

In Support of Scientific Inquiry: Building Literacy Development in Kindergarten

by Denise Tarrats

A First Day Snapshot

“What’s that, under that sheet?” said O.B. He had been in our new kindergarten class for only about an hour. “What sheet?” I replied. He jumped up from his seat and ran across the room. “In there,” he pointed. I walked across the room and removed the cover. “Ah!” went the rest of the children as they jumped up to see. I tried to explain as I showed the class the tank. “It’s just an empty tank,” I said, “but soon it will be home to our new class pet.” “A pet...what kind? A rabbit, a snake, what?” It was not easy to contain O.B.’s enthusiasm or to explain that we would need to decide later, as a group, what kind of pet would be a good fit for our class.

Excitement, curiosity, questions, a desire to learn--these are the breath of kindergarten. They are what both challenge and invigorate my passion as an early childhood teacher. Listening to the questions and using them to initiate inquiry-- this is my role as teacher.

My role would be to provide O. B. and the rest of my 23 students with an environment that would permit this enthusiasm they brought to school to flourish. I believed that our kindergarten should enable my students to learn from firsthand experiences, utilizing all their senses. I would need to provide experiences, materials, structures, and time to allow growth.

As a teacher and learner, I was interested in exploring inquiry research on the kindergarten level because I could not recall research on the early emergent reading and writing level. Perhaps I just needed to revisit theory I had learned and forgotten. Or perhaps researchers and teachers both thought as I did that kindergarten teaching was based on inquiry, so no research was needed. After all, I always felt my kindergarten class was experiential and sensory-based so that it allowed growth. Wasn’t that inquiry? According to Pataray-Ching and Roberson (2002) in *Misconceptions about a Curriculum-as-Inquiry Framework*, “We experience our world through our senses which enable us to conceive meaning and to form new understandings. This form of meaning and understanding is more fully experienced when children inquire....”

My kindergarten class required students to talk, question, and experience the learning process using concrete materials. More importantly, I felt that I always listened to my students’ interests and planned investigations based on their interests. I knew that most students learned the skills they needed to be prepared for first grade because most left kindergarten reading, writing, and loving learning. Of course there were other factors that affected this outcome, such as class size, school attendance, parental involvement, and school curriculum.

Whenever I had the opportunity to educate myself about inquiry. I wanted that chance. The New York City Writing Project offered me the opportunity in the spring of 2008 to explore inquiry research as a teaching stance and to use this knowledge in my classroom. I knew it would educate me. I hoped it would improve my student’s literacy skills.

I struggled as a co-learner in this process. I often found it difficult to balance my desire to pursue our inquiry with the mandates of a schoolwide curriculum. I also knew that I needed “to possess theoretical understanding of inquiry in relation to curriculum and the learner” (Pataray-Ching & Roberson 2002).

Context

My school is located in the Bronx, New York within walking distance of the Bronx Zoo and the Botanical Gardens. In the first week of school I had 24 students. Our school neighborhood includes federally subsidized housing, new two-family homes and several shelter systems. One-third of my students were living in transient housing (shelters). They moved in and out of our classroom every month. Most students were five years old. They began the school year learning how to print their first names. Half were still learning letter names and sounds halfway into the school year. In the beginning of the year, they were a quiet group. At least half spoke another language other than English as their first language. Later, they all wanted to speak at once.

In an effort to create continuity, the school created a schoolwide curriculum. What this means for my classroom is that we must follow the reading and writing workshop calendar and use pre-planned lessons. We have literary genres to explore at specific times during the year. We have to submit writing samples demonstrating understanding of a genre every month.

I didn't realize how difficult this schedule would make it to conduct an inquiry project of interest to my class. However, it was not impossible.

Getting Started

We spent the first two weeks of school becoming acquainted with our class centers: Writing, Literacy, Computer, Art, Math, Drama, Carpeted Book Nooks, Manipulatives, and Discovery Zone. The Discovery Zone, a counter that stretched the width of the classroom, was where we kept our class pets and baskets of books on subjects related to our world--pets, plants, seasons, and so on. The Discovery Zone also included trays on which we put objects we wanted to investigate using such tools as magnifying glasses, microscopes, and scales. The children brought objects they found or things from home to put on the trays: I added objects as well.

