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Recommendation for Technology Use in an Early Childhood Program

Children naturally explore and learn about their world through inquiry, and technology offers an accessible tool for extending that range of inquiry. According to the National Association for the Education of Young Children (NAEYC) (2009) "Technology can enable children with a range of functional abilities to participate in activities and experiences". This paper offers some recommendations on the use of technology in an early childhood education setting. Pre-service teacher preparation, ongoing professional development and the consideration of children's life beyond school all play a role in the efficacy of technological application in learning activities for young children.

Knowledgeable adult's role

Knowledgeable adults play a critical role in the relationship between children and their technology use. Ching-Ting, Ming-Chaun & Chin-Chung (2014), discussed four aspects of adults' role in children's technology use as follows. First, adults facilitate children's engagement in utilizing technology for learning (Eagle, 2012; McKenny & Voogt, 2009, as cited by Ching-Ting, Ming-Chaun & Chin-Chung, 2014). Second, adults adapt their teaching based on the children's understanding of the technology-integrated learning (Shamir, Korat & Barbi, 2008 as cited by Ching-Ting, Ming-Chaun & Chin-Chung, 2014). Third, knowledgeable adults make the decision whether to support their instruction with technology or not based on their perceptions of children's technology use and whether that use would enhance learning or impede development (Cviko et al., 2012 as cited by Ching-Ting, Ming-Chaun & Chin-Chung, 2014). Fourth, adults'

teaching in conjunction with technology-assisted learning maximize the effect of technology on children's learning (Segal-Drori et al., 2010 as cited by Ching-Ting, Ming-Chaun & Chin-Chung, 2014).

A 3-year old study examination of early childhood teacher preparation practices found that while preservice teachers may envision using technology in their classroom in the future, in practice there is resistance to use of technology for the delivery of instruction given that it is often perceived to 'interfere' with their relationship with the children (Laffey, 2004 as cited by Parette, Quesenberry & Blum, 2010).

Ongoing professional development for teachers after the initial training

Due to the ubiquitous availability of powerful technologies for early childhood education professionals, ongoing professional development is becoming ever more important (Parette et al., 2013). Parette suggests Technology User Groups as an alternative structure for developing both instructional technology (IT) and assistive technology (AT). Gibbons et al., (1997 as cited by Parette, 2013) argues that short-term professional development activities in form of workshops might not produce significant change among classroom practitioners. A technology user group is defined as a group of early childhood education professionals who (a) have a shared interest in IT and AT (b) dedicated to developing new skill sets about IT and AT devices for the purpose of integrating them into instruction (c) are supported for participating in the user technology group (d) are willing to share their learning with other early childhood education professionals (Parette et al., (2007b as cited by Parette et al., 2013)

In a study that examined the use of Web 2.0 tools such as Voki, Vodcasts and VoiceThread in early childhood education showed that using technology to engage students in

collaborative tasks deepens their understanding of math concepts by offering rigorous learning through relevant projects with authentic audience (Cinnoni, 2014).

Consideration of children's experiences prior to school

National Association of Education of Young Children (NAEYC) 2009 report recommend including the social and cultural contexts of young children into consideration when it comes to designing a developmentally appropriate practice. Educational professionals' knowledge of the technological practices that children bring to school will allow them to create more appropriate programs in the first year of school. Young children come into school with rich experience from home, their independent and teacher-assisted activities incorporate a wide range of prior technological knowledge and understanding (Mawson, 2013).

Two separate studies in New Zealand, the first targeting children ages 3-4 at an early childhood center and a kindergarten investigated the nature of children's collaborative play. The second targeted teacher roles in developing long-term projects was carried out in a different kindergarten. The combined results from two studies found out that children in study showed a sophisticated awareness and use of a technological process. They showed a well-developed ability to establish and solve technological tasks, but that ability is not appreciated by most primary school teachers (Martin & Hay, 2008 as cited by Mawson, 2013).

Keyboarding for elementary students

With the increase availability of computers in classrooms and households students now have a greater opportunity to use one. The question at hand is when should students learn how to properly type. According to Zehr (1999) you need to teach students how to keyboard correctly otherwise they will develop poor habits and once developed they will become hard to break.

Similar to handwriting this is a skill that the students will be able to learn both inside and outside of the walls of the school.

Keyboarding can start out as a separate course in the beginning for students, but after they have become familiar with the skill it can easily be intertwined in other activities. The most natural activity is to have students complete their writing tasks on the computer. Studies have shown that students that write their papers on computers have submitted better crafted papers (Barack, 2005). Charlotte Wright, the technology coordinator for Anderson County schools in Lawrenceburg, Kentucky shared this from her experiences, "What we found out didn't work was having the children handwrite a piece and copy it [onto the computer]. We've moved more and more in the direction of 'let's just do it on the computer.'" (Zehr, 1999).

Teaching keyboarding is something that can be done both inside and outside of the classroom. With the availability of online programs, some of which are free, parents can feel comfortable allowing their children access to the home computer, especially if they are working on their keyboarding skills. One way to gain students interest in keyboarding is by gamifying the concept of typing, which can be done by using Metero Typing Blast (Parker and Lazaros, 2014). In addition to teaching students keyboarding, learning how to type can also exercise a students' multitasking ability, develop dexterity and hand-eye coordination (Parker and Lazaros, 2014).

