Technology Recommendations for Young Children
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Introduction

Children are excited about technology and as early learners it is necessary for them to engage

and at times not engage with such tools, to boost their imagination and create learning experiences

that will live on long after they graduate from elementary, and eventually high school. Even though

children tend to be eager to embrace digital tools and technology, teachers struggle with how soon to

expose it in the classroom environment and how to do it safely. Many educators struggle with

questions regarding how early technology should be properly integrated into the

classroom. Similarly, parents often wrestle with the issue of introducing technology to their children

in the home environment.   According to Chip Donohue (2003) and Militello and Friend (2013), the

use of computers and other digital technologies continues to rise in early childhood and elementary

programs, and technology is being used as a tool for improving program quality in many interesting

ways (p. 17). Research carried out by Heft and Swaminathan (2002) shows that computer use

supports and increases young children's skills in the social, cognitive, language, literacy, writing, and

mathematics realms. Children in early childhood classrooms interact with peers and the Internet

when using computers. Wang and Ching (2003) also highlighted that children share and help one

another, ask for and provide information and explanations, and collaborate to solve problems.

The NAEYC (2009) has focused on innovative and effective uses for technology and

computers for infants and toddlers, preschoolers and those in kindergarten, along with school-

aged children. The following guidelines or recommendations are based on NAEYC standards:

Network Security

In order for technology to be properly integrated into any environment, network integrity,

reliability, and accessibility must be paramount. The users and content created must be

protected: children, educators, and resources using technology in a public school need to be shielded

from viruses, exposure to inappropriate content, and from possible cyber threats with the use of

network settings and firewall technology. Additionally, in a school setting, this important network

security must be balanced with easy access to resources in order for technology to be used

productively (Robinson, Brown, and Green 2010). Teachers are often stymied by access issues when

their students are prohibited from exploring targeted resources on the Internet and often refrain from

using technology if it is too cumbersome and restrictive.

Scenario

The integrity of the network and the resources on it must be protected by virus protection

software such as McAfee or Norton Antivirus. These two programs monitor, secure, and disable

threats to the network. Firewall technology such as Norton Internet Security and ZoneAlarm also

ensure the environment is not altered or used by outside users.

Network settings that protect the environment and are designed to prohibit users from

accessing sites, which are not developmentally appropriate for their age or for the school setting in

general. Careful selection of which sites to block such as social media sites, sites with inappropriate

content, or sites where personal information is shared is useful in protecting the users and the

network from harm but can become a roadblock for educators. Teachers often require full access to

sites and cannot be hindered by too tight a restriction on the student's freedom to research and

explore developmentally appropriate content and tools. If an elementary teacher designs a lesson that

includes the students accessing a particular video on YouTube about Martin Luther King, Jr., they

need to be sure the student doesn't explore other areas of the site by fully utilizing the YouTube

Safety Settings.

Digital Citizenship

Digital Citizenship is a concept that helps teachers, technology leaders, and parents to

understand what students as technology users should know to use technology appropriately (Ribble,

2010).   Digital Citizenship should be integrated into existing content areas when technology is introduced to ensure the success of technology use and the protection of the students who use it. At home, parents must ensure children are using technology in ways that are meaningful, relevant, and respectful of one another and ensure that bullying, inappropriate website viewing and plagiarism are avoided (NAEYC, 2009).

Scenario

Practicing password safety is critical to early childhood educators, parents and their students. With technology becoming ubiquitous, children need multiple passwords to use the network at school, Google Chrome, their email account, watch movies on Netflix and to access a host of social media sites and internet-based games. Password safety tips are as follows:

- Share only with trusted parents or guardians.

- Do not use words found in the dictionary.

- Use the first letter of familiar phrases such as, "I love Taylor Swift" would be ILTS.

- Use a combination of characters when using familiar names such as dog$molly or fluffy#cat.

Children need to be aware that people online may not be what they appear: an avatar depicting a kindly grandmother or a biography claiming to be a nine-year old girl may not be accurate. These types of users pose a threat to students within a classroom and at home. With the introduction of the new Harassment, Intimidation, and Bullying legislation, schools must take serious precautions to protect the victims of bullying.   In a study entitled the GoodPlay Project, it was found that one-third of students who presented with a cyber-bullying scenario did not report it (Santo, 2009).

