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Scaffolding: A Powerful Tool in Social Constructivist Classrooms

by

Laura R. Roehler

Michigan State University

and

Danise J. Cantlon

Holt Public Schools

After a year of having opportunities to scaffold one another's learning, a teacher asked the whole class why they liked helping each other.

Kurt: I like to work with other people because it helps me learn to cooperate.

Kalli: We get to share ideas together. We learn new things from others and we can give ideas too.

Maurie: I agree. Its fun helping out other kids. People help me because I help them.

Linda: When I work with others, they help me understand.

This group of elementary school students valued the opportunity that scaffolding provided for their learning. Why is scaffolding a valuable tool for teaching and learning? What is the role of scaffolding during learning conversations? How do children learn to have authentic learning conversations with one another?   What are the important components of a social constructivist classroom?

To answer these questions, this chapter will provide background information on the connectedness of social constructivism, scaffolding, and learning conversations within the context of the literacy cycle. Following this, the methods and results are presented. The two guiding questions which examine the role of scaffolding are
(a) What types of scaffolding occurred during learning conversations? and (b)   What were the

characteristics of scaffolding within a classroom setting?   The conclusions will summarize and expand the findings regarding these two questions.

Background

Teachers and educators are realizing that future adults need to be self-reliant, adaptive, life-long learners who collaboratively can reason through problem framing and problem solving situations. These adults need to be able to think and act in ways that signal they value themselves and others, know how to be responsible for themselves and others, and are respectful of themselves and others.

Productive effective youth of today and adults of tomorrow are different from the productive effective youth and adults of yesterday. Until recently, educating the youth primarily has involved the transmission of knowledge. We believed there was a knowledge base and the teachers' responsibility was to give that knowledge to those who were learning. This meant the development of well organized, clearly composed information that rested in this set knowledge base. Literate ability was conceptualized as a stable collection of hierarchical skills to be mastered. Drawing on the educational paradigm reflected in the views of behaviorism (e.g., Skinner, 1957) and information processing (e.g., LaBerge & Samuels, 1974; Gough, 1972), teachers' drill provided practice of isolated skills that led to mastery. The goal was to decode text and get meaning. The teachers' job was to provide students with rules and skills to obtain that goal. Lecture and recitation were the common formats of instruction. However, this way of thinking about teaching and learning has changed to where students actively construct their own knowledge and
understandings. They do this by making connections, building mental schemata and developing new concepts from previous understandings. Instead of learning a set knowledge base, students develop evolving knowledge bases through interactions with others.

Helping students develop evolving knowledge bases through interactions is best achieved by using the social constructivist model (Gavelek, 1986; Smagorinski, 1995; Vygotsky, 1978; and Wertsch, McName, McLare & Budwig, 1980). The social constructivist model assumes all knowledge is social in nature. Learning occurs in a context of social interactions leading to understanding. Learners are active risk takers who accept challenges and understand how and why to learn. They are given opportunities to restructure information in ways that make sense to them. Learners connect with their previously known information. They generate questions and comments as information becomes internalized. Learners first experience active problem-solving activities with others, but gradually they become independent problem solvers. Initially, the teacher or more knowledgeable person controls and guides the learners' activities. Eventually, the teacher and learners share the responsibilities with the learners taking the lead. The teacher continues to guide the learners' emerging understandings, providing assistance as needed. Finally, the teacher gives the learner the full range of responsibilities by removing all assistance. This progression from someone else being responsible for the learning to the student being responsible for themselves is an appropriate way to create an effective sequence of learning. This internalization process begins on a social plane and moves to an inner plane where information becomes part of each individual's evolving knowledge base.

Within the social constructivist perspective, the area in which an individual's optimum learning can occur is called the zone of proximal development. (ZPD). ZPD is defined by Wertsch (1985) as "the distance between the child's actual developmental level as determined by independent problem solving and the higher level of potential development as determined through problem solving under adult guidance and in collaboration with more capable peers" (pp. 67-68). Thus, learning is the development of higher level psychological processes occurring first on an interpersonal level through social interaction and later internalized. Within any given classroom, the ZPD is determined by the learners' levels of development and the forms of instruction. In all cases, instruction must proceed developmentally so that the learners are completing tasks that they would be unable to do without assistance. Each person's range of potential for learning is shaped by the social environment in which it takes place.

Assistance in the ZPD is called scaffolding and is a major component of teaching activity (see Bruner, 1984). Scaffolding characterizes the social interaction that occurs among students and teachers that precedes internalization of the knowledge, skills and dispositions deemed valuable and useful for the learners. It is an instructional tool that reduces learning ambiguity, thereby increasing growth opportunities (Doyle, 1986). Scaffolding is described by Wood, Bruner, and Ross (1976) as "...controlling those elements of the task that are initially beyond the learners capability thus permitting him to concentrate upon and complete only those elements that are within his range of competence" (p 9). As the teacher or more knowledgeable person creates a supporting structure that can initiate and sustain interest, the students become involved. As the students gradually gain control of the task, they take over more of the responsibility. When the assumption of responsibility and control occurs, the teacher removes the scaffolding.

Successful scaffolded instruction requires establishing intersubjectivity (Rommetveit, 1974) or shared understanding of the task. Teachers are responsible for leading the learners toward this understanding and helping them develop their own conception of the task. This is done by creating a balance of support and challenge. Support is provided through scaffolding and challenge is provided through learner interest in completing the task. Learners are given opportunities to act like they know how to complete a task before they actually do. Scaffolding and challenge need to be presented holistically and in a context that signals value and usefulness. This allows the integrity of the task to be maintained throughout the teaching and learning opportunities. Teachers and learners co-construct understandings about the task enabling shared understanding to develop.