Physical activity

One of the most common concerns today with the increase in technology accessibility for children is that instead of going outside and playing they will now spend time in front of the computer or television playing games. The solution to this has been to develop games and activities for children that require physical movements. Some of the benefits of physical activity

for children are more efficient body functioning, weight control, reduced risk of chronic diseases, and an improvement in the quality of life (Bouchard, Shephard, Stephens, Sutton, and McPherson, 1988 as cited by Thompson, Rehman, and Humbert, 2005).

An approach to getting children to become more active is by finding ways to incorporate physical activity into their everyday play. Ninentendo, the makers of the Wii, have done this by developing a game system that requires physical movement while holding the controllers. In a study conducted at the University of Nebraska they found that active video game playing requires more than twice as much energy as a traditional video game (Hendry, 2008). In another study conducted in the Netherlands they found several of the games raised activity levels enough to meet the health guidelines for moderate-intensity activity (Hendry, 2008).

Schools do not have to leave video gaming to be done just at home. One category of games that has found their way into classrooms are those that involves dancing like Dance Dance Revolution and Just Dance. At Conlee Elementary School in Las Cruces, New Mexico the staff began the school day with students doing five minutes of Just Dance daily and the rate of tardiness decreased (Hellmich, 2010). A research study at West Virginia University in which overweight and obese kids completed 30 minutes of Dance Dance Revolution five days a week for 12 weeks at home resulted in finding a halt in their weight gain and improved fitness (Hellmich, 2010).

SMART Boards

The development and introduction of SMART Boards into classrooms, especially those in elementary schools, have provided a new opportunity to allow students and teachers to interact with the content directly on a large screen for everyone to see. The SMART Board is a type of interactive whiteboard that displays the image from a computer and the surface is similar to a

giant touch screen (Preston and Mowbray, 2008). Utilizing this technology in the classroom gets everyone involved when instruction is planned accordingly.

One of the first benefits to the use of a SMART Board is that the information you display on it can easily be saved. This can be beneficial to a teacher since some activities can take time to put together, but now they only need to spend the time once and will be able to reuse saved materials for future classes. Another benefit of the SMART Board is the ability to share. Teachers can now put together presentations and documents that are enhanced by this technology and share them with their colleagues. The SMART Board also has the ability to record information making it easy for teachers to quickly refer back to something during a class, when in the past once the board was erased the information was gone.

For students having a SMART Board in the classroom can help support the visual-spatial, auditory and kinaesthetic learners (Preston and Mowbray, 2008). The younger students become motivated with the big screen in the classroom which is easy to see and when given the opportunity the students can become part of a lesson by going to the board and touching the screen to either select or move objects around. One activity for a science class was to sort items into two categories, which can now be done at the SMART Board as the introduction to a lesson for teachers to get a quick check of what knowledge their students already have.

SMART Boards also have a place in other disciplines. The music classroom is an area that the SMART Board has really begun to show benefits. Teachers are now able to display an entire piece of music on the board and using the tools built into the SMART Board annotates what is being seen for the students (McNamara-Cabral, 2012). The SMART Board also allows the teachers to easily show videos to the students so they have a better understanding of the material.

Time allocations and limitations for the use of technology

"When used appropriately, technology and interactive media have tremendous potential to nurture early learning and development. It is also recommended that it not be used for children under the age of 2. Additionally, the use of technology without proper guidance may interfere with students in ages 2-5 (NAEYC, 2009). Teachers may utilize technology as a resource but must be careful not to use it exclusively because students are successful with it. Students must be allowed to develop problem-solving strategies through various learning activities and through social interaction. Active play is an important part of Early Childhood Education (ECE), and technology use should support this goal. Sedentary technology use is associated with increased rates of obesity, but incorporating technology into active play (e.g., exploring outdoor environments while using a tablet to identify wildlife, exercise-based games on such devices as the Wii gaming system) can reduce the likelihood of negative health effects associated with technology use among young children (Daugherty, Dossani Johnson & Wright, 2014).

Curriculum Alignment

In early childhood education, there is a separate curriculum for students in primary and elementary grades. This causes a disconnect and makes it more difficult for the students to learn and retain information. Current research is emphasizing that technology in early learning programs "supports and increases young children's skills in social, cognitive, language, literacy, writing and mathematics realms" (McManis & Gunnewig, 2012). This is also true for technology where students in middle school classes are learning to type along with learning how to research a topic of study. If students are introduced to keyboarding earlier as it was stated earlier, students may be able to make an easier transition. Students are also currently preparing

for PARCC online assessment in grades 3-8. Many schools are not only preparing their students for the math and language arts content but the technology content as well in order to complete the assessment. By aligning the curriculum at an early age in order to introduce areas of technology students will need as become older.

Early childhood education and technology are similar in that they both are constantly evolving. When technology changes and becomes more adaptable to meet the needs of the youngest population so does the way they are taught. Although technology has advanced for schools, some of these changes have also had an effect on how technology can be used at home. The students are not the only group that needs to adapt with the latest changes in technology. The teachers have to be ready to make the necessary adjustments as well.

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