Implications of Computer Use in Childhood Education

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Abstract

Introducing technology in childhood education is a controversial issue that has generated a heated debate among academics in the field. The opponents assert that potential risks of computers use in childhood education outweigh the promised benefits. The harms would affect social, physical and cognitive aspects of child development. The proponents contradict this negative view of computer use in childhood education. On the contrary, they claim, that computer use in childhood education can be beneficial if it is used appropriately. Like use of any other technology, the proper use could maximize the benefits and minimize the negatives. For the proponents, children develop better on social, cognitive and psychological domains with the use of computers. Generally speaking, research acknowledges the benefits of computer use in childhood education; however, it stresses its proper and appropriate use to make the best of promise of technology.

مضامين استخدام الحاسوب في تعليم الطفولة

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الملخص:

إدخــال التقنيــات في تعليــم الأطفال موضوع جدلــي، حيث أثار كثيـراً من النقاش في الأوســاط الأكاديميــة في هــذا الحقل، فالمعارضــون لاســتخدام التقنيات يدّعــون وجود مخاطر من اســتخدام الحاســوب في تعليم الأطفال تزيد عن المنافع، حيث هناك مخاطر اجتماعية، وجسمية، ومعرفية في تطـور النمو عنـد الأطفال. أما المدافعون فيعارضون وجهة النظر هـذه، وعلى العكس من ذلك يدّعون أن إدخال الحاســوب في تعليم الأطفال له منافع إذا اســتخدم بطريقة ســليمة مثله مثل استخدام أي تقنيـة أخرى، فالاسـتخدام الصحيح يعظم المنافع، ويقلل السـلبيات، وحسـب هـؤلاء المدافعين فإن الأطفال ينمون من ناحية اجتماعية ومعرفية ونفسـية أفضل باستخدام الحاسوب، وبشكل عام فإن البحث العلمي في هذا المضمار يقر بمنافع اسـتخدام الحاسوب في تعليم الأطفال، ويؤكد على حسن الاستخدام للحصول على أفضل النتائج، وتجنب سلبيات تقنية الحاسوب في تعليم الأطفال.

Introduction:

Children worldwide are being invaded by technology products from all walks of life, TV programs, video games and recently computer technology. As with any other technology, computer use in early childhood education has both dark side and bright side. Introducing technology in childhood education is a controversial issue and has generated much of a heated debate among academics in the field. The opponents argue that potential risks of computers use in childhood education outweigh the promised benefits. The harms would affect social, physical and cognitive aspects of child development. The proponents contradict this negative view of computer use in childhood education. Unlike others, they claim, that computer use in childhood education can be beneficial if used appropriately. Like use of any other technology, the proper use could maximize the benefits and minimize the negatives. For the proponents, children develop better on social, cognitive and psychological domains with the use of computers. Generally speaking, research acknowledges the benefits of computer use in childhood education, however, it stresses the proper and appropriate use to make the best out of technology.

A report published recently by Alliance for Children (Cordes & Miller, 2000) has generated a heated debate on introducing computers in childhood education. In spite of the promises for a brighter future made by computer advocates, the report warns that potential risks to children outweigh the promised benefits. Critics of computer use by young children in early childhood contend that technology has damaging effects on their physical, cognitive, social-emotional, and psychological development.

The risks to physical development include repetitive stress injuries, vision problems, lack of exercise and obesity, and possible exposure to harmful toxic emissions and electromagnetic radiation. Some experts argue that computers are not appropriate for young children.

Possible Cognitive development harms include decreased creativity and reduced imagination, impaired language and literacy skills, poor concentration and little patience for hard work.

Risks to emotional and social development include social isolation from peers and adults, decreased motivation, loneliness, depression, as well as potential exposure to pornography, violence, drugs, and race hatred via Internet access.