Scaffolding developed to assist students internalize information best occurs in learning situations where the learners have opportunities to communicate their thoughts. Conversations provide such opportunities. Jane Roland Martin (1985) states that "A good conversation is neither a fight nor a contest. Circular in form, cooperative in manner and constructive in intent, it is an interchange of ideas by those who see themselves not as adversaries but as human beings come together to talk and listen and learn from one another" (p 10). Conversation is a dialogic process by which we create and negotiate knowledge with one another. It is the primary means for solving higher order problems and developing thinking strategies in those with less expertise especially within the areas of reading (Duffy, Roehler, and Rackliffe, 1986; Pearson, 1985); writing (DiPardo & Freedman, 1988); mathematics (Lampert, 1990); and science (Palinscar, Anderson, and David, 1993).

A particular type of conversation called instructional conversations has been researched by Gallimore and Tharp (1990) in collaboration with Goldenberg (1991). They define instructional conversations as discussion-based lessons geared toward creating opportunities for students' conceptual and linguistic development. The teachers focus on concepts that are relevant for students and of some educational value. Background information on a topic is activated, teachers build on the students' ideas, and then guide the students to new levels of understanding. The teacher's responsibility is the facilitation of oral and written discourse in meaningful and/or useful ways. Instructional conversations act as metascripts (Gallimore & Tharp, 1983) in that a format is used that provides a structure for the discussions. This enhances learning.

Roehler and associates have further refined the concept of conversations from instructional conversations to learning conversations (Roehler, Hallenback, McLellan, & Svoboda, in press). Learning conversations are similar to instructional conversations but go one step further. In both types of conversations, teachers focus on concepts that are relevant for students and have educational value. Background information on a topic is activated while teachers build on the students' ideas and guide the students to new levels of understanding. However, in learning conversations teachers not only teach, they learn. They co-construct information with the students and gain new knowledge. They join conversations where all ideas, comments, and questions are important. All participants value and respect their own ideas and the ideas of others. They also feel responsible for their own learning and learning of others (Roehler, McLellan and Svoboda, 1993). Learning for both students and teachers is the primary outcome.

Learning conversations became the means for explaining scaffolding in two classrooms where the social constructivist approach was implemented and maintained. The zones of proximal development for the two sets of students were used to consciously shape the learning opportunities through scaffolding as thematic units of instruction unfolded.

This study became the means to explore the role of scaffolding in two social constructivist classrooms. The first question examined the types of scaffolding that occurred in learning conversations within language units. The second question explored the characteristics of scaffolding within a contextualized setting.

Methods
Participants

The participants are teachers and students from two classrooms in two school districts during a three year study (The teachers involved in this study include Danise Cantlon and Pamela Seales in the multi-age classroom and Meredith McLellan, Laura Roehler, and Nancy Svoboda in the ESL classroom). Both classrooms were selected because a social constructivist approach to teaching and learning was evident. Scaffolding for the study occurred during language instruction. The first classroom was located in a suburban school district just outside a midwestern city. It was a multi-age classroom which consisted of fifty third/fourth/fifth graders and two teachers. The student population was diverse especially regarding the socioeconomic range with 23% of the students receiving free and/or reduced lunch. Ethnically, only 5% of the student body was classified as minorities. About 70% of the students have been in the multi-age

room for at least two years. One classroom teacher has been teaching for nineteen years and the second classroom teacher has been teaching for six years. Both teach mathematics and social studies. One teacher instructs all language literacy lessons and the other teaches all the science lessons.

The second classroom in the study was also located in a suburban school district just outside a midwestern city. It is an English as Second Language (ESL) classroom where students came to from Korea, People's Republic of China, Taiwan, Estonia, India, Malaysia, the Czech Republic and Russia. They were all first year English language learners ranging from the third through fifth grade. The upper level classes were selected because the students' oral English expertise was proficient enough for conversations to occur. Most of the students received reduced or free lunches. The teachers are two ESL teachers and one university professor. One ESL teacher has been teaching for 22 years and the second ESL teacher has been teaching for 21 years. The university professor has been involved in classroom instruction for 26 years. The ESL teachers were responsible for the instruction of ESL students one hour at a time, five times a week. The university professor joined the ESL teachers for one class period three or four times a week.

Setting

The multi-age classroom was located in two classrooms which were connected through an opening in the wall in a K-S school. The learning environment of this classroom was collaborative in nature, providing continuous opportunities for social interaction among all learners. Throughout the day, students and teachers had time to create questions and research topics, create and solve problems,   learn content, and share ideas as they constructed meaning. Verbal interactions between students created opportunities for them to have a vested interest in one another's learning. The students saw their ideas, explanations, and teaching as valuable and useful to the learning of their classmates. Respect and responsibility were essential components to the learning community. Scaffolding was provided and reduced as students internalized dispositions about themselves as learners, the reasoning process, and the new content knowledge.

The ESL classroom is located in a K-5 public school set within a married housing unit of a major university. The students were children of undergraduate and graduate students attending the university. Many spoke little or no English when they first arrived from over forty different countries. While a few were from single parent families, many were children of first generation college students. A number of international students' families were sponsored by their home governments. The learning environment of the ESL classroom functioned around learning conversations which provided continuous interactions among teachers and learners. Throughout the hour class period, students and teachers had time to frame and solve problems, generate questions and comments about the contents of the lessons, gain understandings and share ideas. The teachers created opportunities for students to value and respect each other's learning by providing for co-constructed verbal interactions. Students saw their ideas, thoughts and feelings as valuable to all participants. Scaffolding was provided and reduced as students gained control and became responsible for learning valuable and useful knowledge, skills and dispositions.

A Description of the Teaching and Learning Experience

The teaching and learning experiences in both classroom were designed to focus on learning conversations within the literacy cycle (Duffy & Roehler, 1993). The literacy cycle provided many opportunities to talk, read and write in structured settings. Conversations played a major role within this cycle, as expertise in reading and writing grew. Since it is known that knowledge generally is acquired in social situations, and since students already talked to family members, friends, and acquaintances on an ongoing, comfortable basis, the structure of using learning conversations was used.

