Thematic Literature Review:

Interactive Technology and Emergent Literacy for Preschoolers

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Abstract

The purpose of this review is to assimilate information and research about the use of technology for the purpose of assisting learners age 2-5 years on developing their emergent literacy skills. Haugland (2000) believes that developing skills necessary to “become literate and perform competently in a literate society” begins quite early in a child’s life. There are conflicting ideals and a lack of current research on the developmentally appropriate use of technology on such young learners. Empirical evidence is necessary to support the use of current day technology in the preschool classroom. The premise of this literature review is that meaningful integration of technology can potentially enhance emergent literacy for preschool children but further research is necessary.

Keywords: Technology, emergent literacy, preschool, early childhood
Interactive Technology and Emergent Literacy...

Introduction

Young children today live in a world full of technology and interactive media. Technology tools for communication, collaboration, and networking have transformed mainstream culture. These tools have drastically changed how families run their daily lives. Many of these same tech tools are also affecting how teachers are running their classrooms. Technology and interactive media are here to stay. As children are introduced to technology earlier through their homes, it’s time to consider embracing the tools of the 21st century in our early education classrooms.

The early experiences that children engage in from birth through the time when they “adopt conventional literacy skills brings meaning to reading and writing” (Koenig, 1993). Emergent literacy is defined as the experiences that create the foundation of life-long literacy, which leads to both academic and personal success (Lankshear & Knobel, 2003). These early experiences include listening and responding to oral communication, interacting with written text (holding, pretend ‘reading’), and exploring the written and verbal world by turning pages, scribbling, and talking (Koenig, 1992). Children will vary greatly in how they access, use and engage in learning materials.

Many researchers and theorists support the idea that children engage in learning in different ways (Gardner, 1983; National Association for the Education of Young Children, 2012; Jackson, 2013). This suggests that integrating new ways of teaching emergent literacy skills can increase the engagement and overall learning process for many young learners. Technology is yet another tool that can be utilized, within developmentally appropriate framework, to provide variety in instruction and student exploration.
Methodology

For this literature review, article search procedures were conducted using electronic-based searches in the library system through the Educational Resources Information Center (ERIC), online through Google Scholar, and a manual search through journals, articles and textbooks. The majority of literature considered for further review was published since the year 2000. References to commonly supported theories or papers with a specific look at technology in the preschool classroom were included regardless of date of research. Research that involved children age 2-8 was the only research reviewed, eliminating literature with a focus on older students. Research by companies about the effectiveness of their specific programs or products was not included.

Interactive Media Use by Preschoolers

Multiple Intelligences. Howard Gardner (1987) has shown that young children exhibit a diversity of learning styles that he refers to as multiple intelligences. He believes that the optimum way for children to learn is opposite of the often-traditional teacher-directed verbal approach that we see in classrooms (Gardner, 1987). The use of technology in the young child’s classroom allows us to be sensitive to the different learning approaches of children (NAEYC, 1996). Technology allows us to integrate music, visual, movement, and other ‘intelligences’ into the same lesson. A suggested use of technology in the pre-K classroom is to use it as a center with equal value to all other centers (NAEYC, 1996). When we utilize computers or hand-held devices, centers can be used for exploration and build upon skills taught by other means.

Developmentally Appropriate Practice. “Developmentally appropriate practices must guide decisions about whether and when to integrate technology and interactive media into early childhood programs” (NAEYC, 2012). To understand what is developmentally appropriate, we
must have a clear understanding of the age of the children we are working with, their individual
differences in learning, and their personal backgrounds. Children ages 2-8 years are
developmentally within Piaget’s preoperational stage (NAEYC, 1996). This means they are
congrete learners who are very interested in using their newly learned symbols to speak, write,
draw, and use numbers (NAEYC, 2014). Children this age have a hard time sitting still, need a
frequent change in learning modalities and want to continue to master their language (NAEYC,
2009). Classroom goals and implementation change with age and differ from program to
program, but children’s experiences with technology and interactive media are increasingly part
of their lives and should be considered part of the developmentally appropriate framework
(Wardle, 1999).

The appropriate use of technology in the classroom is to expand, enrich, implement,
individualize, differentiate and extend the overall curriculum (Wardle, 1999). When educators
integrate technology into their classrooms, equity and access are achieved when all children have
opportunities to participate and learn. “Effective uses of technology and media are active, hands-
on, engaging, and empowering; give the child control; provide adaptive scaffolds to ease the
accomplishment of tasks; and are used as one of many options to support children’s learning”
(NAEYC, 2014). One of the benefits of technology is that it can easily incorporate scaffolding
into the curriculum by creating different levels of difficulty for different ability levels (NAEYC,
2014). This allows teachers to use programs that are designed to be appropriate to not just a
particular group, but also to different developmental levels within an age range (Haugland,
2000).

