Kids & Computers

Age-Appropriate Use of Computers with Young Children

By Connie Brennan
Owner/Director
Computertots/Computer Explorers

Questions about the use and effectiveness of computers in education are raised at all levels. These questions are debated most passionately about the early childhood ages (birth through 9).

Are young children physically and cognitively ready to use computers?

Will such use inhibit their social development?

Can computers help build skills or develop problem-solving ability?

Research has not answered these questions definitively. However, there has been a substantial increase in what we do know about the use of computers with young children.

Are computers developmentally appropriate for young children? This is probably the first question early childhood educators ask about computers. The concern is that children must reach the stage of concrete operations as defined by Piaget before they are ready to work with computers. Recent research, however, has found that preschoolers are more competent than has been thought and can, under certain conditions, exhibit thinking traditionally considered concrete.

A related concern is that computer use demands the ability to work with symbols - that is to say that computers are not concrete. This ignores, however, that much activity in which young children engage is symbolic. They communicate with gestures and language. They use symbols in their play and art. So, it appears that preschoolers are capable of some simple forms of abstract thought and expression.

But should they? Isn't this rushing them? One answer is that computers are no more dangerous than books or pencils - all could be used to push a child to read or write too soon. The most recent criticism I keep hearing is that it is harmful for children to be left unattended for extended periods of time in front of the computer. Dr. Jane Healy, author of *Failure to Connect: How Computers Affect Our Children's Minds* - for Better and Worse, in her National Association of Educators of Young Children keynote address, stated that children under the age of 7 should not use the computer. During the address she remarked that working alone and for extended periods of time on the computer was less beneficial than using blocks with a teacher. These children were observed to be isolated, frustrated and antisocial. Well, who wouldn't be under these circumstances? This type of criticism is neither credible nor valid. It's like saying eating is unhealthy. Of course it is if you eat the wrong things in excessive amounts. You could make the same claim for any unsupervised, excessive activity. When asked about parallel situations-facilitated learning during the educators' conference last fall, she did not address the issue.

A computer is not a babysitter. It is a tool that can be used to provide developmentally appropriate experiences. Adults play a significant role in successful computer use. Children are more attentive, more interested and less frustrated when an adult is present and providing guidance. Just as a swimming pool cannot teach children to swim, a book cannot teach children to read or a piano cannot teach children music, a computer alone cannot teach children how to use the computer.

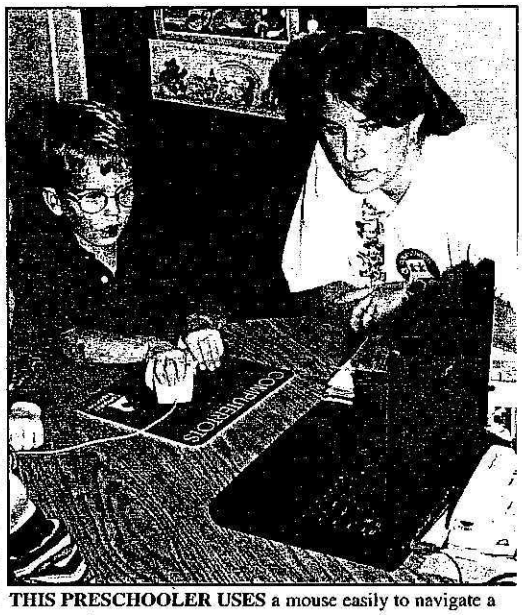
Successful computer use depends upon a system - a system which includes a guided facilitator (teacher), along with curriculum and software which are age-appropriate, open-ended and discovery-oriented.

Children's Interactions With Computers

Researchers agree, and it has been our observation, that children approach computers with enthusiasm, confidence, excitement and the absence of fear. Preschoolers can work cooperatively and with minimal instruction and supervision if they initially have adult support. And this is the key.

Using the standard keyboard is not a problem for young children, and, indeed, typing appears to be a source of motivation and sense of competence for many. Preschool children can successfully use age-appropriate software requiring that they press only a few single keys. Most are completely controlled by the mouse. My teachers report that most preschoolers prefer, use and demonstrate mastery of the mouse over the trackball. Within a couple of classes, most preschoolers have mastered simple mouse maneuvers such as point and click, and click and drag, and seem to understand the relationship between the mouse and the cursor. They can turn the computer on and off, properly remove and replace CDs and diskettes, follow instructions from a picture menu and talk meaningfully about their computer activity.

A computer center may vary from being among the most popular free-time activity to being chosen slightly less frequently than many other areas. Such differences may be due to the physical setup, the teacher interaction and especially the computer programs (software) used. Children prefer programs that are animated, problem-solving-oriented, and interactive - programs that give them a feeling of control over the computer. In most cases, 3- to 5-year-old children spend approximately the same amount of time playing in the computer center as drawing, talking or playing in the block or art centers. Attention span at this age rarely exceeds 30 minutes for any activity. Play in other important centers, such as blocks, is not decreased by the presence of a computer. Thus, the computer is an interesting, but not exclusive activity for young children.



THIS PRESCHOOLER USES a mouse easily to navigate a the game on the computer.

What are the benefits of computer use in the early childhood setting?

- Encourages social interaction.
- Increases cooperative learning.
- Enhances communication.
- Increases self-confidence/self-esteem.
- Children who use the computer are more task-oriented (persistent).
- Encourages fantasy and imagination.
- Benefits reading skill development.
- Computers may promote dramatic gains in a variety of math skills.