The literacy cycle was initiated with guided reading and writing. During this time, teachers created opportunities to read, write and then talk, about student- and teacher-selected topics using a book club format (Raphael, Goatley, McMahon, & Woodman, 1995). Reading and writing activities included formats such as books, journals, poems, magazines and newspaper articles. Videos and CD-ROMs were watched and discussed. Learning conversations were combined with these literary events. These literacy events and conversations led to the creation of rough drafts including stories, articles, poems, and books that were written both individually and in groups. Specific, explicit, and adaptive instruction in reading and writing occurred within learning conversations as needed.

If students wanted to share their beginning ideas and seek additional ideas or had difficulty in creating rough drafts, they joined a group at a sharing area where students and/or teachers met to discuss the emerging rough drafts. Reading and writing activities and learning conversations occurred at this time. Students returned to the sharing area to revise as needed. Eventually, students took their latest drafts to an editing area where the collaborative teaching team and/or the students provided assessment of content, mechanics and form. Once again, reading, writing and conversations occurred. After written products were assessed, the final drafts were shared at the author's chair within learning conversations and the literacy cycle began again. Ongoing, authentic reading, writing and learning conversations occurred continuously throughout the literacy cycle.

In both classrooms, teachers collaboratively created and implemented literacy lessons within integrated thematic units, using the structure of the literacy cycle. The students were expected to be constructively responsive participants who could co-construct knowledge within oral and written discourse. The classrooms involved much sharing, interaction, valuing, respecting of self and others, and development of responsibility for self and others. All participants had equal status with varying degrees of expertise about school related issues.

Data Collection and Analysis

Data were collected over three years in the two classrooms through student interviews, teacher journal excerpts, audiotaped lessons, field notes of literacy lessons, and transcripts of literacy lessons. Student interviews were completed for each marking period. Teacher journals were kept daily. Literacy lessons were taped within month-long units and subsequently transcribed. Field notes were taken on mostly a daily basis.

In addressing the two research questions, qualitative methods were used. The constant comparative method (Glaser, 1978; Glaser & Strauss, 1967) was selected. One university professor, two graduate students and two teachers analyzed the data. The major analysis consisted of a three stage process using primarily the transcribed lessons. The field notes, teacher journals and student journals provided ways to cross check and revise hypotheses arising from lesson transcripts. This process of triangulation (Gorden, 1980) strengthened the hypotheses. During the first stage, lesson transcripts were read and reread to capture the events and the flow of conversations. The beginnings and endings of learning conversations were noted and conversations were labeled. Field notes were used to verify the learning conversations.

During the second stage, the contents of learning conversations were analyzed for examples of scaffolding and a description of contextualized scaffolding. This process led to categories of scaffolding that were being used and possible descriptions of contextualized scaffolding. These contextualized characteristics and types of scaffolding were shared with other coders to seek agreement and create definitions. The process of coding, seeking, and creating characteristics and examples then continued. During the third stage, the examples of scaffolding were grouped and the description of contextualized scaffolding were noted. As new descriptions of the contextualized were modified scaffolding and new types of scaffolding were found, re-coding of previously coded contextualized characteristics and examples of scaffolding occurred.

Results

The results of the analysis are reported in terms of the two research questions. In both classrooms, scaffolding was embedded in learning conversations that reflected the social constructivist model.

Types of Scaffolding

The first research question examined the types of scaffolding that occurred within the two classrooms. Lesson transcripts from the ESL classroom were used to answer this question. The analysis yielded five different types of scaffolding designed to assist students gain conceptual understandings. These five types occurred as students were learning in their zones of proximal development. This learning began with information sharing where the raw material for constructing understanding was communicated, and then moved to mediated learning where the learners gradually took responsibility and control of their learning (Roehler and Duffy, 1991).

Offering explanations. The first type of scaffolding was explanations. Explanations are explicit statements adjusted to fit the learners' emerging understandings about what is being learned (declarative or prepositional knowledge), why and when it will be used (conditional or situational knowledge), and how it is used (procedural knowledge) (Duffy, Roehler, Meloth & Vavrus, 1986; Paris, Lipson & Wixson, 1983).

An example of explanations occurred in the ESL classroom in a unit on animals and their behavior. Teacher A began a class period with an explanation about the responsibilities of the author and the listeners during author's chair where students read their writings to others. These

responsibilities had been discussed earlier but the teachers had assessed that learning had not yet occurred. Teacher A prompted the students to recall what was to be learn about being listeners. She then asked them to remember how the listener acts. The students replied that listeners should look at the people who are talking, be polite, don't talk and don't raise your hand when somebody is talking. The teacher and the students provided information about what listeners were and how they behaved. The generated responsibilities were listed by Teacher B. Teacher A continued by providing an explanation about why it was important for listeners to help authors feel comfortable when reading in the author's chair.

Teacher A: All of those things make the person giving the report feel more comfortable, doesn't it? Because if you're giving your report and people are showing you in ways that they can that they're interested and that they like your report, then that makes you more comfortable, doesn't it? And, you can say, "Oh, this is fun. I like sharing this because other people are signaling to me they'd like to hear it."

Throughout the remainder of the lesson, the teachers gradually removed explanations about what listeners do, how they do it and why that behavior was important.

Inviting student participation. The second type of scaffolding was inviting student participation. In this type of scaffolding, learners were given opportunities to join in the process that was occurring. After the teacher provided illustrations of some of the thinking, feelings or doing that was needed to complete the task, the learners had opportunities to fill in the pieces that they knew and understood. In the following lesson excerpt, this type of scaffolding occurred.

Teacher B continued the lesson by helping the students learn how to be a good author. She invited them to participate by offering behaviors about how to carry out the responsibilities of the author during author's chair.

Teacher A: Maybe we should now have us think about how to behave as the author during author's chair. What do authors do? Who can remember? Would you like to start?

Tina: The author sits in the author's chair and speaks loud and clear.

Crystal: The author should not fool around like making faces or having outside conversations.

Shina: The author should not be shy and should be brave and confident.

Teachers continued to invite students to participate in the subsequent lessons, as this type of scaffolding, inviting participation, was removed. A list responsibilities was created and used in subsequent lessons.