Yet, a wealth of literature contradicts this negative view of computer use in childhood education. The positive view argue that technology when used appropriately, can enhance child's learning opportunities for active engagement in the process, cooperative learning, frequent interaction and feedback, and a sense of connection to real-world contexts and applications. It has been found there were several advantages for computers in the areas of fine motor skills, language and communication, reading readiness skills, mathematical thinking, academic achievement, creativity, critical thinking, problem solving, self-concept, self-confidence, cooperation, motivation, and positive attitudes towards learning.

Purpose of the Study:

The purpose of this study was to explore the impact of computer technology in childhood education. Computer technology for the purpose of this study means the collection of computer hardware and software designed for use in education environment of children. The study sought to answer the following questions:

- How appropriate to introduce computers in early childhood education?

- Which role computers play to foster better and faster learning of children?

- How suitable to leave children work alone on computers?

- What are the benefits and hazards of computers on children?

Significance of the Study:

Childhood is a critical period in a human life characterized by rapid growth and development. Children are active participants in their own development, reflecting the intrinsic human drive to explore and master own environment. In addition to their remarkable linguistic and cognitive gains, children exhibit dramatic progress in their emotional, social, physical and moral capacities.

Jordan is embarking on ambitious program to improve its education system. Part of this program is to implement a huge inter-school infrastructure to support implementation of ICT in education. This study examines the implications of technology in early childhood education. Result and recommendations of the study are being made available to make the best of technology implementation in early childhood education in our program. Such knowledge can contribute to healthy childhood development in an expanding learning environment.

Discussion:

Early childhood represents a time of rapid growth and learning for children. During these years, children are curious to discover the world around them and eager to learn. They acquire the reading skills that prepare them for future schooling and life.

How appropriate to introduce computers in early childhood education?

Alliance for Children (Cordes & Miller, 2000) published a report which generated a much heated debate on introducing computers in childhood education. In spite of the promises for a brighter future made by computer advocates, the report warns that potential risks to children outweigh the promised benefits. Critics of computer use by young children in early childhood contend that technology has damaging effects on their physical, cognitive, social-emotional, and psychological development.

Intensive use of computers by adults is related to job stress and serious injuries. Putting emphasis on computers for children who have growing bodies are vulnerable to stress, and

could have serious health consequences to children. Unhealthy consequences could include sedentary lifestyle, obesity, visual strain, and risk for repetitive stress injuries. Other development injuries may include delays in children's ability to coordinate sensory impressions and movement as a result of being subjected to electromagnetic radiations. Moreover the ergonomic design of computer is made with adult users in mind and children may not adapt to the right position when using computers. Even college students have been complaining of computer-related pain, it was reported that students experiencing pain in their hands have started using computer since their childhood years. Such problems make it inappropriate to introduce computers to children education. (Cordes & Miller, 2000).

Critics claim that technology in schools wastes time, money, and childhood itself. They accuse computers of speeding up the pace of learning and cutting down on essential learning experiences. They warn that television, computers, and video games could never replace story-telling by the parents to the child, or even a collective game played by the family.

Critics argue that technology could hinder the proper interaction needed in child development. It isolates the child and cripples their imaginative growth. Children today prefer to stay home watching television and playing on the computer or video games rather than going outside and play police and robbers. This inhibits their use of imagination and growth of social skills. Sitting inside is not healthy for not getting the fresh air or the proper exercise their bodies need. Lack of exercise could bring these children obesity and its serious problems.

Judy Van Scoter and Suzie Boss found in their research that on a typical day two to seven-year olds used up eleven minutes on a computer, and over three hours watching television and videos contrary to well-established standards that limits screen time to a maximum of two hours a day for young children. (Scoter & Boss, 2002).

Even Bill Gates, chairman and CEO of Microsoft, confessed in a recent speech that he prefers printed paper to computer screens for extensive reading:

... Reading off the screen is still vastly inferior to reading off of paper. Even I, who have these expensive screens and fancy myself as a pioneer of this Web Lifestyle, when it comes to something over four or five pages, I print it out and I like to carry around with me and annotate. And it's quite a hurdle for technology to achieve to match that level of usability. (Darnton, 1999).