Digital Divide

Technology should be used to close the achievement gap, improve linguistic issues and limit the digital divide (NAEYC, 2009). The "digital divide" is defined by Stanford University as the socioeconomic and other disparities between those people who have opportunities and skills enabling them to benefit from digital resources, especially the Internet, and those who do not have these opportunities or skills. Teachers and parents must work toward helping children achieve in school and go on to lead satisfying and productive lives (NAEYC, 2009). This means that teachers must work toward dispelling the fear that technology is going to widen the gaps that we already see in education.

<div align="center">Scenario</div>

The use of digital storytelling is being practiced in schools, libraries and neighborhood community centers. Daniel Meadows, a British photographer coined the term digital storytelling that is the practice of using computer-based tools to tell stories (Robin, 2015). Photographs and videos are very accessible and this was not the case a generation ago. Harnessing this access provides children authentic learning experiences to learn about communities and cultures throughout the world (Johnson, 2012) and these help to build awareness and background knowledge. Students from early childhood programs both locally and internationally are using digital storytelling in various content areas and across grade levels. And digital storytelling not only keeps children engaged, it also encourages higher-level thinking, states Johnson (2012). Children in second grade in Puerto Rico can view videos of family traditions in another culture to compare and contrast cultural and family values. Bahamian students in kindergarten can become virtual pen-pals with Latino and American students. Additionally, support could be provided for dual language learners using technology as recommended by NAEYC (2009) since school culture often conflicts with students' cultural backgrounds. Several websites encourage

children to tap into their creative imaginations to produce digital stories online and their own animated tales—these include Story Bird, Bird Tales and Zimmer Twins. The digital divide is still very much present in the U.S…only 71% of Americans actually subscribed to broadband at home—an adoption rate lower than other nations with a similar GDP. That adoption rate is even lower among African-Americans and Hispanics (Goodman, 2013). School administrators and teachers can help in a meaningful way by:

- Surveying students to determine the percentage of your student population that doesn't have home Internet access.
- When planning technology projects and choosing devices, consider a device's capacity for offline use.
- Ask teachers to design homework assignments that don't require Internet connectivity—or give students more access to the Internet during school hours (Sauers & McLeod, 2012).
- Consider leasing wireless hotspots that students can check out for home use.
- Work with community agencies to provide Internet connectivity (Cavanagh, 2014).

All parents may not participate or partner with schools to close the digital gap but most will want extended learning opportunities for their children.

Technology Evaluation for young children

Technology should be evaluated before purchase, just like any other classroom material (Puerling, 2012; Herrold 2015). Teachers and administrators need to consider implementation strategies, the role of professional development, and how certain technologies will support the curriculum goals and visions. According to the NAEYC (2009), teacher knowledge and decision-making is vital to educational effectiveness. Based on this widespread recognition and the context of early childhood education today, it was decided this statement would highlight three challenges: reducing learning gaps and increasing the achievement of all children; creating

improved, better connected education for preschool and elementary children; and recognizing teacher knowledge and decision making as vital to educational effectiveness (p. 2).

Scenario

Teachers should sit down and explore budget and curriculum goals. In the school environment, attitude plays a major part when it comes to making a change or moving in a different direction especially in the area of technology use in the classroom. Professional development is needed for exposing teachers to research that demonstrates that using technology is more effective than traditional methods (Johnson, 2012; McManis & Gunnewig, 2012). As noted earlier, parents want to extend and expand their child's learning.

Teachers should undergo training that will help them do a better job and continue to advocate for school budgets that spend more on technology to improve teaching and student learning (Johnson, 2012, p. 19). The transformational use of technology changes the role of the teacher as well as what is taught and how it is taught. All classroom materials should be chosen carefully so that they meet the developmental and learning needs of the children. Teachers should use assistive and adaptive technologies with students with special needs (Woolfolk, 2010). Geoffrey Moore, in his book *Inside the Tornado* (2004), neatly divides educators implementing new technologies into the classroom as visionaries and pragmatists, and suggests the need for administrators to work with each group differently (p. 18). Additionally, teachers should gain the support of parents and develop their technological skills to determine which technologies fit best for their curriculum and school.