Verifying and clarifying student understandings. In the third type of scaffolding, teachers

checked the students' emerging understandings. If the emerging understandings were reasonable, the responses were verified. If the emerging understandings were not reasonable, the teacher offers clarification. This type of scaffolding, verifying and clarifying student understandings, was also found in excerpts from the animal behavior unit. Conversations continued around author's chair.

Teacher A acknowledged the good efforts of the students and asked all participants if the list of author's responsibilities made sense. When she verified they understood, she asked the students to generate the listeners' responsibilities in the same way. After the list had been generated, she asked the students to make decisions about another responsibilities list created earlier in the year. They were to note any listener responsibilities on the earlier list that had not been listed this time.

Teacher A: Now, are there any in the earlier list that we don't have on our current list? Yes, Shina.

Shina: The audience may try to show that they enjoyed what the authors said.

Teacher A: We hadn't talked about that. That's important isn't it? To show that we enjoyed it. What else was new? Crystal.

Crystal: I think that the audience should be ready...ready to ask questions or offer or have comments when the author stops sharing.

Teacher B: That was one that we just barely thought about, but that's really important, isn't it? It may be one of the most important things about the audience's responsibility that you need to think about. Like, "Oh, I like this part because it reminds me of such and such or I wonder what this means? Or, I wonder what would happen if all those types of things would happen." It is really fun to share those types of questions and comments. Now does this make sense? OK, Tina, did you have your hand up earlier?

Tina: The audience should be thinking of a comment or question for the author?

Teacher A: That's a good one too. Sometimes that is hard to do, isn't it? To think and listen at the same time. Okay?

Tina: How do you do that?

Teacher A: Sometimes people have a piece of paper to jot it down. That's OK too. If you feel like you want to have a piece of paper, then we can do that. Any others? So, do you think we are ready for author's chair?

In this lesson transcript, students shared their understandings and the teachers verified those understandings. Effort was acknowledged and the knowledge was signaled as important and useful. When confusion was indicated, the teacher provided information.

<u>Modeling of Desired Behaviors</u>. The fourth type of scaffolding was modeling. Modeling was defined as a teaching behavior that showed how one should feel, think or act within a given situation (Duffy, Roehler & Herrmann, 1988). It included think-aloud modeling where the learners were shown an illustration of how to feel or think as they progressed through a task. A school activity in which participants were deciding what is important in a book chapter and where a teacher thinks aloud during a lesson about the reasoning that is used was an example of think-aloud modeling. Modeling also included talk-alouds where the learners were shown how to act by the designated teacher talking about the task as it is completed. A school activity where a teacher talked about picture clues in a story but did not talk about the *reasoning* that is needed to understand the story was an example of talk-aloud modeling. Finally, performance modeling was where the learners were shown how to complete the task with no think-alouds or talk-alouds about the performance or the progress toward doing the complete performance. The school activity where the teacher reads silently as the students read silently (USSR-uninterrupted sustained silent reading or DEAR-drop everything and read) were examples of performance modeling. In this type of modeling, the teacher physically demonstrated reading and the enjoyment of the reading material by laughing, smiling, etc. (See Roehler and Duffy, 1991 for a more detailed explanation of the types of modeling.)

The first type of modeling is making thinking visible. This type is an example of the think-aloud modeling. In this process, participants think through their emerging understanding of the process out loud as attempts were made to solve the problem or issue. In this form of scaffolding, teachers modeled think-alouds about how to do a process. and learners were encouraged to do the same. This process is difficult and usually occurred after a number of students have contributed clues.

In the following lesson excerpt, the group was talking about creating weather myths. A teacher thought aloud about the mythical reasons for volcanoes and prepared the students for the next learning event.

Teacher B: That's the end of that one. You know what I was wondering? What caused that volcano to bubble like that? Can you think of a reason why? It would have to be something inside of the volcano, wouldn't it? What caused the lava to get hot and bubble over like that? What is the reason for the inside of the volcano to be hot? To be heated up. Let's think, if we could imagine anything that we wanted. Could we say that the volcano was a cooking pot for somebody and there was a big fire underneath there? What do you think? Any other ideas? What would be causing that volcano? Maybe, we could be thinking about that when we watch the next piece of video tape?

Later in the lesson, a student made her thinking visible when thinking aloud about how night occurs.

Sari: I have one for night.

Teacher B: OK

Sari: The...um...a giant girl, she has...she has...She likes black so she wears it and she has long, long black hair.

Tina: A black lady?

Sari: No, a girl, she like black.

Teacher A: A girl, she likes black. A girl that likes black.

Sari: Have long hair.

Teacher A: Has long black hair, right?

Sari: Yeah. And when she runs, her hair goes like that, and then...it flows. And its night.

In this last excerpt, Sari was able to think aloud her reason for the occurrence of night a girl with long dark flowing hair causes it.

The second type of modeling found in the analysis was the modeling of question and comment generation. This is an example of talk-aloud modeling.

The lesson is a continuation of the unit on animal behavior using the authors' chair format. Different students read reports, one at a time while all others listened. All participants tried to enact the responsibilities of authors and listeners. Listeners were especially encouraged to generate comments and ask questions during each reading. The first sharing was a report on elephants. After the report was shared, the teachers modeled the think aloud strategy of generating questions and making comments. In the following excerpt, Teacher B modeled a comment.

Teacher B: I think it was interesting when you talked about the baby elephant--that they were three feet high when they were born. And, they weighed...

Tina: Two hundred

Teacher B: Two to three hundred pounds. These are very big babies. And, also, I was interested in the hair. When babies are born, they have hair covering their bodies. I didn't realize that. I was also amazed they can walk in an hour.

Teacher B supported the student's efforts and was specific in her comments about the report.

Teachers also modeled questions about the elephants. Teacher A asked a question about types of elephants.

Teacher A: I was wondering if you... know which kinds of elephants those are in the picture. Are those Indian elephants or African ones?

After this question had been discussed, Teacher B followed this conversation with the modeling of another question.

Teacher B: I was wondering what a land animal is? In your report, you had that an elephant is a land animal.