One day in the fall, S.R. said, "I found this sticky ball on my way to school. I don't know what it is." I encouraged him to use our class resources to find the answer to his question. He found a picture reference book, *Backyard Explorer's Leaf Collecting Album*. He exclaimed, "I found it!" "What does it say?" I asked. He shrugged his shoulders. I read the page to him, "A sweetgum seed ball." With support, kindergarten students can research for themselves beyond their reading level. My role was to provide the resources, encourage him to look for information, and then read for him the words he was not yet able to read.

Observing Taily

After the first two weeks of school, the children were very excited by the newest addition to the Discovery Zone: a hamster. We observed the hamster for about a week. A rotation schedule allowed for visits to the Discovery Zone every morning as part of independent reading. Choice time later in the day could also include the Discovery Zone.

I asked the children to brainstorm attributes of the hamster so we could vote for a name. They suggested Furry, Brown, Fluffy, Pinky, Clawy, Hairy, and Taily. We graphed their suggestions. The majority chose Taily.

The children were constantly interrupting me with observations and questions about Taily, usually while I was working with another group. Many "read" the reference books about hamsters and wanted to borrow them to take home.

Then one day T.K. ran over to me and said something was wrong with Taily. I didn't notice anything wrong. So I asked her what she meant. She demonstrated that Taily had leaned his head back and opened his mouth so wide that she said, "I think he's broken." I realized then that perhaps we needed to know

more about hamsters. I confessed that although I had had many hamsters in the classroom, I really did not know that much about them. I did not know the answers to some of the children's questions. As a class, we decided to learn about hamsters, based on the children's real desire to know. Thus began our first year-long inquiry.

Asking Questions

I wrote some of our initial questions on a chart which we revisited whenever someone had an addition, answer, or amendment. Our first questions are accompanied by the initials of the children who asked them:

- Is it a boy or a girl? D.V.
- Why does it eat seeds or peanuts? J.G.
- Why does the hamster eat food? N.C.
- What is he doing to his hands when he does this? (demonstrates hamster rubbing paws together) J.M.
- Why does it eat apples? O.B.
- Why does it eat litter? I.R.
- Why does it drink water? Y.P.
- Why does he scratch himself? J.M.
- What is a question anyway? J.K.
- Why does he sit up like this? (demonstrates sitting on hind legs) T.K.

As the students and I reread their "wonderings," I asked them how they thought we would find the answers to their questions. They replied:

- We could use our brains to think. O.B.
- We could ask somebody who knows. My brother has hamsters. He knows everything. T.N.
- We could look at the hamster every day and then know the answer. S.R.
- We could look up the answer in the pet book basket. A.H.

No one suggested getting the answer from me! It made me feel good to know that my students were looking at me as a co-learner rather than as the teacher who knew all the answers. I told them that we would use their suggestions. We would put up a schedule to make sure that everyone went to the Discovery Zone and observed Taily every day. I told them that I thought that some of them already knew the answers to some of the questions. So we looked at our chart of questions and began to see if we knew possible answers.

Questions

1. Is it a boy or girl?
2. Why does it drink water?

Possible Answers

- All of the girls said Taily was a girl.
All of the boys said Taily was a boy.
I think he's thirsty after running around on that wheel thing.

The students recorded their findings in their class journals during writers workshop time and throughout the day. I added a Discovery Zone Share to our morning meeting share because many of my early emergent writers wanted to share more information than they were capable of writing down. One day J.S., a very quiet, frequently absent student, shared with the class that Taily had two big long yellow teeth.

Other students commented that the teeth were like those of a rabbit. I added that hamsters belonged to the rodent family of animals. My young researchers were beginning to classify information!

Observing the Questions

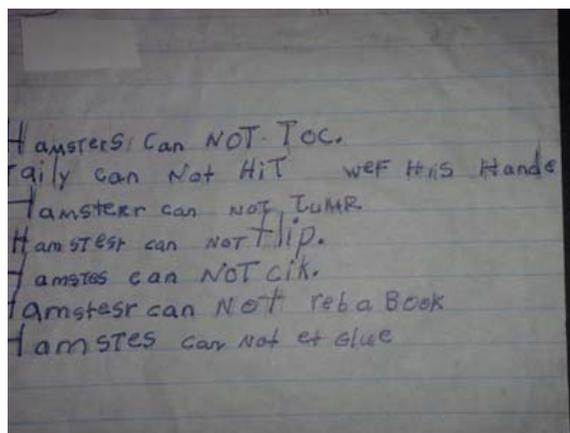
I frequently became frustrated that my students asked the same questions over and over. I thought they did not realize that the questions and their answers were already on the chart. However, I began to look closely at *who* was asking *what* question. As we listed the questions and added answers to the chart, I noticed that the children's questions could be categorized. They wanted to know what living things need and do. I was initially dismayed that their questions always seemed to be factual questions that required just one correct answer. I wanted them to begin to ask questions that were more thought-provoking. Over time, though, I began to realize that there were discreet layers of, and changes to, their questions that contributed to deepening understanding.

