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How Can Technology Enhance Children’s Natural Curiosity?

SUMMARY. We want children to WANT to learn. Since they have a natural curiosity about so many things in their world, it is only right to base our teaching strategies around this curiosity. If we disguise our teaching objectives as child-centered activities, our students will soon realize that learning is fun and not something to dread. People often have a natural bond with animals, especially with cats and dogs. We have used technology to support our students’ inquiry as they observed a puppy and kitten throughout several months. By linking technology with our county objectives, the Maryland School Performance Assessment Program science outcomes (MSPAP) and the National Science Education Standards we have provided the students with an exciting, real-world experience.

KEYWORDS. Children’s natural curiosity, observations, Maryland School Performance Assessment Program (MSPAP), National Science Education Standards

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Development of this case study was supported in part by NetTech (Northeast Regional Technology in Education Consortium).

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WHY INTEGRATE TECHNOLOGY INTO OUR LESSONS?

When the word *technology* comes to mind, one often immediately thinks of computers. However, the computer is just one aspect of technology. Educators have been using technology in their classrooms for years. Televisions, VCRs, videocassettes, audiocassette recorders, cameras, and copy machines are all examples of technology that have been used for many years without a second thought as to the extreme value they can bring to any lesson. When given new tools for teaching or a new outlook on how to use tools already on hand, many educators are motivated to try them out.

We knew that the newest technology at our school—updated computers, software, and a Smartboard—would motivate us as facilitators of our students’ learning, and we were thrilled with the opportunity of presenting lessons to our students using this new technology. We hoped that the existing technology would help as well. Our philosophy is that a motivated educator will promote motivated students. In this article, we will present how an educator can use various technology to enhance children’s natural curiosity while still meeting county objectives, state outcomes, and national science education standards. We used puppies and kittens in this case study. This subject can be changed to suit any learning situation. The activities can be modified to suit the subject as well as local and state standards. Paramount is the way in which a motivated educator uses the technology to meet the standards while maintaining student interest.

HOW TO ENHANCE CHILDREN’S NATURAL CURIOSITY

In Maryland a statewide assessment program was developed, the Maryland School Performance Assessment Program (MSPAP), to provide information to help improve instruction in the schools. Tasks involved in the assessment program are related to real-life experiences, require that students write a great deal, and integrate all subject areas. We often used of technology to create MSPAP tasks relevant to our puppy and kitten project. By doing so, we were able to give our students practice for these assessments. Throughout this project we were able to meet MSPAP science outcomes by our students’ being able to demonstrate their ability to:
1. Acquire and integrate major concepts and themes from the life sciences. (They acquired and integrated major concepts about cats and dogs.)

2. Employ the language, instruments, methods, and materials of science for collecting, organizing, interpreting and communicating information. (We emphasized learning the MSPAP vocabulary tasks for science K-3, since understanding these words would greatly increase performance on the assessments. We modified the vocabulary tasks, integrating them into our kitten and puppy project by using specific relevant language.)

3. Demonstrate ways of thinking and acting inherent in the practice of science. (Our students had to problem solve when they needed to weigh and measure the animals by writing down their observations, not their opinions, as they observed the animals.)

We incorporated the following National Science Education Standards into our project.

1. Standard A: As the teachers of science, we planned an inquiry-based science activity every visit with the puppy and kitten. The students were able to “play teacher.” They led the discussions, asked the questions, and found out the answers together as they observed, weighed, measured, played with, and took care of the puppy and kitten. In follow-up activities, the students continued their discussions and inquiries and eagerly waited for the next visitation day.

2. Standard B: As the teachers of science, we guided and facilitated learning science. We provided books, computer software, Internet sites, videos, and observation opportunities to help our students learn about puppies and kittens.

3. Standard C: As teachers of science, we engaged in ongoing assessment of our teaching and of student learning. We used various technology resources to aid us in meeting this standard, including audiocassette and videocassette recorders, cameras, and computers to assess our teaching as well as student learning.

4. Standard D: As teachers of science, we designed and managed learning environments that provide students with the time, space, and resources needed for learning science. Our puppy and kitten observation days were excellent examples of how this standard was met. Learning about general kitten and puppy behavior and
care was integrated into reading, language arts and math. Various stories and books were read about puppies and kittens. Graphs were made using the computer and then interpreted after learning information about some specific breeds of dogs from the Internet.

5. Standard E: As teachers of science, we feel we have developed a community of science social values conducive to science learning. Our students continued to make observations, ask questions, and problem solve science issues—not just specifically about puppies and kittens learning. Through our technology and their natural curiosity about puppies and kittens, our students have demonstrated much success in this area.

6. Standard F: As teachers of science, we have actively participated in the ongoing planning and development of the school science program. We have integrated this project into our county’s science program as well as into other discipline areas and are continuing to do so today. We have shared our project with peers, hoping to give them ideas on ways to get their students interested in science learning, and are willing to share with anyone who shows an interest.