This led to an extended conversation about land animals and examples of land animals. During this conversation, a student said that elephants can pick up everything with their trunks. Teacher A then modeled an elaborated comment about the muscles in elephants' trunks.

Teacher A: That's what I was thinking of with all those muscles. Their trunks can go up over their heads. They can also go straight out and then they can curl all the way down and back. So, they really have tremendous flexibility.

Tina: Shina.

Shina: We have the hand. Maybe they use the trunk for carrying something, like our hands.

Teacher B: That's right. Like we use the hands, they use their trunks.

The student emulated the teacher's elaborated comment and connected the information to knowledge that she already had.

After extended conversations based on participants' comments and questions about Tina's report on elephants, Teacher B modeled supportive feedback about the process of generating questions and comments during author's chair.

Teacher B: It amazes me when we have our reports and we share them. I feel we could start writing all over again on the same subject. Because, as we're discussing the elephant and the more we talk about it together, the more questions and comments that come to mind. This happens regularly. We really get to talk and learn all about our reports.

A second report on elephants was read in author's chair. The author then opened the conversation for questions and comments. The students began the comments and questions so teacher modeling was not needed.

Crystal: Yes.

Selon: Your report was good and what... what was the question in the beginning?

Crystal: In the beginning, how do elephants feel when people ride or sit on them?

Selon: Not this one, the first one.

Crystal: OK. How do elephants' mothers take care of them...or the little babies?

At this time, the students' comment were not elaborated and the questions were not opportunities to connect content information, so Teacher A modeled a connecting content question with an elaborated comment.

Teacher B: I was wondering when you said that the mother elephant has the baby elephant inside her for twenty or twenty-two months. Does it stay in there that long because it has to have more time? It's so big when it is born.

Crystal: I don't know. But I think that ...yes it might be that because...

Teacher B: That's a long time.

Crystal: Yes.

Tina: Human beings have just nine months.

Selon: Yeah, so I think it's longer.

Teacher B: You said twenty or twenty-two...that would be more than a year.

Tina: Double!

Teacher B: Just a little less than two years. Wow!

Crystal: Almost two years that she carry her baby. Yes.

Tina: I think the baby elephant has..have to stay in her mother's body for that long, because it has to grow..grow long.

Crystal: Maybe.

Selon: In Tina's report (an earlier report) she said that...uh...it can walk after an hour. Maybe it's that way because it stays so long in the mother's...body.

Teacher A: Good thinking!

Teacher B: I hadn't thought of putting those two things together.

A teacher opened this learning conversation with a modeling of a question and a comment that connected content. Tina and Selon offered elaborated comments that signaled they had made

connections in their knowledge with Selon, showing that she had made connections from two different sources. Teachers continued to model elaborated comments and questions that helped the students to offer their own comments and questions. Scaffolding decreased as learning occurred.

A third report on Pandas was read in author's chair. Shina read her report. Student questions and comments followed.

Shina: The panda is kind of big animal. The name panda came from the mountain country of Nepal. Panda look like bears and pandas are black and white. Pandas have colorful teeth. When we touch them they are soft. Pandas are not dangerous animals. Panda have poor eyesight. Black and white pandas really have sharp teeth, too. Pandas have the larger teeth than other.. .any other animal. The first panda lived about a million years age. Panda live in China always. Panda's moms take care of the baby by holding the baby... by holding the panda or baby in the mother's arms and holding the baby all the time whenever she goes. Pandas sleep 12 to 15 hours a day. Pandas eat grasses and roots and leaves. But their favorite food is leaves. This report talks about the descriptions and behaviors of pandas. I write about how they live, where they live, what they eat, what they like and how they take care of their babies.

Student-generated questions and comments followed.

Selon: What did you say their favorite food was?

Shina: leaves.

Shina: Crystal?

Crystal: OK. I have three questions. What country to they...was living?

Shina: Nepal.

Crystal: They living.. always in what country?

Shina: China.

Crystal: China? OK.

Tina: No, where did they come from?

Shina: Oh, the name? The name of the place? They come from the mountainous country of Nepal.

Tina: Where is it?

Teacher A: That's a good question.

Selon: Probably China.

Crystal: And, where Panda live?

Shina: China.

Crystal: China. OK. And does the baby eat...where...he first, he looks or he eats already leaves? I mean, some type of animals, they..first eat mother's milk, and then eat leaves.

Shina: First, they eat...um...the mother's milk and they eat , they grow and they eat leaves.

Selon: I like the way... how you described that. You put it in order.

Shina: Uh, Crystal?

Crystal: I really like your report and you covered a lot of information about panda.

Shina: Thank you.

The students were responsible for this entire conversation using elaborated comments and questions that provided opportunities for ongoing knowledge connections. Teacher A verified the value of a question only once. The students continued to be responsible for the content of the learning conversations as Shina made a comment about her report.

Shina: When I go to library...um...I took a panda book. I read yesterday and they tell when the panda eats. And, they say the panda always eat in the night.

Crystal: Yeah, they do. They do eat at night.

Tina: Why is that?

Shina: Maybe that's...that's the time when every...animal go in their houses.

Selon: I think I know.

Crystal: Maybe they eat like, maybe before they can sleep.. with something inside.

Shina: I don't know. Maybe they have no breakfast, lunch and dinner.

Selon: I think I know why they eat at night. Because then nobody could see them resting and eating and everything. So, like people can't kill them more at night so they just go out and eat at night.

Shina: Crystal.

Crystal: I think they're hiding because maybe people, so many people, they kill them. And so, they hiding in the day somewhere so all day he.. .she have to carry her baby. Then, at night, when everybody sleeps, they know that peoples are sleeping. They can go and eat outside and do anything that they want. Have change from days.

Shina: I have a question about eyesight. I'm not really sure what that means.

During earlier lesson segments, the teachers modeled connective questions and elaborated comments. The students gradually took control and eventually, the learning conversations were led by the students' comments and questions.

Inviting Students to Contribute Clues. The fifth type of scaffolding was one where several students contributed clues for reasoning through the issue or problem. In this form of scaffolding, learners were encouraged to offer clues about how to complete the task. Together, the teachers and students verbalized the process.