Contrary to negative view a number of studies have been carried and supported the use of computers in children education. Gimbert & Cristol claim that infusion of technology in childhood education has two folds, for it transforms teacher thinking and actions and, young children learn in meaningful ways. The positive impact will be long term on curriculum and teaching practice. (Gilbert & Cristol, 2004).

Judy Primavera et al in a study have indicated that computers are becoming indispensable in the homes of families with children. Computer penetration is raising and has increased from 48% to 70% between years 1996 and 2000 while Internet access has jumped from 15% to 58% in the same period. (Primavera, Wiederlight & DiGiacomo, 2001).

Jack Powell carried longitudinal study over ten years to investigate the relationship between computer use and achievement. Results of the study showed a positive statistical relationship between achievement and the use of computers in childhood education. (Powell, 1999).

These educators who support the use of technology in childhood education argue that the problem lies in the inappropriate use of technology rather than in the technology itself. Inappropriate uses of technology can hinder learning, for example, if children spend most of their time picking fonts and colors for multimedia reports instead of planning, writing, and revising their ideas. (Bransford; Brown & Cocking, 2000).

Anne Bednar, an educator at University of Eastern Michigan says "it is not the technology which is detrimental but its inappropriate use. In classrooms where technology is used appropriately with young children, the effects are very positive". (Bednar, 2004).

Acknowledging the benefits of technology in childhood education, Arizona State University West has embarked on a six-year program to fully integrated technology (100%) in its early childhood teacher preparation program. Results showed that graduates of this program were better equipped to use technology in their classrooms. This program shows that technology alone does not make things happen but dedication of people and time could make the difference. The change should start from teacher preparation who will guide children through their educational live. (Kelly; Wetzel; Padgett; Williams & Odom, 2004).

Researchers do not recommend use computers for children under three years old because computers do not match their learning style. Children younger than three are developmentally within preoperational stage of Piaget's development theory. Preoperational children are working on their mastery of language skills which is the building block for other future knowledge. Children at this age are extremely active, mobile and have difficulty sitting still; they are full of movement and change focus frequently. At this stage, children learn through their sensory receptors, eyes, ears, mouths, hands, and legs. Computers are not an appropriate choice for developing skills children are learning to manage, crawling, walking, talking, and making friends. (Haugland, 2000).

At age three to four years children are developmentally ready to start using computers. However, timing and support is crucial at this age. Children need to take their time and not to be rushed. Adult support should be there when children get frustrated or when nothing happens when they click several options. Children at this age who use computers, with other supporting activities, have significantly greater developmental gains in intelligence, nonverbal skills, structural knowledge, long-term memory, verbal skills, problem solving, and conceptual skills when compared to children gains without computer experiences in similar classroom settings. (Haugland, 2000).

In summary, introduction of computer in early childhood education is beneficial if brought in appropriately. It is critical to have children before three years of age on computers. Ergonomics of computer environment (desk, chair, keyboard, mouse & screens) need be adapted to the childhood development level. Integrating children protection from harmful

material should be an essential component in the education system. Teacher preparation should be carried out prior to the transition to computer aided education. Therefore we urge on proper planning of this fundamental change in childhood education prior to computer introduction.

Which role computers play to foster better and faster learning of children?

Nature has arranged human development in a timed sequence of gradual growth. According to Piaget's "genetic epistemology", theory children go through four primary cognitive structures: sensorimotor, preoperations, concrete operations, and formal operations. In the sensorimotor stage (0-2 years), intelligence takes the form of motor actions. In the preoperation period (3-7 years), the intelligence is intuitive in nature. The cognitive structure in later stages more logical and then develops abstract thinking. The Alliance for Children report, agues that thirty years of research on childhood education technology has produced no concrete evidence linking child's learning achievements to computer use in school. In fact, children prior to the operational period are still developing their sensory motor skills and computer use at this stage may be at odds with human biology and development psychology.

A counter argument claims that the nature of children's interactions appears to follow a developmental trend, which has implications for the social use of computers with children of different ages. Initially, their social exchange consists of an egocentric focus on turn taking. Gradually, they become more peer-oriented, offering to help and teach and finally, they are able to work collaboratively even without adult intervention.