SETTING THE SCENE

As educators, we both have similar teaching styles and enjoy creating our own lessons to go along with mandatory local and state outcomes. We decided to work together, not only because of common teaching styles, but because we believe that educators who share their ideas and don’t mind the peer mediation will grow professionally. We also realized that teaming up would be mutually beneficial in learning to use the newest technology at our school.

Our first objective was to find someone willing to share his or her new pets with 50 elementary school children. We wanted a very young puppy and kitten—ones that we could observe obvious changes in throughout the weeks. The animals were to visit our classrooms at least once a week. As it turned out, sometimes our first- and third-grade classes would team together, while other times they would remain separate. We shared our work as much as possible.
The following technological resources were available to us: an audio-cassette recorder, computers, camera, digital camera, Smartboard, video camera, videocassette recorder. We also had available to us various software programs, including Microsoft Word, Smart Notebook, KidPix, Graph Club, PrintMaster, and an e-mail program.

**Computers and Computer Software**

PrintMaster (Mattel Inc., 1998) was used to create transparencies, for borders on letters, to add graphics to journal pages, to create puppy and kitten stories, and for iron-on transfers. Graph Club (Tom Snyder Productions, 1998) was used for graphing practice. KidPix (Broderbund Inc., 1997) was used to create stories and can be used to create slide shows. SmartNotebook (Smart Technologies Inc., 1998) is the necessary software to use with the Smartboard. Microsoft Word (Microsoft Corporation, 1997) was used throughout this project. Teachers used it to create related activities.

Many of the MSPAP vocabulary tasks were modified. We made the MSPAP vocabulary words task-specific to meet the needs of our project. Some students used Word to type their own notes or to type whole-class notes for the students to refer to at a later time. This was a wonderful incentive for those students who lacked the will to write many notes. One first grader was kept motivated by being told that he could type his notes on the computer after he had written some down on his journal page. The students were able to e-mail other students about this project. Students who have home access to the Internet will be able to e-mail the kitten’s owner in the summer to find out about his progress. At this time, there has already been an exchange of e-mail about the kitten.

**Video Equipment**

A video camera was used to record the animal observation times and as a tool to more closely observe our students’ thinking and participation. The students’ questions and comments were recorded—no need to write as many anecdotal notes. As we watched and listened to the video, it brought back to mind the excitement of our students during the project and it helped keep us motivated as teachers.
For the initial observation, the academically weaker third-graders were paired with academically stronger first-graders as much as possible. This had two advantages. First, it gave the weaker first-graders more support from their partners. Secondly, it gave the weaker third-graders a chance to feel helpful without it being too much of a struggle since their partners were often the more capable first-grade writers. This pairing gave all the third-graders a sense of leadership, and they were eager to “play teacher.” The videos clearly showed this.

We were excited to see such wonderful interaction between the two classes. We had a few great surprises as the students worked together. A third-grader was caught on video teaching a first-grader a mini-lesson on subtraction. This resulted when we were trying to figure out the weight of the puppy. One student stepped on the scale and weighed himself. Then he stepped on the scale again while holding the puppy. The students then had to subtract the boy’s weight from the combined weight. The third-grader started tearing bits of paper to show the first-grader how to do a subtraction problem with regrouping. Rather than just telling his partner the answer, this student went through the process of getting the answer many times until he felt that his partner understood. Students are able to learn from each other. The adult doesn’t always have to be the teacher!

Likewise, we listened to ourselves and to the conversations that were taking place on the tape and made changes in the way these conversations were carried out. We questioned ourselves. Were we dominating the conversations? Were we interacting so much that it hindered the students’ chances to take charge or to problem solve on their own? We made mental notes to change the negative things and to continue the positive things.

Another use of the video camera was to record animal observation times for the students who were allergic and unable to participate in observation activities or for students who were absent. One first-grader was highly allergic. She had to leave the room when the animals were visiting. We were unable to have the camera set up for the first kitten visit due to a last-minute change in plans, but this first-grader wanted to record information anyway. She filled in information on her paper as the rest of the class discussed what they had observed. She listened and wrote down what she heard. She was eager to learn as much as possible about the kitten and didn’t mind writing. However, her comments about the second day of kitten observations, when the camera
was recording, made the teachers very aware that this use of technology would be extremely valuable to help all students feel included. She said, "Cats are my favorite animal. They’re so cute—but I’m so allergic. I’ve never seen one play very long. Wow! Francois (the kitten) likes to run and jump doesn’t he? I can see him on TV and it seems like he is here in our class." Her huge grin told the teachers that she had enjoyed her visit with the kitten. A full page of written notes was another sign that showed she was able to make lots of observations from the video. No student felt excluded.

**Audiocassette Recorder**

An audiocassette recorder was used solely for the teachers to reflect back on the observations and extended lessons. Later we were able to motivate more students by commenting on students’ responses heard on the tape. Just as we did with the video camera, we were able to reflect on how the conversations and observations were carried out. Did the children stay on track? Were we as teachers dominating the conversations?