The children were actually grappling with the bigger concept of what it is to be alive. They were beginning to learn that all living things have similar needs and wants--food, water, shelter, air. They demonstrated this by answering others' questions. Someone asked again, "Why does Taily drink water?" A.H. answered, "Because everything that's alive has to drink water like us." Wow! The children were making connections.

This helped me understand why new students generated the same questions that had already been answered. Although this whole-class inquiry was being carried out as a group, each individual student was moving in his or her individual inquiry. For those students, it was of no importance that the others understood. Once they had one bit of knowledge they could question the next--and for them, it was a new question. They had not made connections with previous answers. They could not make connections until they were ready.

As students moved along this continuum of understanding, they made connections to themselves and others. O.B., who was skilled at vocalizing his questions in September, personalized his inquiry by seeing that the hamster might be capable of actions that O.B. might perform--or shouldn't perform. Other teachers were constantly giving O.B. time out because of his exuberance and unwillingness to give others a chance to talk. He did not want to work with others or do what they decided as a group. When O.B.'s writing group decided to write a book about hamster care, they tried to get him to write about the topic they chose, but he refused.

He decided to write a page for their hamster care book about what hamsters cannot do. His list of things Taily *could* not do sounded a lot like the things O.B. *should* not do.



Interestingly, when he rewrote his page for the book he changed some of his sentences. It seems that O.B.'s original writings reflected his feelings at the time about issues of anger and control with which he was attempting to cope.

Students new to our inquiry or those who were new language learners often began their wonderings with the same questions we had posted in September. They did not have the phonemic knowledge to use sounds or words to demonstrate what they saw or knew, but they could use other means. J.S., for example, showed a great deal of growth in the detail in his drawings of Taily.

Though J.S. had just mastered writing most of the letters in his name, his later drawings showed Taily's fur, claws, and rounded ears



Through his drawings, he could demonstrate what he had learned about hamsters although he had not yet mastered the letter name and sound systems and therefore could not write what he knew in sentences.

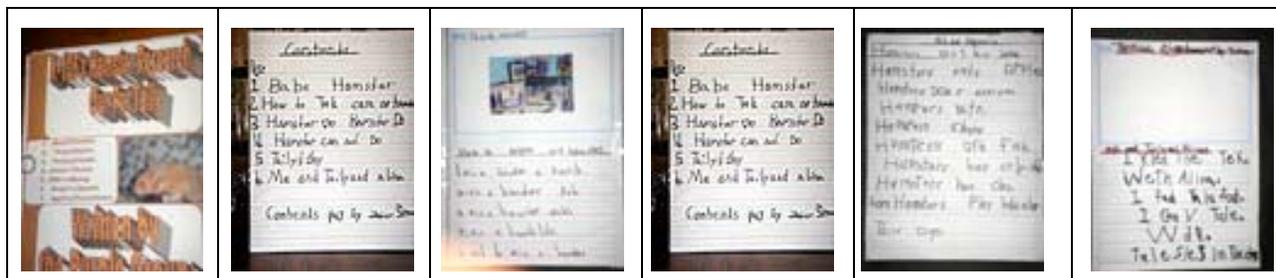
My plan was to observe the students as they visited Discovery Zone. However, I was never really able to confer consistently with the students while they were there. I felt I was missing something because the student's wonderings were always basically concrete, but then I realized that this reflected what they needed to know.

The children also had no prior experience with nonfiction books. One day S.R. came up to me and said, "I think that if you read a little bit about hamsters every day from the books we have, we'll know a lot about hamsters." I thanked him for the super suggestion and added observations we know about hamsters to our Discovery Zone share time. This addition helped me see the growth of knowledge of my students who were verbal but not yet able to use letters and sounds to express their written thoughts.

Bookmaking

Our investigation of living things did not end with our research about hamsters, although it did not continue the way I had planned. I had wanted to take my students beyond the classroom to visit local experts such as the pet store owner or to interview a veterinarian over the Internet. However, technical difficulties, time constraints, and my inexperience with the new school mandates prevented me from following through with these plans.

