Benefits of Technology Education in Early Childhood

From the NAEYC – National Association for the Education of Young Children:
When used appropriately, technology and media can enhance children's cognitive and social abilities. Technology and media offer opportunities to extend learning in early childhood settings in much the same way as other materials, such as blocks, manipulatives, art materials, play materials, books, and writing materials. Screen media can expose children to animals, objects, people, landscapes, activities, and places that they cannot experience in person. Technology can also help children save, document, revisit, and share their real-life experiences through images, stories, and sounds. The active, appropriate use of technology and media can support and extend traditional materials in valuable ways. Research points to the positive effects of technology in children's learning and development, both cognitive and social *(Haugland 1999, 2000; Freeman & Somerindyke 2001; Heft & Swaminathan 2002; Clements & Sarama 2003a, 2003b; Fischer & Gillespie 2003; Rideout, Vandewater, & Wartella 2003; Greenfield 2004; Kirkorian, Wartella, & Anderson 2008; Linebarger, Piotrowski, & Lapierre 2009; Adams 2011).*

TEACHING COMPUTATIONAL THINKING AND CODING IN PRESCHOOL AND EARLY GRADES

Coding (or computer programming) is a newer type of literacy. Just as writing helps you organize your thinking and express your ideas, the same is true for coding. As young children code, they learn to create and express themselves with the computer, not just interact with it. In the process, children learn to solve problems and develop sequencing skills that are foundational for later academic success. They also use math and language in a meaningful and motivating context, supporting the development of early childhood numeracy and literacy.

Children, even as young as four years old, can learn the basics of programming! Believe it or not, we can teach them language like algorithms, sequencing, conditional statements, etc.

An **algorithm** is a set of instructions used to complete a task, and the **sequence**, or order, of the steps is important. We can teach this concept by acting out or describing the instructions for any familiar activity—putting on shoes, brushing teeth, feeding a pet.

Children can create picture cards to sequence a "program" for that activity, demonstrate what happens when the sequence is changed, or read a picture book in which a character travels to a clear sequence of locations. They can write a "program" for the character's movement, and then, using a map and a doll, run the program by moving the doll to each location on the map.

An **event** is a trigger that causes an algorithm or program to run, and **conditionals** define the set of conditions that must be present to run the program. Ringing bells, clapping hands, and turning lights on or off are all familiar events that teachers use as signals for classroom transitions. They can easily be turned into **conditional statements**: "If it is raining when the bell rings for recess…" or "If I am standing by the door when I clap my hands…." Age-old games like "Red Light, Green Light" and "Simon Says" can also be adapted to teach the concept of events and conditionals, while incorporating movement and playfulness.

Repeat loops signal how many times a **command** or sequence of commands should be repeated. In students' lives, each meal is a repeat loop of delivering a bite of food to the mouth, chewing, and swallowing. Our daily routines are repeat loops of waking, dressing, eating, going to school, returning home, playing, eating, undressing, and going to bed. These routines can be turned into "if, then, else" statements: "If the bowl has cereal in it, then repeat the eat loop, else put the spoon down." "If it is a weekday, then repeat the school loop, else stay home and play."

Songs and dances can be an active and fun way to teach the concept of repeat loops since many have repeating lyrics and movements.

These concepts can be further reinforced through work and play with age-appropriate online and offline programming apps and hands-on equipment like robots!

BACKED BY RESEARCH

Our experienced educators have done extensive research in finding the best and most developmentally-appropriate apps and activities that foster learning, active problem-solving and creativity. Apps like ABCmouse and Scratch Jr. are supported by a hefty amount of research and were carefully designed to match the abilities, interests, and developmental stages of preschool and primary grade children.

THE TIME IS NOW!

If we wait until children are older to begin working with technology and programming, we've missed out on an opportunity to make it easy to learn! As the old saying goes, "Young children's minds are like sponges." Another advantage of starting early is the opportunity to teach some important social and emotional skills along the way.

Schools must constantly look ahead to see what skills will be necessary in in their students' lifetimes. The ways they will work, interact, and communicate will continue to evolve, and the young children of today will need to be fluent in the types of thinking that will drive many of the tools and services of tomorrow!