Learning and Development

Despite contradicting views, studies suggest that technology aids in the learning and development of young children. Supporting evidence was found in a review of 94 studies

conducted on the subject (Hsin, et al, 2014).   It was reported that children benefit from technology when adults provide a safe environment conducive to learning, and involve them in the activity by establishing goals.   According to most studies cited in the report, technology alone is not enough to improve learning. It is the teaching of adults, whether teachers or caregivers, that increase the impact of technology in the learning process. In addition, exposing children to different technologies can help develop skills that will later be valuable once they start school. Learning to communicate, exploring the creation of others and expressing their ideas creatively are skills that will aide in formal learning (McPake & Stephen, 2013).

Scenario

Educational institutions should build upon the experiences that children have gained at home using domestic digital technologies. The following list serves as a guide to promote activities in and outside the school environment that support the learning and development of young children (McPike & Stephen, 2013).

- Technical skills to support communicative practices: main functions of different technologies, keyboard symbols and using a mouse.

- Competence in communicating over time and distance: sending text messages, using e-mail, and sending and receiving digital photographs.

- Exploring, combining and transforming narrative expression: watching TV/DVDs, engaging with interactive digital storybooks or websites, or acting scenes from favorite programs and films.

- Exploring, combining and transforming visual expression: using emoticons, and taking and editing photographs and videos.

- Exploring, combining and transforming musical expression: Listening to music from a variety of digital resources, learning and performing familiar songs, and making own songs and music.

Social, Cultural and Creative Interaction

Studies of young children and technology have found that social development is supported by technology in three areas: the enhancement of children's collaboration with peers, the maintenance of family relationships through adult-child interaction while using technology; and the development of multiculturalism by being exposed to television programs (Hsin, et al, 2014).

Creativity is another important aspect in child development. In a statement by the National Association for the Education of Young Children (2012) it is recommended that children must have opportunities to explore technology and interactive media, in order to foster creativity. The exploration has to be in the form of play. This can be accomplished through the incorporation of games.

Scenario

When it comes to social and cultural development, it is imperative to maintain the connection between home and school instruction. The experiences the children have at home will somewhat influence their experience at home and vice versa. Allowing children to add photos, emoticons, or participate in creating home videos that are later shared with relatives help in building social networks at a young age (McPake & Stephen, 2013).

In the classroom, the use of games and interactive books can also stimulate creativity, and social interaction among peers. In a case of a five-year-old kindergartner that was captivated by the story of the Titanic the teachers incorporated a book and interactive CD-ROM in order to

allow him explore the ship. Using manipulatives, art materials, free play and a desktop computer, the child narrated the story of the Titanic as he explored it virtually. As a result, classmates turned interested in the topic. Consequently, he was able to strengthen the social bond with his classmates by sharing a story that he was fascinated with (Bailey, nd).

Conclusion

To conclude, early childhood educators must be exposed to current research, promising programs and practices for teaching with technology in early childhood education that are based on the National Association for the Education of Young Children (NAEYC, 2012) & Fred Rogers Center joint position statement on Technology and Interactive Media and his framework for Quality in Children's Digital Media. Pedagogical principles, classroom practices, and teaching strategies can be presented in a practical, straightforward way informed by child development theory, developmentally appropriate practice and research on effective, appropriate, and intentional use of technology in early childhood settings (Donahue, 2003). As early childhood educators learn how to effectively integrate technology into the early childhood classroom and across the curriculum, educators need experiences that integrate technology tools and interactive media into the courses they take and the trainings they attend. Donahue (2003) emphasizes that they need to understand the influence of technology and digital media on young children, parents, families and communities. These educators need opportunities to learn with and about technology in order to make informed decisions about how, when and why to support early learning and healthy development through technology and digital media (NAEYC, 2012, p. 5). It is especially important for strengthening the home-school connection.

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