Using Photographs To Support Children's Science Inquiry

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Using Photographs to Support Children's Science Inquiry

Cynthia Hoisington

As a Head Start teacher in a full-day, inclusive classroom, I often take photographs of the children in my class and use them in a variety of traditional ways. Recently, however, I discovered a new use for photography, as a powerful teaching tool to support science learning.

It all began when my class and I were invited to participate in the Education Development Center (EDC) science curriculum development project, Building Structures Exploration. My role as a development teacher in the project was to observe, support, and extend children's building play; assess what science-related questions they were asking themselves; and help children frame and organize their building experiences by supporting building-related discussion and representation.

To document what children were doing and to share what was happening in my classroom with other members of the curriculum development team, I decided to capture the action with a digital camera. I envisioned being able to use the photos as tools for both assessment and planning. Examining photographs of the children building structures would let me reflect on what the children knew and how they were using the construction materials. In turn, I could plan further activities and experiences, building on children's

interests and current knowledge (Helm, Beneke, & Steinheimer 1998).

I knew that photographs would also be useful in telling children's families and my colleagues the story of what we had learned during the building unit. I planned on collecting the photos I would take throughout the course of the unit, captioning them with children's descriptions of what they were doing, and arranging these photos and descriptions on poster board along with children's building-related drawings. I would add my own commentary to the structures display, focusing on how the children's explorations supported science, math, and literacy learning.

However, as the children and I became more and more immersed in the Building Structures Exploration project, several new, unplanned uses of photography emerged: to help children revisit and extend their investigations, to reflect on their building experiences and articulate the strategies employed, and to analyze and synthesize these building strategies. These uses turned out to be the most exciting ones of all.

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Photos courtesy of the author.

Photographs help children revisit and extend their investigations

From the very start the children were excited about building, but something was missing. Children would build one thing one day, something different the next; they didn't seem to be making any connections between their various building experiences.

One day I took a photograph of Christine next to several towers of cylindrical unit blocks she had made. As I looked at the photo later, I got the idea to use it as a basis for a class discussion. The next day during circle time I shared this photo with the whole group and invited Christine to tell us what she was doing in the picture. She responded, "Building with fat round blocks and skinny round blocks!"

block area and used it as a base. I watched as she quickly placed the blocks, one on top of another. I resisted the urge to give her advice about how to place them. When the new tower reached the same height as the tallest original one, I asked Christine if she wanted to try going higher. She seemed nervous but excited as she carefully placed an additional block, using both hands. "I notice you are placing that block very carefully," I said. "I don't want it to fall down!" she answered.
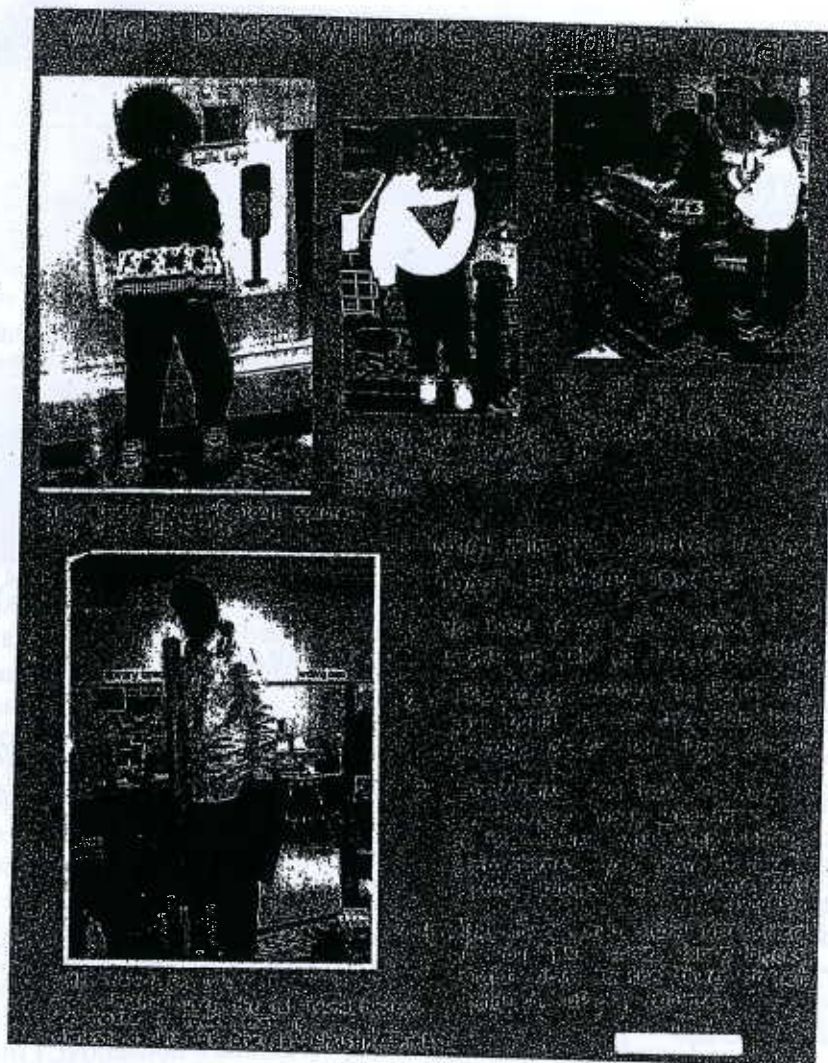
Our group discussion with the photo had clearly inspired her to continue the activity. In returning to the same type of building, she was able to confront the challenges of design, balance, and stability that she had encountered the day before, but this time she tried new strategies.