Computers offer unique opportunities for learning. Computer activities when coupled with suitable off computer activities can yield the best results; they can augment and enhance hands-on activities but not replace them. It has been found that children exposed to development software showed gains in intelligence and nonverbal skills. Others who worked on both activities were improved in verbal, problem-solving and conceptual skill in addition to the aforementioned gains. Appropriate use of technology in the classroom must expand, enrich, individualize, differentiate, and extend the overall curriculum. The use of technology in childhood program must not be a goal unto itself. (Bowman; Donovan & Burns, 2001).

Computers can also benefit teachers by gaining knowledge into the child's thinking process while observing them on computers. These gains may take a yearlong to arrive at not after few months of observation. Moreover, ongoing long-term observation can guide us on the child's growth path. (Bowman et al., 2001).

As new technologies become more interactive, it is now easier to create environments in which students can learn by doing, receive feedback, and continually refine their understanding and build new knowledge. The concern of educators is that software developers are generally driven more by the game and play market than by the learning potential of their products. (Bransford, Brown & Cocking, 2000).

The US Federal Government has issued the "No Child Left Behind Act of 2001" for short

"NCLB". The Act urges schools, among other things, to introduce technology at all levels in teaching the young in order to prepare them for their own future and that of the nation as a whole. NCLB emphasized that children should read at the third grade and be technology literate by the eighth grade. (Department of Education-USA).

President George W. Bush commented on the use of technology by saying: "We cannot assume that our schools will naturally drift toward using technology effectively. We must commit ourselves to staying the course and making the changes necessary to reach our goals of educating every child. These are ambitious goals, but they are goals worthy of a great nation such as ours. Together, we can use technology to ensure that no child is left behind". (Patrick, 2004).

One Laptop per Child (OLPC) is a non-profit association founded recently by an MIT professor, Nicolas Negroponte, with a goal to provide a $100 laptop per child around the world to expand their learning experience. Negroponte quoted saying "It's an education project, not a laptop project". The OLPC advocates five core values: (1) child ownership; (2) low ages; (3) saturation; (4) connection; and (5) free and open source. The association founders and sponsors push for the introduction of computers in childhood education at early age of six years. (OLPC.org., 2007).

Contrary to critics, research pointed out that educational computers do not isolate children; in fact, they were catalytic agents for positive social interaction. It has been found that children spent nine times more talking positive to their peers while on computers than while doing puzzles. Moreover, they prefer to work with their peers rather than alone. Further, cooperation on a computer provides context for developing a sustainable interaction that can be transferred to play in other areas.

Further, working on a computer can bring about new forms of collaborative work such as helping or instructing, and discussing and building upon each others' ideas In one study, computers added a new dimension of participation, peer interaction, in which children developed a different sense of social relations, assisting each other and cooperating to solve problems and complete tasks. Computer activity was more effective in stimulating vocalization than toys in a regular preschool environment and evoked higher levels of social play. (Clements, 1995).

In summary, computers offer great opportunity for children learning. They foster collective attitude & team-working towards problem solving. More collaboration & interaction could develop among children while working in groups on computers. While on computer, children may exchange and play different roles; at one point a tutor role for helping others and at another point learner role getting help from others.

How suitable to leave children work alone on computers?

Vygotsky (1978) states:

"Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter-psychological) and then inside

the child (intra-psychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals". A second aspect of Vygotsky's theory is the idea that the potential for cognitive development depends upon the "zone of proximal development" (ZPD): a level of development attained when children engage in social behavior. Full development of the ZPD depends upon full social interaction. The range of skill that can be developed with adult guidance or peer collaboration exceeds what can be attained alone" (Theory into Practice (TIP) database, 2004).

Vygotsky's theory focuses on culture as a transmission medium from generation to the next generation. Tools of the culture used are language and social interaction. Working with adults and peers who are more skilled is essential for children to acquire the ways of thinking, knowing, and behaving that make up culture. Hence, knowledge is constructed through active and social interactions with others.

