Early Childhood Teacher Candidates Evaluate Computer Software for Young Children

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The proliferation of computer software for young children necessitates that early childhood teachers have the knowledge and skills needed to evaluate and select developmentally appropriate software. This article describes the manner in which one university prepares early childhood teacher candidates to analyze software for the young children in their future classrooms.

A proliferation of computer software for young children and a pressure to use computers in early childhood education (birth to age eight) necessitate early childhood teachers acquire skill in selecting appropriate software. "Teacher training is essential for computers to be an effective teaching tool" (Haugland, 2000a, p. 3). For early childhood teachers to select software for their classrooms, they must be familiar with software and be able to evaluate not only the quality of the software but its appropriateness for young children. This article discusses two components of implementation of computers and computer software in early childhood classrooms. First, various views regarding computer use with young children are explored. Second, the author outlines the ways early childhood teacher candidates at Central Missouri State University (Central) are supported in evaluating computer software for young children.

The National Association for the Education of Young Children (NAEYC) (1996) stated teachers have an essential role as evaluator of technology's use with young children. To accurately select software for young

children, early childhood teachers need familiarity with evaluative criteria. They also need opportunities to practice using the criteria to evaluate software. Teachers use their own knowledge of child development and learning to make decisions about the use of technology and computer software to ensure benefits for the children they teach. "Developmentally appropriate software offers opportunities for collaborative play, learning, and creation" (NAEYC, 1996, p. 2). However, technology and computer software should be used as a part of the total day/curriculum and not instead of experiences with dramatic play, art, blocks, books, sensory materials, and manipulatives.

Haugland (1992) reported 3- and 4-year-old children have developmental gains in cognitive and fine motor skills when they use computers integrated with cross-curricular activities. Consequently, early childhood teachers should incorporate computers/computer software in classroom learning centers to support learning in all areas of the curriculum (Thouvenelle, 2000; Davis & Shade, 1994). An example might be using *Kid Pix* in the writing center to illustrate a story or book a child has written. In addition, teachers should extend learning from computer software to other curriculum areas to integrate learning across disciplines (NAEYC, 2001; Butzin, 2000). An example would be extending experiences from the software *Magic School Bus Explores Bugs* by having books about bugs in the library center, plastic bugs to count, sort, classify, and graph in the math center, live bugs in the science area with magnifying glasses and nonfiction books for identification and labeling, and writing prompts about bugs in the writing center. Finally, teachers might change "the way a computer software program was intended to be used" (National Center to Improve Practice in Special Education (NCIP), 1993) to accommodate children with special needs or to facilitate curriculum objectives.

Early childhood teachers know that young children learn through play and social interaction with peers and adults. Likewise, computer software should optimally be used in small groups so children are engaged in social interaction such as problem solving, sharing, and cooperating (Haugland, 2000a). One option is for the program to facilitate several players using the software. Another way to accomplish social interaction is to place two or three chairs at each computer station so that children engage in social skills such as sharing, negotiating turn taking, and resolving conflicts (Westminster College, 2001). A third option is to place the computers side-by-side so that children can communicate and peer tutor during activities even if they are using separate computers. In addition, "unlike television, however, the more interactive, child-controlled nature of some computer software can be conducive to sharing, taking turns and playing games together" (Children's Software Revue, 1998).

The NAEYC (1996) and Haugland (2000b) supported computers and computer software use by young children (3 to 8 years old) if the environment and equipment are developmentally appropriate. "Choosing appropriate software is similar to choosing appropriate books for the classroom—teachers constantly make judgments about what is age appropriate, individually appropriate, and culturally appropriate" (NAEYC, 1996, p. 2). The computer software should reflect the children in the classroom and address a variety of levels of ability, interests, and needs. In addition, early childhood teachers must use their professional experience in assessing computer software as a learning tool and balance the cost of technology with the other classroom equipment needs and materials.

An opposing view is held by the Alliance for Childhood (2000b) "computers pose serious health hazards to children. The risks include repetitive stress injuries, eyestrain, obesity, social isolation, and for some, long-term physical, emotional or intellectual development damage" (p. 1). Minkel (2001) agreed "our bodies aren't intended to sit, fixed in one position for hours, typing and clicking, with eyes focused on a screen" (p. 33). In addition, computers connect children to trivial games and isolate children emotionally and physically (Alliance for Childhood, 2000a). These views are valid if technology is used in ways that are not developmentally appropriate. However as computers become more prevalent in all aspects of children's lives from home to day care to school to department stores to science museums, it is inevitable that young children will be exposed to computer use. The choices early childhood teachers make when selecting and evaluating computer software for their students are vital for ensuring developmentally appropriate activities and learning (Haugland, 2000b; Buckleitner, 1999).

Consequently, preparing early childhood education candidates to select appropriate software and uses for computer software is crucial if technology is to help maximize each child's learning. Early childhood teacher candidates are supported in their learning about computer software through several steps. In class, they brainstorm issues related to computer use by young children and discuss the criteria to evaluate computer software. Next, the early childhood teacher candidates research journals and Internet sites to secure the most current information regarding the use of technology in early childhood education. After completing their research, the candidates post a synopsis of their information on an electronic discussion board for peers' review and comment. Then the teacher candidates apply the information learned by selecting, using, and evaluating a piece of computer software designed for early childhood children (birth to age eight). Finally, the early childhood teacher candidates write an analysis of the software they have evaluated and report their findings orally in class.

The analysis of the software is based on whether or not it meets computer goals for young children. The early childhood teacher candidates check to see if the software encourages social/emotional development (e.g., interaction, cooperation, self-concept, inhibits gender and culture stereotypes, and promotes positive attitudes toward computers) and cognitive development (e.g., increases thinking, reasoning, problem solving, stimulates play, and allows construction and revision of concepts). In addition, the early childhood teacher candidates evaluate the computer software on whether or not it is age, individually, and culturally appropriate, process rather than product oriented, allows for trial and error, and encourages child control, independent use, and growth in different developmental domains (social, cognitive, physical, social, emotional). A third area that the candidates assess is the technical aspect of the software such as whether or not the instructions are clear (hear and see) and the program is easy to maneuver (Haugland, 2000a and b; Westminster College, 2001; Children's Software Revue, 1998; Computer Learning Foundation, 1992). Finally, the students connect the software to theories studied in class such as sociocultural theory (Vygotsky), cognitive-developmental theory (Piaget) and multiple intelligences (Gardner) (Isenberg & Jalongo, 2001).

The early childhood teacher candidates present the information that they have learned to their peers in class. They also bring the software to class to demonstrate on a laptop, various points they have emphasized in their evaluative report. As the candidates present their software reports, the entire class brainstorms cross-curricular ideas that could be included in an early childhood classroom to extend learning from the software. For example, *Muppets Sorting and Ordering* software extension ideas include children sorting socks by color, making shape cookies, stringing beads to create a pattern, and reading books about shapes, colors, patterns, and numbers. Finally, this assignment is part of larger electronic portfolio that all early childhood education students must complete before they are recommended for certification.

In conclusion, "teachers' actions largely influence their students/ achievement" (Bitter & Pierson, 2002). Therefore, early childhood teachers' knowledge and attitudes are a vital part of children's learning with computers and computer software. Computer software is a "direct contrast to traditional programs where the learner is often passive and the teacher the conductor of content and actions" (Yelland, 1999). Consequently, early childhood candidates' familiarity and knowledge of computer software is vital if technology is to be educationally and developmentally appropriate for young children in their future classrooms (Davis & Shade, 1994; Hoot & Kimler, 1987).

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