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# Pre-school Children and IT

Ng Pak Tee

Introduction

Children of this generation are growing up in a rapidly changing world characterized by dramatic shifts in what they are expected to know and be able to do. There are new areas of learning for them, especially due to technological advancement in information and communication technology – this is the age of computers and the Internet. Children of this generation are going to meet a world vastly different from the one the previous generation has faced. Instead of letters, they have e-mails. Instead of reading books, they read information from websites and CD-ROMs. Many primary schools in Singapore already have information technology (IT) programmes for their students. As Singapore reviews its pre-school education, an appropriate question here is whether some form of IT curriculum is beneficial for pre-schoolers. This article reviews what research says about using computers for pre-schoolers and discusses some potential pitfalls.

What Research Says about Computers for Pre-schoolers

Some research has suggested that there are benefits to be reaped in using computers for pre-schoolers. According to Haugland (1992), the children who use computers with supporting activities that reinforce the major objectives of the programmes have significantly greater developmental gains when compared to children without computer experiences in similar classrooms. These developmental gains include intelligence, non-verbal skills, structural knowledge, long-term memory, manual dexterity, verbal skills, problem-solving, abstraction, and conceptual skills.

Interestingly, through the usage of computers, these children share leadership roles more frequently and develop positive attitudes toward learning (Cardelle-Elawar & Wetzel, 1995; Denning & Smith, 1997; Haugland & Wright, 1997; Matthew, 1997). Moreover, they exhibit higher levels of "effectance motivation", the belief that they can change or affect their environment (Nastasi & Clements, 1994).
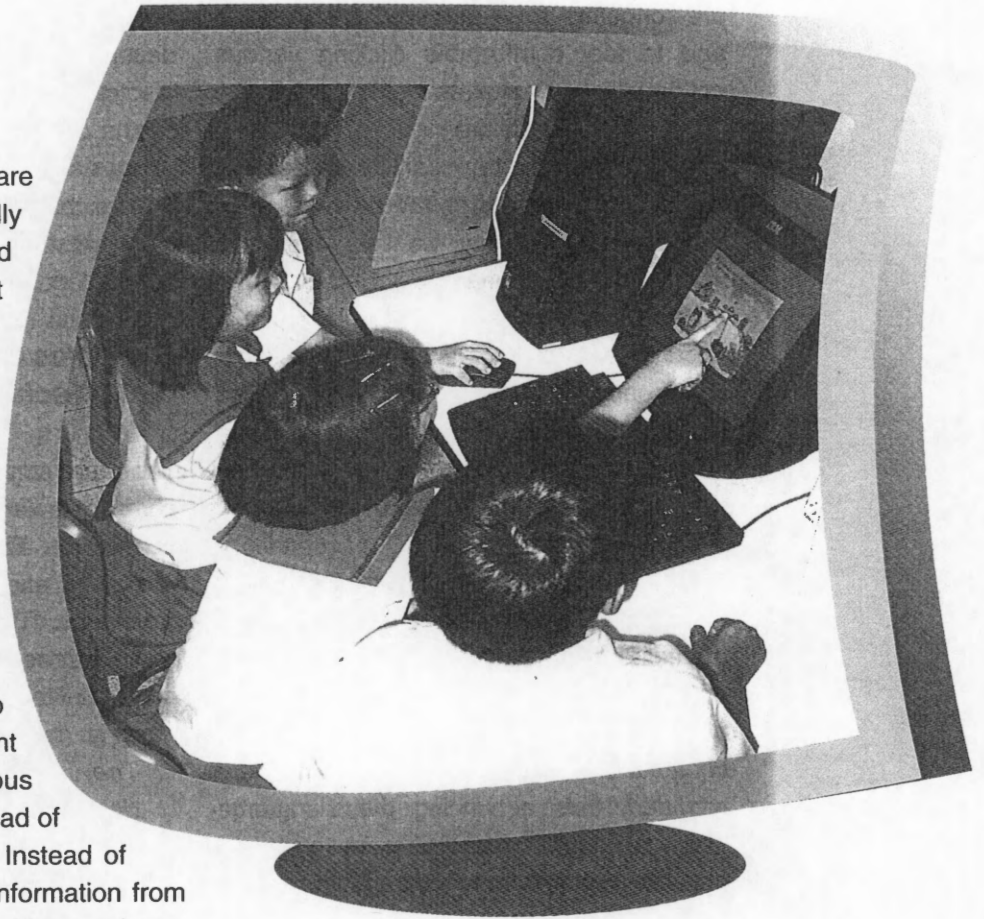
The computer centre can be a valuable activity centre for learning. However, the focus of the centre should not be to teach anything particular through the computer. Rather, it is to allow plenty of time for these pre-schoolers to experiment and explore and to feel comfortable clicking various options to see what is going to happen next. Providing children with minimal help teaches them they can operate the computer successfully. However, pre-school teachers may want to intervene when children appear frustrated or when nothing seems to be happening – just a word or two to remind the children what they need to do next to reach their desired goal. The teacher can ask probing questions or propose problems to enhance the children's computer experiences.