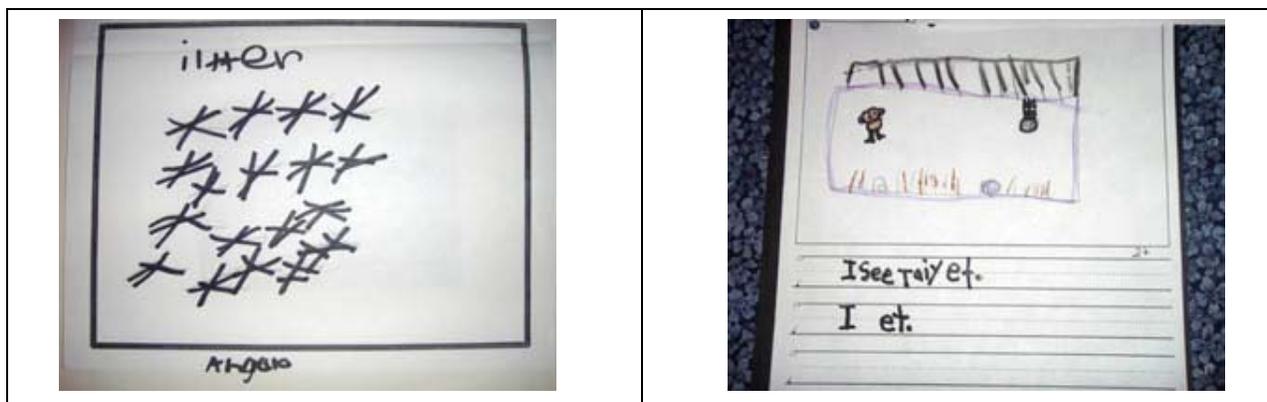
However, the children in the Purple guided reading group had their own plan. They wanted to write their own book about Taily. The Purple group consisted of beginning readers who knew at least 15 sight words and were able to read three or more sentences on a page. They could write their thoughts using their sight words and phonetic spelling. They demonstrated their knowledge by creating, *K-105's Hamster Research, Our Pet Taily*.



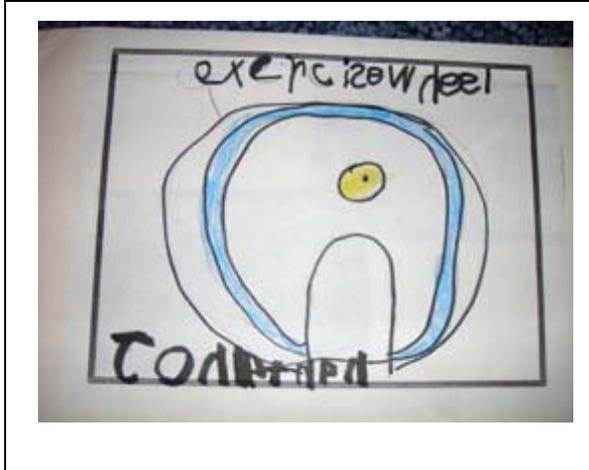
Each member of the reading group selected his or her own topic, created a title, wrote a page, and read it to the class.

I suggested that each guided reading group write its own nonfiction book about Taily. We had mini-lessons on features of nonfiction texts such as tables of contents, photographs, labels, diagrams, and more. Each group decided what their book would include. The Red group modeled their book after a nonfiction read-aloud book with a repetitive text structure called *Things We Need*. Their book, *Taily and Me*, used the structure *I _____, Taily _____s*.

A.M., who spoke no English in September, was a member of the Yellow group, but he also worked on the Red group's book because he wanted to write two different kinds of text.



A.M.'s Yellow Group, students who were still developing letter name and sound recognition, used class charts to label pictures but also wanted to make a photo "flip book." With the Orange group, they created *Taily's Hamster Tank*, which was composed of student illustrations with the photograph underneath the flip page.

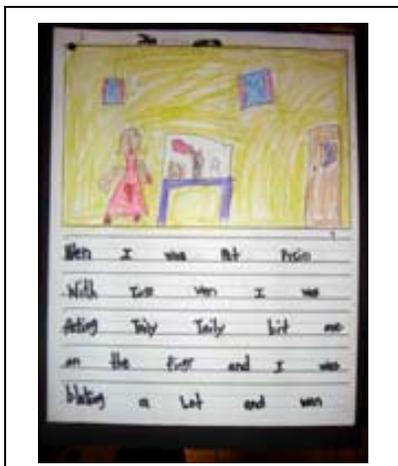


In this process, the students learned how to work cooperatively. They brainstormed ideas for titles, format, and content and then selected parts of a book to complete. They were able to agree and disagree--and still complete the task of producing a nonfiction text. They listened to their peers' observations and added information, correcting misunderstandings and creating new understandings.

