Technology in K-2 Classrooms

Want to excite young learners about books and new vocabulary? Incoming kindergarten students in Calistoga Elementary (Napa County) took part in the Summer Bridges Program. They listened to storybooks with important vocabulary, read the same stories on iPads , played vocabulary and comprehension games, and did interactive skill building activities. Their comprehension of new vocabulary skyrocketed! In 13 days they were exposed to 100,000 new words and comprehension scores improved on average 20 percent. In some children comprehension went from 11% to 70%. Parents were trained on the iPads, which then were allowed to go home nightly with students. To see the video, go to the California Kindergarten Association (CKA) website or **http://www.youtube.com/watch?v=Krf52MtO5wE.**

K-2 teachers increasingly view technology as important as blocks, paints, crayons, and paper! These teachers use technology to support and extend children's learning and development, acquire knowledge, and communicate with families. But teachers also cautiously use technology. Mary Eming Young, Senior Public Health Specialist at The World Bank, has written that computers cannot replace human interaction or relationships, but can serve as a catalyst for social interactions and conversations. Adults' role is to ensure children have equal access to technology and obtain the benefits, but encourage children's play, conversations, and learning time with peers and adults, both with technology and in other learning areas of the classroom and outside. To be successful, technology use must be developmentally appropriate, active, intentionally planned, integrated, and evaluated for usefulness and quality.

Developmentally Appropriate

Young children use technology differently than older students. Technology must be active, hands-on, engaging, empowering, expanding their cognitive and social abilities, playful, enabling them to participate with others, offering self-correcting capability, and providing equal access for children learning English and children with special needs. How can any product do all this? Teachers shared many products and instructional practices for this article but realize better training is needed to more effectively use technology and more easily identify products to enhance early learning.

Technology can be one of many means to facilitate children's emotional development. Warren Buckleitner, a children's software expert, writes online that computers can encourage social development by facilitating collaboration, aiding communication (through a class book about a field trip, for example), and helping children feel good about their achievements (posting photos of their art and block structures on the class computer loop). More on this is at **www.scholastic.com/teachers/article/what-should-preschooler-know-about-technology**.

Catherine Shipp, a teacher in Orinda, uses Google and Cooliris images to expand children's knowledge about the animal kingdom, geography, and science topics. Each classroom has a Smart Board, which is similar to a whiteboard with a linked computer that enables interactive lessons, writing using digital ink, and work saved on the computer. Teachers share their good ideas online. Students also practice learning skills with fun games.

Active

Learning research has shown that students learn best by actively constructing knowledge from a combination of experience, interpretation, and structured interactions with peers and teachers. Technology allows young students to be actively involved, can accommodate their varying learning styles, and enhances their active roles in solving problems, communicating effectively, analyzing information, and designing solutions.

K/1 students make a PowerPoint presentation during their study of dinosaurs. They dictate or type sentences using sight words and read these sentences during Activity Time. Using a computer game, they build their own dinosaurs, using body parts from a variety of dinosaurs. They explain to peers and parents about their dinosaur. Students use a digital camera to document their daily school activities and create digital photo journals to represent their experience.

Intentionally Planned

Technology should be a means to an end, not used for technology's sake. It should contribute in meaningful ways to children's achievement of academic standards and maximizing their social, emotional and physical development. Teachers fine-tune lessons using technology just as they do with other instructional materials.

Pam Hernandez in Escondido USD teaches a grade 1/2 combination class where she is one of the district's IRead teachers (I Record Educational Audio Digitally). These teachers use digital audio tools (iPods, microphones, iTunes) to improve students' reading fluency. They understand that a student's fluency is linked to their comprehension.

Students record their voices reading a familiar passage. They can listen to how their reading sounds and may choose to re-record to improve their fluency. Students and teachers are involved in evaluation of their efforts. Some students listen to others reading, practice sight words, or create their own sequels to a story.

Another EUSD teacher selects stories based on reading levels for his students with special needs. In the first month of school, he shows how to record and students practice. Now students are able to read and record themselves on a daily basis and the teacher reviews their progress after class.

A second grade teacher uses an application that enables students to identify story elements, reflect on the story, import a picture for a report, and record themselves as they review the story elements and give the Author's Viewpoint. Students practice comprehension skills of predicting, inferring, questioning, summarizing, comparing and contrasting.

Integrated Technology

Technology integrated in the classroom environment, curriculum, and daily routines enhances children's development. When technology is part of the daily curriculum, children are free to explore the activity rather than focusing on the tool being used. One example is when children draw on a touch screen, save their drawings, and produce a class book. This becomes an additional way for children to represent their experiences, not replacing painting, markers, crayons, and clay for self-expression.