As children grow older, in preparation for primary school, computers can be used for more directed activities with specific learning objectives. There are many software packages in the market that allow children to compose a letter to a friend using a template provided, thus enhancing their language skills or explore the different types of animals or plants which life specimens are difficult to find. Through exploring computer experiences, these children build memory skills, learn how to seek out information, use knowledge until they have a clear understanding from multiple sources, and integrate their knowledge.

What is the earliest age at which computers can be introduced to children? This is a difficult question to answer accurately. Some researchers do not recommend that children under 3 years old use computers (e.g., Hohman, 1998) because computers simply do not match their learning style. The key is to see which stage of development the children are at. If they are the stage of learning to master skills such as crawling, walking, talking, and making friends, children should be given the chance to interact more with human beings and natural objects through their eyes, ears, mouths, hands, and legs.

With the advent of new technologies, certainly the nature of the concept of "toy" has changed considerably over the last decade. Now, the market is filled with electronic and digital toys to capture the hearts of children. Papert (1996, pp. 188) suggests that "our concern must be to ensure that what is good about play is at least preserved (and hopefully enhanced) as the concept of toy inevitably changes."

Examples of how IT can be used for Pre-schoolers

There are some people who advocate that computers are very suitable for pre-schoolers. This section describes the positive experiences of two such advocates. Thomas Pack (1998) shares how his three-year-old daughter played with and benefited from playing CD-ROMs:

The CD-ROMs my three-year-old daughter plays with, "Elmo's Pre-school" and "Ready for Math with Pooh", are two of the best examples of the edutainment genre. They combine instructional games with high-quality, storybook-style graphics, music, sound effects, and near movie-quality animation. They are truly educational, truly entertaining...

Both titles were created with a great deal of imagination, attention to detail, and an understanding of the power of the interactive learning environment CD-ROMs can provide. Developed by Creative Wonders, a California company that produces several other titles in the Sesame Street Games series, Elmo's Pre-school is designed for children ages 3-5. (My daughter has been using it mostly unassisted since she was a little over two.) The CD-ROM does not require any reading. Children will quickly figure out what to do by clicking on items

to see what happens or by listening to the Elmo character, who serves as a guide throughout the activities.

Pack describes "Elmo's Pre-school":

Elmo's Pre-school includes five rooms in which children can play games with letters, colours, shapes, and sounds. Each room allows freeplay (unstructured play) and offers two games. In the Face Treehouse, for example, children can enjoy freeplay by choosing from an assortment of noses, eyes, and mouths to create a customized Muppet. To play the Make a Face game, the child clicks a star and Elmo tells the youngster to make a face that looks happy, sad, mad, or scared. To play the How Would You Feel game, the child clicks a moon and Elmo says to make a face expressing how someone might feel in a particular situation.

What is so special about such software packages? Pack feels that:

One of the best features of the CD-ROM is how it responds to a child's answers. For example, if Elmo says, "Make a face that shows how you feel when nobody wants to play with you" and the child makes a happy face, Elmo will say, "That's not how I feel when nobody wants to play with me."

When appropriate, the games in Elmo's Pre-school have multiple skill levels. The software tracks answers and automatically moves children through more challenging activities when they're ready. Each activity also includes a graduated help system. Elmo will give the child clues when he or she seems to be having difficulty, and, if necessary, will solve a problem himself so the child can see how to do it...Children will not quickly tire of the CD-ROM, not only because of the

multiple games and skill levels but also because of the many extra features children find delightful.

Pack is full of praise about the educational value of the software:

Overall, Elmo's Pre-school is designed to teach not only educational skills such as number recognition, spelling, and critical thinking but also social skills such as empathy, sharing, and cooperation. The software includes a Parent's Guide with educator's notes on the programme, tips on playing with a child, a skill chart, and a personal certificate children can design and print.

Another advocate, Papert (1996), describes a CD-ROM entitled "My Make Believe Castle" in which children can play with digital characters that exist in a mythical computer micro-world. The play world contains all the essential ingredients of three-dimensional play scenes based in medieval times. The characters that can be chosen include a prince, princess, knight, dragon and wizard, and the context is a castle and its surrounds. These characters can assume identities defined by the players and so are different to traditional dolls whose "looks" are fixed. Papert suggests that such digital toys have more potential than traditional ones since they can adopt personalities that have been defined by the user, rather than the developer of the product. Moreover, such toys are transportable to a wide variety of digital worlds where the child may embark on new adventures, take risks and create new identities and stories that stimulate, excite and promote learning in a different dimension.