A number of studies were carried out on whether children can learn better alone on computers without adult support or if adult tutor in there to help the children. The results of these studies were in line with Vygotsky ZPD that the potential of education is expanded and benefit maximized if a tutor supported children on computer.

At University of Wisconsin-Whitewater, USA, a study has shown that it is inappropriate to have children work alone on computers without adult supervision and help. (Chang, 2001).

At Bar Ilan University, Israel, another study has shown that children education was better off on aspects of cognitive performance, abstract thinking and visual-motor coordination if adult teacher mediated their engagement in computer activity over their peer who used computer technology without adult observation. (Nir-Gal & Klein, 2004).

In summary, zone of proximal development at childhood is expanded with children working on computer supported by qualified adults. Therefore achieving higher benefits and enhancing education & learning experience.

What are the benefits and hazards of computers on children?

Computers are sophisticated machines designed for adult bodies and their mental capacities in mind. Adults who used them extensively on the jobs have suffered injuries related to computer usage. Nonetheless, no body can argue against the solid benefits that were gained from computers in both business and education. Children like adults can benefit from computers but how we get the maximum benefit and minimize the risks has been studied extensively by education research. It can be looked at the impact of computers on childhood education from three prospectives: Physical & Health, Emotional & Social, and Cognitive & Intellectual.

Physical & Health:

Children are growing and vulnerable bodies. Emphasizing the use of computers at this stage

could subject children several health problems that impact their proper physical development. Computers may distract families and schools from looking after children's true needs and may multiply their existing problems. Children may be placed at increased risk for repetitive stress injuries, visual strain, obesity, and other unhealthy consequences of a sedentary lifestyle.

Staying long time at a keyboard, constantly repeating a few fine hand movements, may hinder children's musculoskeletal normal development in hands, wrists, arms, and neck. It is almost impossible for children to follow the guidelines for healthy posture when using computers. The monitor is either too low, causing neck strain, or the keyboard too high for healthy arm, wrist, and hand posture. Computers are adult-sized tools and children have to adapt to them.

Long hours on a computer screen put children are at risk of visual fatigue. Encouraging computer in children education will force them to spend more time on the screen in addition to TV time. Constant focus on same distance, at same angle, inhibits blinking; eyes are open wider causing near-sightedness in childhood. Hedge recommends that children take a break from computer work every twenty minutes and spend no more than about forty-five minutes in any hour at a computer, and avoid spending more than four hours a day at computers and video games - including time spent both at home and school.

Health professionals believe that childhood obesity has increased since last decade. In addition to change in nutrition habits, electronic media was a main cause of obesity in children by diverting them from active playing to spending more time sitting in front of a screen at home and school. Diabetes, a serious, incurable disease associated with obesity was rarely diagnosed in childhood, is also now rapidly increasing among children. Obesity may cause children other chronic health problems as adults, such as high blood pressure and heart disease.

Results of a longitudinal medical study carried linked watching two or more hours of television a day in childhood and adolescence with serious long-term health risks. Researchers followed a thousand children from birth through young adulthood and found a strong correlation between screen watching and obesity, raised blood cholesterol, smoking, and poor cardiovascular health. (Hancox; Milne & Poulton, 2004).

Lack of exercise is bad for learning. Child development experts emphasize that moving in three-dimensional space stimulates both sensory and intellectual development. "...As a child learns to put movements in order, brain areas are primed to put words and ideas into a logical sequence. For example, some seemingly simple task such as hammering-a natural activity for young children- teaches complex scheduling of the exact..." (Healy, 1998).

Emotional & Social:

Developmental experts say that face-to-face interactions offer children the most emotionally maturing experiences. With the recent increase in purchase of home computers, and Internet connections to home, as well as school connections, children are likely to spend even less time interacting face-to-face with parents and friends. Even when teachers and students are together

in the classroom, they may be distracted from each other by the powerful new information technologies in their midst.