Equity: Girls and Boys

A consistent finding is that as early as the later elementary school years, boys have more access to computers, own more computers and use computers more frequently and with more control. Is this imbalance present in early childhood? There are some similar signs.

For example, a pair of studies found that, although children 5 years or older used computers similarly, boys younger than 5 used the computer more than did girls the same age. However, other studies have not revealed such differences. Considering the traditional heavy dominance of computer use by males, these researchers have suggested that the early

Continued on Page 1(

Age-Appropriate Use of Computers with Young Children

Continued From Page 15

years are the ideal time to introduce students to computers. Imagine what it might mean in the life of young girls to have positive, early experiences with computers before society convinces them that computers are for boys.

A COMPUTERTOTS TEACHER and her students celebrate their computer success.

Social/Emotional Development

During hundreds of Computertots and Computer Explorer classes, the teachers and I have observed the children enthusiastically and cooperatively working at the computer. Such episodes are strikingly inconsistent with the negative vision of isolated children working with computers. The concern that computers will stifle playful social interaction appears overstated. Children would either have to be forced or mesmerized into solitary use of computers for long periods. Actually, young children prefer social use of computers, and rarely work alone. The addition of a computer center does not disrupt ongoing play activities; many studies have found that computers encouraged social interaction. People affect how computers are used more than computers affect people. A frequent report is that children spontaneously and effectively help and teach each other while working on the computer. In sum, computers appear to facilitate certain positive social behaviors. Although they may not do so to a greater degree than other worthwhile learning centers, computer contexts appear to have one unique benefit: they facilitate both social and cognitive interactions.

Cognitive Effects

The type of software used influences these behaviors. A drawing program, for instance, tends to elicit more indicators of concentration, planning and social engagement than a construction and counting program. Studies have found that children's verbal statements are strongly affected by the characteristics of the software. Programs with definite correct answers elicit verbalizations about correctness and winning, but also encourage peer teaching. Open-ended programs elicit more wondering and hypothesizing, stimulating the imagination.

Language Development

Not surprisingly, increases in social interaction and positive attitudes help generate increased language use. In one report, preschoolers' language activity, measured as words spoken per minute, was almost twice as high at the computer as at any of the other activities including clay, blocks, art and games. Research with Logo indicates that it engenders interaction and language rich with emotion, humor and imagination. Reports such as these help allay the fear that computers will de-emphasize play and fantasy. When children are in control, they create fantasy in computer programs beyond the producers' imaginations.

Reading and Prereading

As early as 1972, Atkinson and Fletcher taught first graders to read with computer programs emphasizing letter recognition and recall, sight words, spelling, phonics and sentence and word meanings. Since then, it has been demonstrated that about 10 minutes work with computer-assisted instruction per day significantly benefits primary grade children's reading skill development. Similarly, preschoolers can develop such reading readiness abilities as visual discrimination and letter naming.

Writing

Why is writing skill so scarce? One reason may lie in its tedium; another in its lack of power. For young children, especially, spoken language provides them control over their environment. Their written language is anemic in comparison. But certain computer environments can infuse writing with control and power. The written word can create animated pictures and stories that can be heard. They can also reduce the tedium of writing. Writing on the computer allows children to maintain a sense of competence: "I did it by myself." It allows them right from the beginning to use written language for a purpose: communication. Children can experiment with letters and words without being distracted by the fine motor aspects of handwriting. When encouraged to use the computer as a tool, children write more, are less worried about making mistakes, take increased pride in their writing because text looks better, have fewer fine motor control problems and are more willing to take risks and revise.

Mathematics and Problem-Solving

Here's where computers really take the lead. Studies have shown that computers may promote dramatic gains in a variety of math skills. Even as young as age 3, children can complete counting and sorting activities on the computer as easily as from a concrete doll task. Certain graphics programs offer a new, dynamic way of drawing and exploring geometric concepts.

Task-Oriented

Certain programs will sustain the attention of the children for substantial time periods, even when they have the option to choose other activities. These children were task-oriented, motivated and persistent.

Conclusion

It is essential to note that a critical element in each of these successful efforts was an active role of the teacher - encouraging, questioning, prompting, modeling and, in general, mediating children's interaction with the computer.

We know that computers are neither panacea nor pernicious. There are potentially rich benefits to acquire through informed use of computers with young children. Informed, because inappropriate or insipid uses will have little or no benefit. Effectiveness depends critically on the quality of the software; the amount of time it is used, and the way in which it is used. The goal is to develop problem solvers, not programmers; communicators, not word processors; fulfilled children, not early achievers.

Connie Brennan is the owner and director of Computertots and Computer Explorers in the Savannah area.

How to Select the Right Software for Kids

Between the ages of 2 and 5, your child will be ready for computer software to enhance his or her experience. Here are some ideas to keep in mind when selecting software that is age-appropriate:

- Choose software that uses pictures and sounds rather than expecting young children to read instructions.
- The program should offer choices in the level of challenge so that a young child can feel comfortable with the speed and difficulty.
- There should be many learning options, such as letter association, numeral recognition and drawing.
- The program should offer the child positive feedback and encouragement.
- Stimulation should not be chaotic or frustrating, but inviting and exciting.

In selecting software, ask yourself:

- Is it at the right level for my child?
- Will my child understand what to do?
- Are the graphics clear and easy to see?
- Does the animation exhibit bias in showing only male characters winning?

By Dr. Vicki Folds, Vice President of Early Childhood Education for Tutor Time Child Care/Learning Systems Inc.