An earlier conversation about mythical reasons for weather events continued with the teachers showing how to contribute ideas. One teacher invited participation with a second teacher contributing a clue. The first teacher then connected the clue.

Teacher B: Is air a natural event?

Teacher C: Good question. It just happens out there, doesn't it? Have any thoughts on why it would have to come out? Be creative, have fun.

Teacher B: Stretch.

Teacher C: OK. So the inside of the earth is stretching. So, it stretches so far that it pushes out. The earth is stretching. I like that. Any other ideas about why that stuff bubbles out of the mountain?

This lesson continued as students and teachers brainstormed weather events. In the lesson on the next day, students began to take the responsibilities for contributing clues. In this segment, the participants continued a learning conversation about the mythical reasons for the weather events of a blizzard.

Tina: What's causing a blizzard?

Sari: You know...um...the king of North Pole, the king of North Pole came here and got mad because. ..um...

Teacher A: Came here where it's warm.

Teacher C: Came here where it's warm, got mad. So?

Tina: Cause he likes cold.

Teacher C: So he...

Teacher A: And so, what did he do to make the blizzard?

Selon: He cried.

Shina: ...his tears turn into snow and the wind...

Teacher A: He cried very hard, right? And, his tears turned into?

Shina: Snow.

Teacher C: Snow. And, his?

Selon: Maybe his tears turn into sleet?

Teacher C: Uh huh. There you go!

Teacher C: OK. I have the king of the North Pole came here where it's warm and he?

Sari: Was mad.

Teacher C: Was mad. And cried hard.

Teacher A: Yes, very hard.

Selon: Cried very hard.

Sari: And ...um...his tears turned to sleet and snow and...um...his...

Teacher C: His breath turned into wind?

Students: Yeah.

Later in the lesson, the students took most of the responsibility for contributing clues. They were talking about reasons for snow.

Sari: Just tell a little bit of your idea.

Shina: Um...snowflakes...um...stars are making good.

Teacher B: Why are they falling to the ground?

Shina: Maybe, because they drop.

Teacher B: They dropped what? They dropped their cookies? OK.

Crystal: How come snowflakes is always the same? Like they all have six sides.

Shina: I don't know.

Teacher A: Can you imagine?

Shina: cause...um...the stars...maybe, the stars want to pattern six point things but they only have five. So, ... cookies with six sides are dropped.

Teacher A: Cookies with six sides...That's very good. You are being creative.

Sari: Maybe the stars want to have five...six point like that but they only have five so they make their cookies six.

Sari: Maybe the stars want to have five...six point like that but they only have five so they make their cookies six.

Later still in the lesson, the students took full responsibility for contributing clues.

Tina: I got one. The eclipse is the sun and moon kissing.

Selon: What?

Tina: The sun and the moon is kissing.
(laughter)

Selon: Don't write that down.

Crystal: It should be bumping into each other.

Teacher C: Oh, I have to finish writing (on large paper) . You want me to write kissing?

Selon: Just write the k-word.

Teacher C: Well, we can change it?

Students: Yeah.

Students: No.

Selon: Wait, I know one. I know what it should be... it could be bumping into each other.

Crystal: Yeah, I think that's right.

Tina: Oh yeah, bumping.

Teacher C: Do you want to change it to bumping?

Students: Yeah.

In summary, five types of scaffolding occurred. The teachers offered explanations, invited student participation, verified and clarified student understandings, modeled making thinking visible and the generation of questions and comments and invited student participation. These types of scaffolding were reduced as the students gained responsibility of their learning. Eventually, the students were in control signaling that they had internalized ways to contribute to the conversations.

Description of a Scaffolded Learning Opportunity

The second question looked at a learning opportunity where contextualized scaffolding occurred. As types of scaffolding occurred within contextualized events, they were noted. In the multi-age classroom, a unit on tall tales was implemented. The comparison thinking strategy was introduced at the beginning of the unit. On the first day, *Annie Christmas* taken from Cut from the Same Cloth was read to the whole group. A conversation about the literary elements, the tall tale genre, including exaggerations, and affective responses occurred. The types of scaffolding included explanations and inviting student participation. On the following day, *Bess Call*, also taken from Cut from the Same Cloth was read. Before the reading occurred, comparisons were discussed. One of the teachers explained the comparison strategy using an example of cats and dogs. The teacher used think-aloud modeling about how the two animals were alike and invited student participation as she made a list on the dryboard. Then she modeled as she thought out loud about how cats and dogs are different by reading a list. The students were helped to understand how comparisons are made by examining two familiar things to see how they are similar and/or different. After providing another example of making comparisons, students were again invited to participate. At the end of the learning opportunity, the class generated a definition, "A comparison tells how things are the same or different." The students then contributed clues about comparisons. Alissa gave the first clue about comparisons. She said, "Comparisons are important because they make you think harder about the book."   Sean followed with his cue, "You have to understand what is happening in both books to make a comparison so you learn more." Claire said, "You use them by finding something in a book that is similar to another book. Or you can also tell how things are not the same. Or you can do both." Kathy contributed, "I think you should tell both how they are alike and different. That way you learn more about the two books." Dean concluded, "First you read a tall tale, then you read another one. How you make your comparison is to think how they are the same or not. It's like making a connection between books you read. So anyways, it helps you understand more because you have to think about two things."

During this learning conversation, teachers provided explanations and modeling about why comparisons were used and how to make them. The goal was for all of the students to understand the meaning of a comparison, why it is an important strategy, and how to use it. The

students were invited to join the process by creating a comparison definition. They then contributed clues as they applied this strategy while having conversations about the two tall tales.

After reading *Bess Call*, the remaining whole group time was spent with students giving examples of comparisons between *Annie Christmas* and *Bess Call*. In that conversation, Jack, Caitlin, and Peter used thinking out loud after the teachers had modeled it.