Instead of boosting the sense of community, highly computerized schools may actually weaken it, especially as Internet and e-mail options proliferate. The U.S. National Science Board in 1998 admitted that prolonged exposure of children to technology environment may harm children's emotional and psychological development in ways that would hardly build strong communities.

A study by the American Association of University Women Educational Foundation challenges the motivation claim computers in classroom learning. On the contrary, it found that computers bore many children-girls. In addition, many boys seem more interested in violent video games than educational software.

Computers can create addiction or obsession for children, which in turn hinder their other abilities. It has been reported in the media that some people spent more that three consecutive days continuously on an online game. The time children spend on computers in addition to that on televisions and video games, may contribute to developmental delays in children's ability to coordinate sensory impressions and movement and to make sense of the results.

The emphasis on connecting every child to the Internet raises a number of issues related to exposing children to a flood of commercial messages promoting everything from candy and electronic toys to pornography, violence, drugs, and race hatred. The impact of media and online material can be seen right away, such as when a child watches heroes' fighting and then copies their moves during play. For most of the time, the impact is not so immediate or obvious. It occurs slowly as children see and hear certain messages repeatedly, such as the following:

- Fighting and other violence used as a way to "handle" conflict.

- Cigarettes and alcohol shown as cool and attractive, not unhealthy and deadly.

- Sexual action with no negative results, such as disease or unintended pregnancy.

In fact, media and online material desensitize children. That is, make them tolerant to violence and exposure to explicit material. It is predicted that exposure to extensive or graphic portrayals and humorous portrayals of such material is of particular concern as a long-term effect for heavy viewers. Some of such material is programmed in children's animated series routinely, intended to be funny with the realistic consequences not shown. (American Academy of Pediatrics, 2005).

The US Federal Government enacted in December 2000 the "Children's Internet Protection Act (CIPA)" to protect children against violent and explicit online material. Under this Act schools must implement Internet Safety Policy to protect against access, through computers with Internet access, to visual depictions that are obscene, violence, child pornography, or harmful to minors. The school or library must also certify that it is enforcing the operation of such filtering or blocking technology during any use of such computers by minors. The Act

entitles schools to receive federal funds who are undertaking actions to put in place "Internet Safety Policy" and to procure the filtering or blocking technology.

The nature of the software used could selected could define the behavior outcome that children may display or internalize. It was found that drill-and-practice software tend to make students more isolated from each other, more competitive and more dependent on the teacher, while open-ended programs encouraged cooperative efforts. (Clements, 1995).

National Association for the Education of Young Children advocates the integration of computers into the learning environment as one option among others to augment children's social and cognitive abilities. However, it warns against using computers to replace other valuable learning tools. (NAEYC Position Statement, 1996).

Cognitive & Intellectual:

Computers, which are supposed to accelerate the pace of children's cognitive development, reflect the same mechanistic approach to education as a narrow focus on raising standardized test scores. Because all aspects of children's growth are so well integrated, however, the concentration on cognitive skills, narrowly conceived, actually can backfire. Failing to meet children's emotional and physical needs, as discussed above, can take a toll on academic learning as well.

Educational psychologist Jane Healy, a former school principal, notes that creativity involves the ability to generate "personal and original visual, physical, or auditory images - 'mind-images' in the words of one child". Nevertheless, she adds; "Teachers find that today's video-immersed children can't form original pictures in their mind or develop an imaginative representation. Teachers of young children lament the fact that many now have to be taught to play symbolically or pretend - previously a symptom only of mentally or emotionally disordered youngsters.

Some scientists suggest that popular simulation programs that many schools are using to teach biology and other subjects will dampen the natural, open-ended curiosity and creativity of children. They may lead students to passively accept that the programmed constraints of the simulations neatly capture what is actually a far more complex and less predictable reality. One physicist put it this way: "My concern is that we are tending to expose students to too many contrived, controlled versions of reality rather than nature as its raw, untidy self. If our schools' curricula included an hour of bird watching or rock collecting, or fossil hunting or astronomical observing for every hour spent in virtual reality, I could be content, but increasingly that seems not to be the case.