> *Teachers of 3-6 years olds in the University Primary School at the University of Illinois, Urbana-Champaign integrate technology as shown on its Knowledge websites where children's project work is displayed. They also post online Curriculum Webs to show how projects relate to standards. Classes also use interactive, real-time MRI to view developing chicken embryos when they incubate eggs in the classroom. Twice a week children manipulate the MRI scanner (housed at a Science Center), communicate their findings, and pose questions to students in other schools and professionals.*

Technology is also integrated by using it to measure and record children's development and share information with parents, families, and communities. Photographing children at work helps parents understand what is meant by developmentally appropriate practice. Photographs are shared at Back-to-School nights or in periodic newsletters, emails, or private Ed Glogster websites.

> *Bonnie Fend of Orinda sends out weekly newsletters including photos and information about classroom activities.*
>
> *Escondido teachers reflect on IRead projects they did with students and discuss outcomes with colleagues. At their website, educators read colleagues' postings that summarize the lesson and student responses. Colleagues offer suggestions for improvement or additional resources.*

Educational Software for Guiding Instruction developed one-on-one assessments for preschool and early primary teachers. Teachers assess students' literacy skills and results are immediately ready about individual students and the classroom as a whole. ESGI also prepares parent reports in English or Spanish. For more information, go to **www.esgisoftware.com**.

Technology is expensive, so educators should inform the community, funders, and policymakers about its educational results. What effect is there on children? How does it help their learning?

> *The Summer Bridges Program evaluated its effect on student comprehension and vocabulary growth and conveyed this information to the school board and the public through a YouTube video.*

Evaluated for Usefulness and Quality

Professional organizations such as Computer Science Teachers Association, Computer-Using Educators, SmartBrief on EdTech, and the Internet Searches are great sources for technology ideas and information.

> *Mara Guckian shared that she edits a series of books for preschool through grade 2 in science, engineering and math. Many of these are found at www.teachercreated.com – some are free.*

Do technology and screen media replace paints, crayons, playdough, or classroom books? Definitely not! But it is another item in the teacher's toolkit to engage young children and help them develop socially, emotionally, physically and cognitively. CKA posts ongoing technology tips at its website, **www.californiakindergartenassociation.org**.

~ Ada J. Hand

Ada J. Hand is currently president of the California Kindergarten Association. She is retired from the California Department of Education where she was the "Kindergarten Lady," consultant in Elementary Education and the Child Development Division, and manager of Healthy Start. She co-authored *First Class: A Guide for Early Primary Educators for CDE* and wrote *Continuity for Young Children: Positive Transitions to School*. After retirement she wrote a policy brief on transitions for the UCLA Center for Healthier Children, Families and Communities and started an early literacy network for the Orange County Children & Families Commission. She is passionate about teachers helping teachers to be developmentally appropriate, purposeful, and reflective about their instructional practices.

Resources

[1]The Summer Bridges Program was funded by Napa Learns, housed on the Calistoga Elementary campus (where it was supported by its tech department), given access to Footsteps to Brilliance iPad apps through the Napa County Office of Education, and taught by Kim Floyd, a teacher for Napa USD and a current teacher at Yountville Elementary.

[2]All references to technology products are illustrative and not meant as an endorsement of a product.

[3]Bransford, J.D., Brown, A.L., and Cocking, R.R., Eds. *How people learn: Brain, mind, experience and school*. Washington, DC: National Academy Press, 1999. Also Greeno, J., Collins, A., and Resnick, L.B. *Cognition and learning*. In Handbook of educational psychology. D.C. Berliner and R.C. Calfee, Eds. New York: Macmillan Library Reference, 1996. Both were cited in "Changing How and What Children Learn in School with Computer-Based Technologies" by J.M Roschelle, R.D. Pea, C.M. Hoadley, D.N. Gordin, & B.M. Means. See http://www.futureofchildren.org.

[4]Information is available through an Internet Search for "Digital Photography and Journals in a Kindergarten-First-Grade Classroom: Toward Meaningful Technology Integration in Early Childhood Education" by C.C.Ching, X.C. Wang, M. Shih, and Y. Kedem. Another thorough explanation of the benefits of using digital photography in early childhood classes is "Snap It Up! Using Digital Photography in Early Childhood, at http://goliath.ecnext.com/coms2/gi-0199-5148340/Snap-it-up-Using-digital.html.

[5]For full information, go to http://ceep.crc.uiuc.edu/eecearchive/books/fte/links/hertzog.pdf or do an Internet Search for "Connecting Families through Innovative Technology in an Early Childhood Gifted Program."