Jack contributed, "Both tall tales were about women who helped people take care of bullies." Caitlin contributed, "They were both about strong women, who got what they wanted. The two tall tales were different because Annie whipped twelve men at once but Bess only wrestled one man." Peter concluded, "Annie was a hero because she saved the people's lives on the boat during the storm. Bess wasn't a hero because she didn't save any body's life." After the whole group conversations, the students moved into book clubs where they read, wrote, and talked about creating their own tall tales.

The next day, during whole group conversations, a venn diagram was created using the two tall tales. The teacher first provided an explanation that a venn diagram was a visual tool for making comparisons. Then, she modeled talk-alouds using a venn diagram showing the cat and dog comparison. The teacher talked about how the space under the cat label was exclusively for cat characteristics, the space under the dog label was exclusively for dog characteristics, and the space where they overlapped was for both cat and dog characteristics. She noted that the venn diagram can be helpful because in a glance, you can see how two things are alike (the overlap) or different (the separate space). After the explanation and modeling, the tall tale, *John Henry* was compared to *Annie Christmas* using the venn diagram. The students were invited to participate in a whole group conversation about this activity as a venn diagram was created. The following statements are students' contributions. Robert said, "John Henry was a railroad person but Annie wasn't. So put that idea under the separate part just about John Henry." Scott added, "You could put that Annie was a boatworker, alone in her spot. Hannah said, "Annie was a black person so write it in her circle." Sarah concluded, "I know something they both were. They both were black people. You can put that where the circles overlap in the middle. They both are black so it would go in the overlap not just in Annie's section."

During this discussion, students made their thinking visible as they placed information in the venn diagrams and explained their reasoning. The students also verified their understanding during the oral exchange. Sarah helped clarify why Hannah's idea belonged in the overlap space.

After whole group conversations, the students picked a partner and created their own venn diagram using two different tall tales they had read during Book Clubs. Their learning was often scaffolded by another student, and sometimes a teacher. This scaffolding included contributing clues, making thinking visible, and verifying and clarifying each others ideas as they explained the placement of the information on the venn diagram, and brainstormed ideas about the tall tale comparisons, and asking questions and making comments of each other to clarify ideas.

Over the next month, written and oral responses during Book Club focused on comparisons where students responded thoughtfully. Partners wrote comparisons about a tall tale and their own life. Conversations during Book Club provided opportunities for students to monitor their

understandings about comparisons and to push other student's thinking about making more complete responses. One Book Club conversation illustrates how one student contributed clues to assist a peer. Ryan said, "I am making a comparison to my own life and Pecos Bill. Pecos Bill is about a cowboy, who lives with the wolves. He rides a cyclone. He marries SlueFoot Sue." Demi asked, "So what is the comparison? That sounds like a summary. You forgot to tell how you are like or different from Pecos Bill." Demi monitored Ryan's understanding, challenged his thinking and then contributed clues which enabled Ryan to better understand comparisons. His written response in his book club log reflected that he had enhanced his understandings about comparisons.

Another excerpt of a Book Club conversation follows. A teacher joined a group to model how to generate questions and make comments after she observed that the Book Club members were just reading their written responses with no listeners actively participating. She wanted them to have an authentic conversation instead of merely reporting from their written responses.

Teacher: When I was listening to Maggie's responses, I was thinking about some questions and comments. J was wondering, why did Johnny Appleseed want to help people by planting apple seeds? I also had a comment for Maggie. I really like the way you made a connection between our tall tale unit and our historical fiction unit. You talked about our focus on the interaction between Native American Indians and settlers. Just like we learned that sometimes these two groups of people got along peacefully. Maggie is telling us about that idea in her tall tale book.

The students followed the teacher's modeling by generating their own questions and comments that verified and clarified each other's understanding.

Jeff: Maggie, you did a nice job summarizing because you told some interesting details.

Maggie: Thanks.

Maria: Was Johnny Appleseed the only tall tale about a real person? This tall tale didn't have as many exaggerations.

Maggie: I'm not really sure. I think. . . John Henry was real.

Zack: I think a lot of tall tales were based on real people. But ... then, they added a lot of lies.

Maria: You mean exaggerations? Lies are different. They're mean. Exaggerations are for fun.

The Book Club group members gradually took responsibility for the learning conversations. They started asking questions and making comments to each other. The developed understandings by making their thinking visible and talking aloud, verifying and clarifying understandings and contributing clues as their learning conversation evolved.

The final activity was for each student to write a comparison paper about Pecos Bill, based on the movie video and the written tall tale. A planning sheet for comparisons was explained and

modeled. The teacher talked aloud how to use a planning sheet explaining that it was a way to organize thoughts on comparisons. The teacher used a planning sheet as she explained the procedure.

After watching the video, the students were invited to participate by contributing their clues about comparison in writing. For example, Denny's completed planning sheet showed reasonable comparisons between the movie and the book. For the first question about the two things being compared, he wrote, "the movie of pacos (Pecos) bill (Bill)" and "the story of pacos (Pecos) bill (Bill)". For the second question about how they are like, he wrote, "in both they lassod (lassoed) a tornado", "Slewfoot Sue rode a big catfish" and "the horse ate dynamite." For the third question about how they are different, he wrote, "In the book they were dying of bourdom (boredom).", "In the book bill (Bill) has a rope as long as the equater (equator)." "And in the movie he dident (didn't), thats different," and "bill (Bill) got kiked (kicked) out of texas." Denny made his thinking visible when he completed his comparison paper. One teacher verified the accuracy of his contributions.

The following day, the students used their planning sheets to write rough drafts. Students met with their peer editors to ask questions and make comments about their partner's comparison paper. Teachers provided some scaffolding by modeling and explaining comparisons for students who were still attempting to make sense of comparisons. They again invited these students to participate by making their thinking visible in order to verify or clarify. They were asked to contribute clues about comparisons. As the students carried on learning conversations, the teachers verified or clarified the students emerging understandings. As the students' understandings of comparisons grew, the teachers' understandings of their students' understandings grew. The teachers reduced the scaffolding as students learned.