Computer use may also undermine the sense of wonder and reverence that young children typically bring to their encounters with the real world of rocks, bugs, and stargazing. Such wonder, especially if parents and teachers share in it, can powerfully motivate young learners in the healthiest way possible. Computers hamper the analytic, abstract thinking and make children appear more mechanistic than childlike.

Computers support and can activate multimedia communication: audio, visual and animation thereby enriching children learning and education experience. This comes in line with the multi-channel communication theory, which argues that humans have several communication channels to send and receive data. If information is presented by way of two or more of these channels, there will be additional reinforcement and consequently greater retention, thereby improving learning. (Bagui, 1998).

In summary, computers can create an environment of peer cooperation and social interaction, which can help extensive use of language. However, hazards are real and need be addressed properly prior and during introduction of computers in early childhood education. The hazards & harms include physical, health, emotional, cognitive and intellectual aspects of child development. Child Protection Laws need to address the proper exposure of children to computer technology and Internet otherwise, adverse effects may fire back on society in few generations. Nonetheless, computers and Internet provide a vast medium for expanding childhood education and learning experience.

Conclusion:

Children at this age group have tendency to engage in technological activity with an enthusiasm, curiosity and lack of inhibition that creates an optimum opportunity for development. The question is not whether technology fit in children's lives, but how to ensure that children get the benefit of the powerful learning opportunities without suffering its potential harms of the computer and Internet technology.

It is undeniable that Computer has invaded the childhood space without permission and children became technology oriented. This has made a pressure on educators from two angles, the first is to catch up with a fast evolving technology and the second is how to maximize the benefit while minimizing the potential harms. Research has indicated that teacher training and integrating computers in childhood education at appropriate time are essential to reap the benefits of technology.

It is recommended that in the course of integrating technology in childhood curriculum to take the following points:

* Develop a program continuous training for school teachers. This program must keep teacher with technology evolution. Technology mastery should be integrated in teacher evaluation and career development.

* Introduce the appropriate technology at the proper time. Children should be exposed to computers after three years of age. Computer environments should suits child's physical development needs.

* Integrate technology in classrooms not in separate lab to enhance children work on computers as part of education.

* Load computers with protection software to prevent access to inappropriate

material when children are online.

* Have adults with children to guide and provide help when needed. It is inappropriate to leave children alone on computers.

* Select appropriate software that encourage good social behavior and instigate children to build higher thinking processes.

* Use computers as tool to advance and add-on traditional learning not to replace it. It can create a framework of active motivating learning environments that are learner and knowledge centered.

* Make sure that children read well at grade three before they get deeply hocked on computers.

* Carry out quantitative studies to see where progress was made with computer and were improvements need to be done. Use holistic approach to take account of both impacts on children behavior and their learning experience.

Needless to say, computers offer great promise for better children education, but they pose a serious potential harm to children if not used appropriately or properly. Adult monitoring and discretion plays a key role in helping children attaining the goal of better education. Computers can be powerful pedagogical tool, rich source of information, and a context for extension of human capabilities into social interactions supporting learning.

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المجلة التربوية

مجلة فصلية، تخصصية، محكمة

تصدر عن مجلس النشر العلمي - جامعة الكويت

رئيس التحرير: أ. د. صالح عبدالله جاسم

تنشر:

◄ البحوث التربوية المحكمة

◄ مراجعات الكتب التربوية الحديثة

◄ محاضر الحوار التربوي

◄ التقارير عن المؤتمرات التربوية

◄ وملخصات الرسائل الجامعية

✿ تقبل البحوث باللغتين العربية والإنجليزية.

✿ تنشر لأساتذة التربية والمختصين بها من مختلف الأقطار العربية والدول الأجنبية.

الاشتراكات:

في الكويت: ثلاثة دنانير للأفراد، وخمسة عشر دينارًا للمؤسسات.

في الدول العربية: أربعة دنانير للأفراد، وخمسة عشر دينارًا للمؤسسات.

في الدول الأجنبية: خمسة عشر دولارًا للأفراد، وستون دولارًا للمؤسسات.

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