**Portable Touch Screen Devices.** While young children are capable of maneuvering and
clicking a mouse for a computer, portable digital devices such as iPads that use touch screen
technology seem to be more user-friendly for the younger learners. iPads and other touch devices offer “innovative opportunities for early literacy learning” (Van Scoter, 2001). iPad-based literacy activities can stimulate a child’s motivation and keep them concentrating by providing a hands-on environment (Fitzgerald, 2011). Buckeleitner (2011) agrees that “mobile, multitouch screens and new technologies have changed the way our youngest children interact with images, sounds and ideas.” Several apps have been developed for this age group that may “help children communicate, develop finger dexterity, learn about cause and effect and just have fun” (O’Hara and Pritchard, 2014).

**Motivation & Engagement.** Interactive media is capable of supporting the development of language and literacy of young children through the opportunities and motivation they provide (Kirkorian, H, Wartella, E, and Anderson, D, 2008). They have also been found to support children’s emotional development. Computers are intrinsically motivating for young children (Van Scoter, 2001). They have also been found to “enhance children’s self-concept and improve their attitudes about learning” (Lewin, 2000). Luckin (2003) found that age appropriate, interactive toys featuring fun characters helps foster a child’s emotional connection with the learning experience.

Technology can motivate and engage the learner (O’Hara and Pritchard, 2014). “The motivational elements of an interactive media product are those features that inspire children to play with them—features that make an interactive toy, book, web site or computer activity fun and engaging” (Calvert, 2006). Several motivational elements have been identified in the literature:

- Control: Children want to have control over their learning environment and see how their actions affect the outcome (Calvert, 2006).
• Action: Some research has demonstrated that action is another feature of media that can assist preschooler’s comprehension (Calvert, 2006).

• Clickables: Children love to have an interaction with clicking or touching that leads to a sound effect or animation sequence (Gilutz & Nielsen, 2002).

• Humor: Children enjoy content that is entertaining, funny and colorful (Gilutz & Nielsen, 2002).

**Interactive story books.** Interactive toys or books that “listen” to children have been found to support emergent literacy and affect their subsequent writing skills (Gilutz & Nielsen, 2002). Calvert (2006) found that interactive storybooks helped improve children’s phonological skills and story telling abilities. Levin (2001) found that interactive storybooks that allowed children to control the story and ask for help were most effective at helping beginning readers to recognize words. Such supporting research from over 5 years and separate studies suggests that combining interactive media with handheld, touch screen devices could even further engage children and support emergent literacy.

**Limitations**

A common argument against introducing technology into preschool classrooms is that young children may not be developmentally capable of using it. There are also sociocultural factors like family beliefs, interaction patterns and socioeconomic status that can create a digital divide between those who support use of technology in early childhood and those who caution against it. There is also concern about the correlation between interactive media and childhood obesity (Birch, Parker & Burns, 2011). Other negative outcomes have been identified such as irregular sleep patterns, focus and attention problems, negative impact on socialization, and negative impact on language development (Cordes & Miller, 2000).
The National Association for the Education of Young Children (NAEYC, 2014) cautions that the appeal of technology can lead to inappropriate use. Van Scoter (2001) notes that technology should follow the “same developmentally appropriate principles and practices that guide the use of all other materials and learning tools for young children.” The amount of time children spend with technology is important. How they’re spending that time should also be taken into account when determining if the technology is effective and appropriate (Vandewater & Lee, 2009).

**Outcomes**

Further research is needed to better understand how young children use and learn with technology and interactive media (NAEYC, 2014). Research is also needed to support evidence-based practice for the “effective and appropriate uses of technology and interactive media as tools for learning and development in early childhood settings” (NAEYC, 2009). NAEYC (2014) supports technology use in early childhood education when it’s used “intentionally and appropriately,” but they also stress “ongoing research and professional development are needed.”

**Conclusion**

The early years of childhood are a busy and important time for children’s cognitive, social, emotional, and physical development. As educators, we must develop our own strong and thorough understanding of media’s effects, as well as potential features, that ensure effective use and positive outcomes. All learning tools should be considered in developing skills of our youth. The successful integration of technology and interactive media means inviting it into our daily practices. Integration occurs when the use of technology and media becomes routine and transparent.
“Learning tools that, when used in intentional and developmentally appropriate ways and in conjunction with other traditional tools and materials, can support the development and learning of young children” (Fitzgerald, 2011). It is clear from the lack of research and literature that specific research into the gains of utilizing technology to increase student’s emergent literacy skills is needed. The background, theories, and professional support are in place to support such research.
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