It should be noted that scaffolding was initiated and dropped at different times for different students. Learning did not occur uniformly with all the students. In the tall tale and comparison unit, the students showed that they were at varying points on the continuum toward the internalizing the information as knowledge. After the comparison strategy was introduced and students had opportunities to use the strategy, some had grown to the point where they could apply the strategy as they read tall tales. Others could not and continued to need scaffolding. The teachers had to vary the scaffolding to best meet the needs of all students. Few of the students were at the same point at the same time in gaining responsibility and control of using the comparison strategy. The same variation occurred during the development of understandings about tall tales. Some students internalized the content knowledge
about tall tales while others struggled. Varying degrees of scaffolding remained for some students while others operated on their own.

Conclusions

The students and teachers in these two classrooms created knowledge using strategic reasoning as desirable dispositions supported that learning. This learning occurred in opportunities that

reflected the social constructivist model. As students explored questions and concerns of their own making, they felt responsible and in control of learning. Five types of scaffolding were found. Explanations and modeling were provided as needed. Students were invited to participate. As students made their thinking visible and generated questions and comments, their emerging understandings were verified and clarified. Gradual reduction of the scaffolding assisted students as they internalized the new content knowledge, the reasoning processes and dispositions of helping self and others, valuing self and others, and respecting self and others. The reduction of scaffolding occurred in a context which had to be taken into account when the data was analyzed.

The teachers in these two classrooms created contextualized learning opportunities that illustrated powerful learning principles. The first principle was the balance   of challenge and support. The challenge was the learning of knowledge, strategies, and dispositions through activities that were of high interest for the students and included choice. These challenges created the intellectual unrest or the curiosity needed for learning. Support was the assistance that the teachers provided during learning opportunities. This support was twofold. One type was permanent and the other was temporary.

One type of permanent support was the use of the literacy cycle. It provided structured consistency allowing the students to focus their cognitive energy on the learning of the new knowledge, skills and dispositions embedded in the teaching learning situations.   Another type of permanent support was the learning conversations which acted as a form of metascripts (Gallimore & Tharpe, 1983). This support assisted teachers as they met the needs of their students.

Yet another type of permanent support was the teachers' modeling of manner. Manner consists of the dispositions and character traits of a person (Fenstermacher, 1991). Manner is shaped by habituation, learning opportunities, and reasoning about intentions and actions. Manner was developed in these students by teachers providing opportunities for the formation of habits about ways of thinking and doing and showing the students how to do it. Students responded in specific ways and were engaged in thinking about their actions and reflecting about them. The teachers in these two classrooms reflected the manner that Fenstermaker refers to as an effective and responsible teacher. They promoted a respect for evidence, a sense of tentativeness and willingness to suspend decisions while exploration proceeded. Their thinking and actions showed an appreciation of and regard for inquiry and an openness to alternative and competing ideas. They reflected a valuing of self and others, a respect of self and others and being responsible for self and others.

Temporary support which was gradually removed included the five types of scaffolding. Students learned when information was explained and modeled using think-alouds and talk-alouds. They also learned when they were invited to participate with the knowledge they possessed no matter how rich or sparse. Students internalized information as their emerging understandings were verified and clarified. Finally, they contributed clues. The teachers helped students learn within their zones of proximal development.

The second learning principal was the need to embrace the complexity of the instructional

situation. Scaffolding was not simple addition or a simple process. It was very complex in that students were at varying places in learning. The teachers had to provide varying amounts of scaffolding for some students as they struggled to internalize a new concept, strategy, or disposition. Simultaneously, other students were applying that same new knowledge on their own.

Finally, the study illustrated the important principle of question and comment generation. Sternberg (1994) states that children are natural question askers but they lose this strategy if adults don't respond to their questions and comments appropriately. Responding appropriately means allowing them to assume responsibility for their own learning with teachers providing explanations, clarifications and feedback. As their tentative questions and comments are expressed, the students need to understand eventually how to verify and clarify each others' thinking.

The teachers in this study used scaffolding to create opportunities for students to generate questions and comments. They also used the learning conversations as vehicles to respond to those same generated questions and answers. Questions and comments were made. Hypotheses were created and tried out. Challenging and supporting occurred. New information was sought, in oral and printed forms. Thoughts were clarified and expanded.   The teachers in this study agree with Sternberg (1994) who explained that the single most helpful thing a teacher can do to help children learn is to take their questions and comments seriously and turn those questions and comments into learning opportunities.

Scaffolding is an important instructional tool because it supports students' learning. It helps students to understand that they can teach and learn from others. This leads to collaboration which is an important life skill. Students who work together to frame and to solve problems have opportunities to experience this collaboration. Students need practice to actively construct knowledge, to make connections, and to build mental schemata. Learning in this type of socially constructed environment leads to students taking responsibility for their own learning and respecting their own and others' thinking. Learning conversations provide opportunities for students to verbalize their thoughts. When it comes to collaborative problem framing and solving situations, students whose learning is helped by scaffolding occurring in socially constructed environments will have an advantage over students who do not.

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Scaffolding and Participation in Classroom Interaction: Perspectives from English Immersion Teaching in the People's Republic of China. Dissertation Presented to the Faculty of Education ofThe. 169. University of Hong Kong in Partial Fulfillmentof the Requirementsfor the Degree ofDoctor of Philosophy.Pokfulam: The University of Hongkong Michell, M. & Sharpe, T. (2005). Collective instructional scaffolding in English asa Second Language.classrooms.ProspectVol. 20, No. 1 April 2016. Roehler, L. R. & Cantlon, D. J. (1996).Scaffolding: A Powerful Tool in Social Constructivist Classroom. Michigan:Michigan States University. Rubin, D. (1993) Diagnosis and Correction in Reading Instruction.
Social constructivists emphasize that the teaching-learning process works best in social settings in which individuals engage in discourse about a topic. Participants advance their own thinking through exposure to the views and insights of others. Communicating their own beliefs and understandings forces them to articulate their ideas more clearly, which sharpens their conceptions and frequently helps them make new connections. Challenges in Planning Constructivist Assessment One challenge for teachers using the social constructivist model is to ensure that students collaborate thoughtfully as