In the spring, we continued our observations of living creatures at the Discovery Zone, adding caterpillar larva, ladybug larva, and garden snails. The students wrote daily about the life cycles of butterflies and ladybugs as they waited excitedly for the insects to emerge. Using the information they learned from the hamster inquiry about living things, they wondered about the new additions. They were able to use the nonfiction reference books, many of which were now on their reading level, to gather facts and spell words independently. Their vocabulary exploded!

Literacy Skill Growth

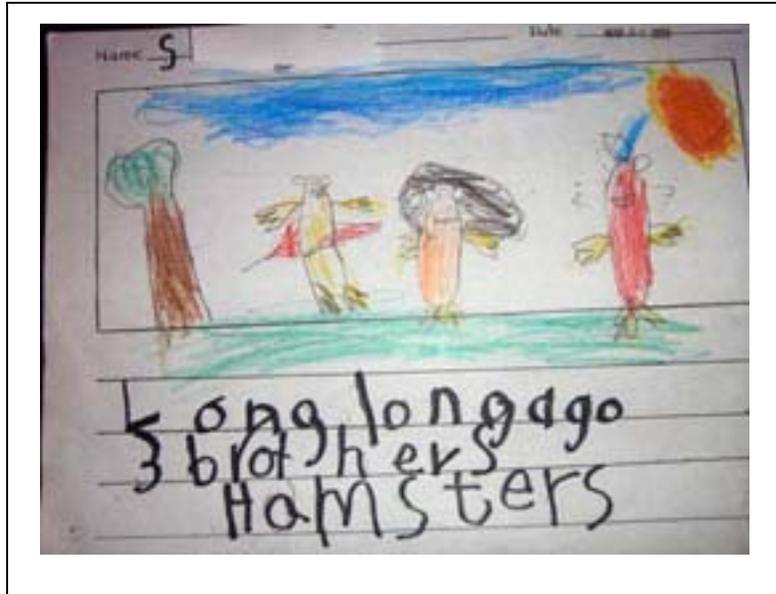
My kindergarten students' growth in literacy skills was evident in their ability to write about their experiences



Most learned letter names and sounds and felt confident in locating information in reference texts that were above their reading level. All the students--even those who, like A.M., didn't know letter names and sounds--wrote about their Discovery Zone experiences. The children chose to read nonfiction books as often as fiction. "Visual research"--reading photographs, illustrations, and diagrams when they could not

read the text--informed their writing. The drawings about Taily became more detailed with factual knowledge.

Literacy learning was part of our inquiry, as Taily appeared in much of the students' literacy work across the schoolwide curriculum. Some children wrote fairy tales about hamsters when we studied the fairy tale genre



poems about Taily in the poetry genre, and narratives about their time at the Discovery Zone



Using Facts

Conversations among the children included factual information they had learned. One of our earliest questions was whether Taily was a boy or a girl. The children refused to accept the factual information I read to them that led me to believe Taily must be male. Every child in the class called the hamster a boy or girl based on their own sex. Later, though, I overheard a girl say, “We know Taily is a boy. Yeah, I’m gonna say Taily’s a boy because look how big he is now. Look how long his hair got. Yeah, he’s real round like the boys in the book.” She was using factual information about male hamsters to confirm the sex of the hamster rather than relying on her personal preference.

Language Development

Perhaps the greatest growth in the class was evident in students’ language development and willingness to participate in discussions about the hamster. All students in the class participated. They felt confident about their details and wanted to share what they observed or knew. They spoke clearly and loudly. This was an enormous step for all the students, but particularly for the English language learners. A. M. spoke no English when he joined our class in September. By the end of the year, he became a confident speaker of English. Though he still struggled to learn the English letter and sound system, he could use reference charts and texts to write his understanding. A.M. is an example of how inquiry and the opportunity to learn based on one’s own curiosity and wonder give each learner the same opportunities.

Reference

Pataray-Ching, Jann, and Mary Roberson. (2002). “Misconceptions about a curriculum-as-inquiry framework.” *Language Arts* 79, 498–505.