As the children became accustomed to having their building experiences photographed, they took a more

Together as a group we counted the number of blocks in each of Christine's towers, and I introduced the words *taller, tallest, shorter,* and *shortest.* When it was time to transition to free-play time, I noticed that Christine was anxiously looking at the unit blocks. At her turn to choose an activity area, she said excitedly, "I want to build with fat round blocks again!" She immediately began to recreate her tower of the day before. Showing Christine the photo of herself building, and inviting her to share it with the group, was enough to inspire her to persist in her building.

The following day Christine took out one of the hard plastic boards I had placed in the

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active role in documentation. I began to rely on them to tell me when they wanted pictures taken of specific structures. They also asked about taking their own photos. I eventually got an Instamatic camera the children could use, although I provided it only when children were clearly engaged in a building activity and when I saw that taking photos of their structures would help them to think more deeply about what they were doing (film is expensive too). I encouraged the children to think out what they nted to show in their photos before they began snapping pictures.

about how they could increase the chances of their towers staying up. In an effort to encourage their thinking, I asked, "How do you think you could get the building to stay up this time?"

"I know! We can wear hard hats," Ray-Shawn said as he took two off the shelf for himself and his friend. With the hard hats on their heads, they stacked the blocks up quickly once again, and again the structure toppled. "The hats don't work," said Ray-Shawn sadly.

I wanted to help the children focus on their own building strategies, as well as the characteristics of the blocks, and consider how these things affected the structures they were making. To do this, I created a challenge for the children and photographed the results. I asked them to use four different types of blocks to answer the question, "Which blocks will make the tallest tower?" Then I brought to the group four selected photographs from this activity, and we used these photos to compare the towers in different ways.

We first counted the blocks in each structure and next checked to see how high up each tower came on the child standing next to it in the photo. Nora's foamsquares tower only came to her knee, but Christine's unit-block tower was much taller than she was and clearly the highest of the four. "Fat round blocks make the biggest towers!" Christine exclaimed happily.

Photographs help children reflect on building experiences and articulate their strategies

After several weeks of building, many of the children became interested in building high towers. But I noticed that they often chose blocks haphazardly, without making any connection between what they wanted to build and what blocks they chose to use. I also noticed that younger children and less experienced builders seldom made a connection between their own building behaviors and the resulting structure.

With photographs, I was able to help Ray-Shawn and John overcome the disconnect problem. Day after day, the two boys had been piling up cardboard blocks without seeming to think

"Why do the fat round wood blocks make the tallest tower?" I wondered out loud. "What do you think?" I asked the children. "Because those blocks are bigger," said Christine. "Because they are harder," said Ena. "Because they are heavy," said Patrick.

Photos helped the builders reflect on aspects of their buildings. Sharing the photos helped other children solve design problems they were experiencing. One day Dayvian and Patrick were trying to make a roof on their waffle-block house, but it kept caving in. When we looked at photos of the house the next day, I asked Patrick what he was trying to do. He said, "Put a roof so the rain don't come in the house." I asked him to describe the problem they were having: "The roof keep falling down." Another child piped up, "It breaking in the middle."

As Patrick looked more closely at the photo he said, "The roof too big! Come on, Dayvian. We gots to make it smaller!" This conversation prompted Patrick and Dayvian to make the roof in a new way. Instead of making it two blocks wide they made it one block wide, thus avoiding the whole problem of a buckling seam in the middle.

Photographs help children analyze and synthesize data

I first realized that photos could be used as tools for analysis during a particular building sequence in which Kamela and Christina were engaged. Over a period of days they tried to build a houseboat using large waffle blocks. As I observed them, I realized they were using a hit-or-miss process. They had not discovered that each waffle block had to be fitted to the next in a specific way for additional blocks to fit correctly.

I began to take photos that focused specifically on their hands as they put the edges of individual blocks together. When I shared these photos with them, we talked about how they were fitting

together the slots in adjacent blocks. Then I asked them if there was a certain way that always worked.

When Kamela and Christina went back to work on their houseboat after our discussion of the photos, I noticed a change. Now when they attached two blocks, they immediately checked to see if the blocks aligned correctly before adding a third block. In studying the photos and talking about their methods, they had

Pluses for Digital Cameras in the Classroom

During the Building Structures Exploration project, I used a digital camera. I found it had several advantages over the standard cameras I had used in the past. Digital cameras can be quite inexpensive.

