A NOTE ON BEGINNING

This booklet is only a point of departure for your own creativity and ingenuity in strengthening the kinds of language interaction which are already occurring in your classroom. Our interactional perspective has looked at a student's use of language not as a product to be judged or measured, but as part of an ongoing cognitive process. We want you to understand the cognitive demands on the student of being involved in dialogue and the resulting growth in thinking processes and strategies. So rather than being concerned with forms of language, we have stressed the *cognitive* functions of language interaction and invited teachers to reexamine their own interactions with students, and their students' interactions with each other. Those of us who have studied what teachers and students actually do in interaction are convinced that this is the heart of the learning process, and that there is a lot more going on there than you might realize. We are not suggesting that you do something entirely different or new, but we hope that you have become more aware of the value of what you already do, and of the essential role that you play in students' development when you demonstrate what it means to "really think" about something in such a way that students can participate actively with you in the process.

The teacher who gets genuinely perplexed by an event and begins to think about it together with a student or a group of students, becomes part of the student's "internal dialogue," as Bruner suggests. By sharing a dialogue in written or oral language, the teacher's thinking can become part of the student's own thought.

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