**Smartboard**

The Smartboard resembles a mobile chalkboard or dry-erase board. It is used with a projector to project the computer screen’s image onto it—like an overhead projector. When used with Smart Notebook, software specifically for the Smartboard, it becomes “smart.” There is no longer a need to type at the computer’s keyboard because the Smartboard is touch-sensitive.

After giving the students the opportunity to observe the animals several times, we introduced our classes to the Smartboard. This piece of state-of-the-art technology is new at Hyattsville Elementary School. Years from now this will probably be a standard piece of technology in all schools. The lesson created for this project was the initial introduction of the Smartboard into the classroom. Using the Smartboard and its software, along with Microsoft Word and the Internet, we prepared a graph lesson on the computer. This lesson was then projected onto the Smartboard. The lesson took the students out onto the Internet to find out information about four breeds of dogs. After reading this information and discussing it, the students voted on their favorite
breed for a pet. They took into consideration the size of the dog, where they lived, and how much room the dog would need. We then made a bar graph from this data. The students were able to interact with the Smartboard. They could actually come up to the Smartboard and fill in the labels and color the bars for the graph. While the whole class was involved in creating the graph on the Smartboard, the students shaded in and completed a hard copy of the graph at their seats. This allowed everyone to stay on task while waiting for an opportunity to come up to the Smartboard and "touch." Their individual graph, along with a hard copy of the information found on the Internet, helped them with a homework assignment that night. They were to go home, present the information from the Web site to two people, and have them choose their favorite breed of dog. Then they were to compare these answers with our class graph and write about it. It was easy to keep motivated during this activity. The students were bursting with excitement with the use of new technology, and the teachers were too!

**Camera and Digital Camera**

We were fortunate to be able to loan a camera to the family who owned the kitten immediately after the kitten was born. Photographs were taken of the mother cat, the father cat, and the other babies. Each week a few photographs were taken. We were able to have a record of the kitten's growth from birth. The students were able to determine who the kitten looked more like—mother or father—and to make more observations about the kitten.

Both cameras were used to record the students and the animals as they interacted. Digital cameras provided instant photos into the computer. Film from regular cameras can be developed and scanned into the computer or can be developed directly onto a disk. Photographs have been used as story starters, to help students create books, and can be used to create slide shows using KidPix.

**EVALUATION**

Indeed, we want children to want to learn. Their natural curiosity toward puppies and kittens has been strengthened through the use of technology. This entire project was evidence that technology can motivate
children—especially when paired up with a hands-on, student-centered activity. The technology was the tool to help integrate the science activities with all other academic areas. Our own teaching methods were right in line with the National Science Education Standards—some naturally, while others consciously. The emphasis on the MSPAP vocabulary tasks helped the students understand the necessary terminology used on the test and helped the students learn to think like scientists.

Assessment was ongoing. We were able to determine that most of the students’ understanding of what it means to make observations has been strengthened considerably. We were pleasantly surprised and amazed to see that children who didn’t like to write and very often gave the teachers little or no writing in the classroom had few or no complaints when taking notes during the observations. One third-grader has written more for these observations than his teacher has seen for any other classroom assignment. We have learned that all of our students can be motivated to write.

Opportune timing for puppy or kitten visitations was sometimes difficult. First-grade and third-grade schedules can be quite different and impossible to change due to annual testing schedules. However, the pet owners were extremely flexible and sometimes the pets only visited one class rather than both classes. The puppy required more immediate attention from the students and only stayed for part of the day. When it visited, the activity was implemented immediately. The kitten stayed at school the entire day. The teachers were able to implement activities around their schedule for that particular day. However, sometimes the kitten decided that it was naptime, and some plans had to be modified or changed for that particular time of day!

Now that the school year is over and the summer days have begun, no doubt these students will keep our puppy and kitten close to heart. Unfortunately, the puppy has moved away. However, in September, since the entire project went so well, we will have a reunion between the kitten and students. We will observe the changes the kitten has gone through during the summer vacation. Then the observations may continue with our new group of students. Perhaps we will invite our former students into our rooms when the kitten visits. They could be a part of the science learning process for our new students. They will be able to report to our new classes what Francois (the kitten) used to do, look like, etc. Our cameras, computers, computer programs, and other technology resources will be valuable tools to help us remember what
Francois was like several months ago. Likewise, these same technology resources will be valuable tools to help us continue to make new observations. No doubt, conversations about this kitten will continue.

Whether discussing past or present observations, kittens or other subjects, the use of technology can indeed enhance students’ natural curiosity. Our students showed continuous signs of wanting to learn. The positive attitudes, questioning, comments, and written work have proved this to be a worthwhile project that any educator could modify and use to enhance student learning. We are looking forward to our new school year. We are motivated to continue using technology in a variety of ways. We know that it will enhance our students’ curiosity and will help to create a desire to learn.

REFERENCES