Potential Pitfalls in the usage of IT for the Singapore Pre-schooler

Although research and certain case studies have shown that it is possible to reap

benefits in using IT for pre-schoolers, I would like to discuss a few concerns that I have, which are potential pitfalls.

a. Replacing "real" with "virtual"

Because our children will be facing computers so much in the future, the fear is that they will soon lose the human touch and the touch of nature. The knowledge that they have will be built upon pseudo objects, virtual reality and touch buttons. Pre-school is a time when some of the most basic conceptualisations of the world around the child are formed. There is a danger that "real" is replaced so much by "virtual" that children grow up having the idea that some "virtual" things are actually "real".

Children grow up without seeing real animals but simply learn about them from virtual zoos on CD-ROMs. Instead of rolling in the mud and running on the field, children spent their childhood playing computer games and immersing themselves in a virtual world. If we think only of preparing them for an IT future, we may rob them of the good clean joy of childhood. It is therefore important we strike a good balance. For example, if we use musical software, we should try to let our children experience a variety of instruments in the real world along with their experiences in the electronic world. Let them hear music from a real instrument and feel the wood, strings and keys. Such experiences with "real" things are invaluable to their understanding of the world around them.

b. Children's literacy

One of the effects on using "too much IT" is on children's literacy. BBC News carried this story on their website on 4 March 2003. When a 13-year-old Scottish girl handed in an essay written in text message shorthand, she explained to her flabbergasted teacher that it was easier than the Standard English. She wrote: "My smmr hols wr CWOT. B4, we used 2go2 NY 2C my bro, his GF & thr 3 :- kids FTF. ILNY, it's a gr8 plc." (The translation: "My summer holidays were a complete waste of time. Before, we used to go to New York to see my brother, his girlfriend and their three screaming kids face to face. I love New York. It's a great place.") The girl's teacher was not impressed, saying: "I could not believe what I was seeing. The page was riddled with hieroglyphics, many of which I simply could not translate." (BBC News, 2003)

Many children start learning how to read and write at the pre-school level. Although the above story is about a teenager, if our pre-schoolers are clicking on mouse and typing on keyboard all the time, they may grow up to become this teenager. While it is true that the Net age has arrived for this generation of kids, we have to ask ourselves whether to suit the Net age, we should allow the standard of spelling and grammar to plummet to this degree of crisis. We must also ask ourselves whether in letting them play more with computers to prepare themselves for a computer age, we have allowed other basic types of learning for the children to be eroded.

c. Readiness of parents and pre-school teachers

Parents and pre-school teachers play a critical role in shaping how their children learn from computers. They are in control of what kind of access the child has to the computer and the types of software the child can run. They also determine to a large extent how productive and beneficial the child's time on the computer will be. They need to facilitate and monitor the child on the computer so that learning is really taking place. The question is whether parents and pre-school teachers have the requisite knowledge and skills. Cheung and Hu (2002, pp. 34) writes, "to make sure computer technology is used in an appropriate way to educate our young generation, teachers need to be trained in selecting computer hardware, software,

identifying the potential advantages and dangers of using the technology, and developing meaningful instructional activities to integrate the technology into our children's learning environment." But their research suggests that many pre-school teachers are not trained and are not ready to use IT in teaching pre-schoolers. The same probably goes for the parents. How can IT be profitably used for pre-schoolers when the adults are not sure how IT should be used?

Finding the appropriate role of IT for Pre-schoolers

The real challenge is therefore to find the appropriate role of IT for pre-schoolers in Singapore. At this moment, there is still no definitive answer. Nor is there a definite need for a definitive answer yet. Although IT can have a positive and useful role to play in the development of pre-schoolers, this role must be carefully circumscribed, as computers can be misused and cannot provide an all round experience base that is critical to a pre-schooler's development.

The position taken by the National Association for the Education for Young Children (1996) sums it up:

Computers supplement and do not replace highly valued childhood activities and materials, such as art, blocks, sand, water, books, exploration with writing materials, and dramatic play. In other words, the computer is an enrichment tool for enhancing readiness skills, problem solving and creative expression. It adds another dimension to concrete exploration and expression, like playing with sand, puzzles and crayons.

Developments in technology have moved with extreme speed over the past few years. In an era in which IT is fast becoming a way of life, a common mode of interaction, traditional activities can now be complemented with different experiences that have been made possible with the new information technologies. These technologies, and the activities that children may engage in with them, have the potential to extend learning in new and exciting ways. However, we have to be discerning about the potential benefits and pitfalls. In this way, we can truly facilitate the learning process and help children to make sense of their world in ways that are not hitherto possible.

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