The miniviewer allows the teacher and children to see the photo directly after it is taken. This feature made it possible for us to discuss photos immediately. Also, with a digital camera I could discard poor-quality photos without the expense of printing them first.
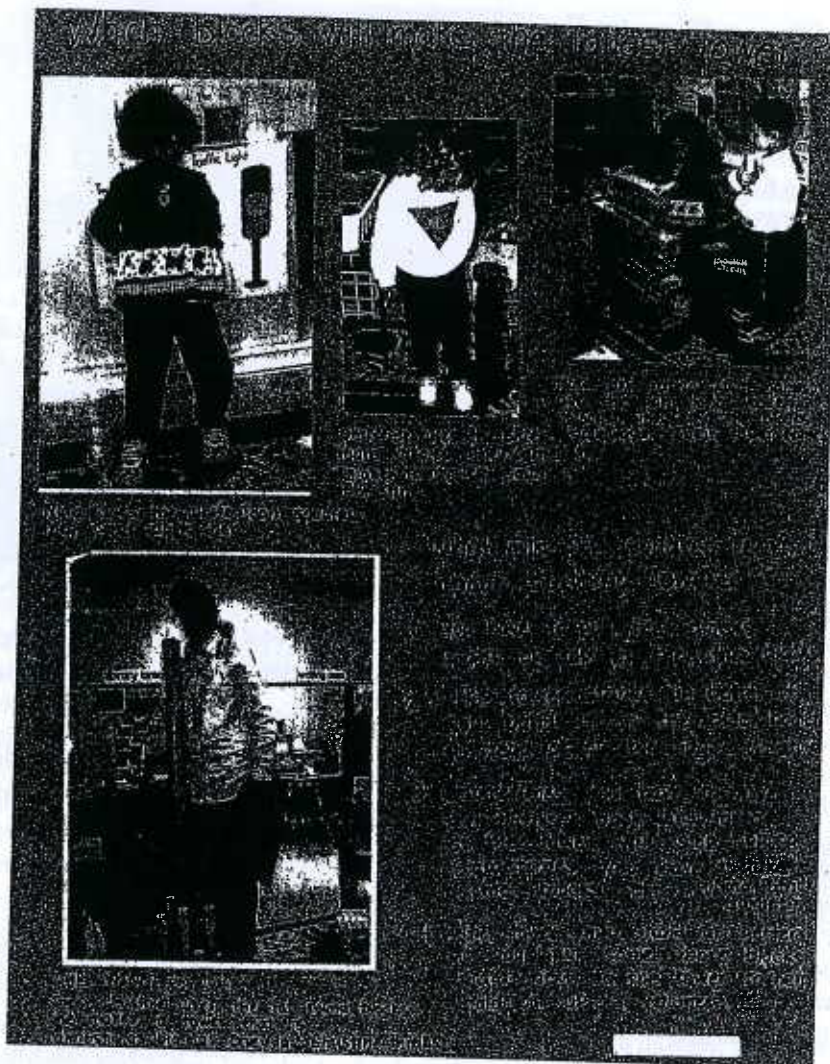
Editing photos on the computer allows the teacher to emphasize specific building materials and the strategies she wants children to focus on. For example, as I looked at the photos of Kamela and Christina's houseboat, I realized I wanted them to look more closely at exactly how they were placing individual waffle blocks together. Computer editing let me zoom in on their hands placing the blocks and enlarge these portions of the photo.

The teacher can manipulate the size of the prints. It was much easier for the children and me to look at structures, especially to observe design details, when I made larger prints.

Saving the photos to a computer file allows access to all or any of the photos taken during the unit at any time. Being able to look at all the photos taken over a period of time helped me to plan further explorations. For example, after reviewing the photos of children building with blocks that were taken over a period of weeks, I realized they were especially interested in learning how to build tall structures.

Individualizing is easier. Since I could also save photos of specific children in their own files, it was possible to observe how each child's building activity changed over time and to work with a child individually.

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cessful for making strong buildings was a gradual process. But I could see that the children were beginning to think about it. They were beginning to see patterns and make connections between their own explorations and discoveries and what we observed outside in the world. I especially knew that using photos had been instrumental in helping them to do this.

Conclusion

My experience using photographs with children during the Building Structures Exploration project was a powerful one for me as a teacher. It taught me that photographs are useful tools not only for literacy learning, social-emotional development, and assessment but also for science teaching and learning.

During the children's building exploration, photographs served as bridges between their various single building experiences and helped them to persist in building. Photos provided the means for children to step back from their actual building experiences so they could reflect and think specifi-

cally about materials and strategies. Using the photos as props for discussion allowed children to share their experiences, to hear other perspectives, and to generate new ideas for solving building problems.

The photos also supported children in their developing abilities to represent their building experiences symbolically and in encountering new challenges in the process. Photographs of multiple building experiences, taken over a long period of time, helped children to analyze what they had learned about the materials and specific building strategies and to make generalizations about their experiences.

As a preschool teacher who wants to support science learning, the camera has now become a routine piece of equipment in my classroom.

References

Helm, J.H., S. Beneke, & K. Steinheimer. 1998. *Windows on learning: Documenting young children's work.* New York: Teachers College Press.